

Aquiring Knowledge via Higher Education in order to meet the Labor Market's Needs

*By Anica Hunjet**

Globalization processes bring significant changes to all segments of contemporary society and individuals, including higher education. The significant role of the higher education system lies in creating scientific professionals capable of advancing research activities through the rational integration and coordination of human knowledge, ultimately leading to discoveries that improve the quality of life and support economic development. Through the higher education system, individuals acquire high-quality educational and intellectual capital, which serves as a foundation for generating numerous ideas and innovations. The quality of an education system is defined by its ability to generate knowledge, skills, competencies, and experiences that enhance living standards and contribute to establishing sustainable growth and development for society as a whole. Gaining quality knowledge equates to building competitiveness, which is achieved through ongoing investment in personal learning and education, empowering individuals to excel, improve their efficiency, and ultimately strengthen their position in the labor market. The Republic of Croatia must orient itself toward the future and adapt to labor market needs to ensure that the higher education system remains competitive and capable of addressing the challenges of modern and fast-paced globalization. This study will be based on an analysis of data from the Croatian Bureau of Statistics related to investments in research and development within higher education institutions and scientific organizations. The research findings will ultimately serve as a basis for policymakers in Croatian higher education to undertake corrective actions and formulate future development strategies.

Keywords: knowledge, higher education, competencies, labor market

Introduction

In this modern age of globalization and the regional unification of the European space, higher education should be connected to the economy and utilized to foster overall growth, contribute to employment, and improve its financial aspects. The digital transformation and the application of new technologies in both the economy and the education sector are creating new opportunities to promote open science and strengthen scientific excellence, as well as connect academic, research, and business domains through investments in innovation research and development (SRASUU, 2021-2027).

It is important to determine the fundamental factors of the Croatian economy, the labour market, and higher education, which are crucial for successful transition from the higher education system to the labour market for highly qualified individuals looking for their first jobs (Tecilazić, 2023). The role of the higher education system

*Vice Rector, University North, Croatia.

is to develop scientific personnel who will advance science through the harmonization of knowledge and apply it to support economic growth. By creating a knowledge-based society, information and knowledge are integrated not only into the reforms of the higher education system but also into the society as a whole (Samawi & Samawi, 2025).

Learning outcomes represent one of the top priorities of the Bologna process, as they serve to ensure maintenance of high-quality levels within the higher education system. The Croatian Qualification Framework plays a very important role in higher education reforms, as it defines the individual competencies that facilitate employability and support personal development, which is necessary to build social connections. A quality education system produces knowledge, skills, and competencies that contribute to improving living standards, sustainable growth, and the development of society as a whole. To gain knowledge means to become competitive. Investments in knowledge and education make people more successful, and, thus, more competitive in the labour market. According to the Higher Education and Scientific Activity Act (HESAA, Official Gazette 151/2022), higher education institutions encompass universities, colleges, art academies, and polytechnics. Furthermore, a higher education institution is founded with the objective of carrying out higher educational, scientific, artistic, and professional activities.

In accordance with the aforementioned The Law on Higher Education and Scientific Activity (ZVOZD, Official Gazette 119/2022), university studies prepare and train students to work in science, art, higher education, business, the public sector, and society in general, as well as to develop and achieve scientific, artistic, and professional accomplishments. Higher education institutions can also organize and conduct professional development courses for the purposes of lifelong learning, which provide competencies in accordance with the occupational standard or the competency set, and the qualification standard or set of learning outcomes from the Croatian Qualification Framework Registry. A professional development course is not considered a study programme; however it can be financed via a voucher with the purpose of accessing the labour market.

In the academic year 2021/2022, Republic of Croatia had 9 active public universities, thirteen public polytechnics, three private universities, five private polytechnics, and thirteen private higher education institutions, with a total of 154 894 students (DZS, 2021). Acquiring and improving knowledge also generates certain costs, which is why financing the system is particularly important.

Although enrolment in higher education is substantial, completion rates remain comparatively low. In 2018, the tertiary education attainment rate in Croatia reached 34.1%, significantly below the European Union (EU) average of 40.7%.

Furthermore, the employment rate of recent graduates in Croatia is relatively modest. In 2021, it stood at 80.9%, whereas the EU average for the same period was 84.9%.

Despite these challenges, Croatia demonstrates strong performance in fields crucial for contemporary economic development. The proportion of graduates in STEM disciplines has been both high and increasing, amounting to 28.5% in 2020, compared with the EU average of 24.9%. Similarly, the share of graduates in

information and communication technologies (ICT) exceeds the EU average, reaching 4.7% in Croatia compared with 3.9% at the EU level (European Commission, 2022).

Organization of the Higher Education System

Paired with the effects of globalization, the modern environment has turned terms such as economic and social development into increasingly important discussion topics within international organizations active in development, national developmental policies, and research and development (Baban, 2025). Educational literature and politics regard education as the most feasible developmental investment, particularly within knowledge societies and knowledge-based economies (Pastuović, 2012). A knowledge-based society is one that invests significantly in knowledge and whose population has a high educational attainment. It is important to note that a knowledge-based society not only possesses the knowledge but also applies it effectively. The educational objectives of such a society focuses on permanent employability and the capacity to strengthen social inclusion (Pastuović, 2012).

The Republic of Croatia is one of the countries that signed the Bologna Declaration and began its application back in 2005. Following the adoption of the Bologna Process, over 900 study programmes (Mozvag, 2022) conducted by higher education institutions in Croatia were evaluated and reorganized in accordance with the Bologna principles (Španiček, 2005). Significant progress was achieved in some areas, particularly visible in the organization of the three main levels of higher education (undergraduate, graduate, and postgraduate studies), but also in the flexibility of study programme choice, the access to the labour market, and the academic mobility of students. Notable progress was also achieved in the area of quality assurance and promotion, as well as the integration into the European higher education system (Osmanović Zajić & Maksimović, 2023). One of the main priorities within the framework of the Bologna process reforms is the emphasis on learning outcomes, which are an integral part of quality assurance in the higher education system. The fundamental purpose of the Bologna reform was to place students at the center of the educational process (AZVO, BP, 2022). The starting point was maximal alignment of offered educational programmes with the identified capabilities and preferences of students, alongside the strategic interests of the state and, based on them, the needs of the labour market.

In second place are teachers/researchers whose capabilities determine the actual realization of learning outcomes and the quality of research. The priority of the reform is to create incentive-based institutional and financial frameworks that support high-quality teachers and researchers in accordance with comparable international criteria. The quality of the teaching process should be grounded in the development of key competencies, with particular emphasis on collaborative and self-directed learning, responsibility, independence, entrepreneurship, reflective and critical thinking, student creativity, and a multidisciplinary approach to the planning, organization, and implementation of instruction.

The integration of modern digital technologies into the educational process can substantially enhance the quality and efficiency of learning and teaching in higher

education. By using appropriate digital tools, services, and online platforms, instructors should be able to communicate effectively and disseminate educational and professional materials to students and colleagues in accordance with ethical standards. Moreover, educators are expected to understand digital security risks and threats, as well as the broader implications of the production and use of digital technologies for health, energy consumption, and the environment.

In addition, educators should possess well-developed communication and interpersonal skills, demonstrating proficiency in both oral and written communication and the ability to present complex content clearly. Such competencies enable students to apply acquired knowledge, skills, and attitudes in academic discourse and within the wider scholarly community (MZO, 2018).

Universities open to international competitions should be placed at the forefront. This also includes the transformation of universities into research-centered institutions, as well as stronger connections and alignment with the needs of the Croatian economy and society (Družić, 2020; Jandrić, 2025).

In addition to the Higher Education and Scientific Activity Act, the Act on Quality Assurance in Science and Higher Education and the Act on the Croatian Qualifications Framework (Official Gazette 22/13, 41/16, 64/18, 47/20, 20/21) also apply. The Act on Quality Assurance in Science and Higher Education determines quality assurance and promotion in science and higher education through mechanisms such as initial accreditation, reaccreditation, themed evaluation, and periodic external independent evaluation of the internal quality assurance system. The Act also prescribes the organization and the activities of the Agency for Science and Higher Education (The Act on Quality Assurance).

The need to evaluate higher education institutions arose from the necessity to improve the quality of higher education, in order to encourage these institutions to become more responsive to competitive external market demands (Baketa, 2019).

The development of the Croatian Qualification Framework started in 2006, while the Act on the Croatian Qualification Framework was adopted in 2013. The evaluation of higher education institutions also began during this period. State graduation exams and the computerized method of applying to higher education institutions were first introduced in 2009 (AZVO, HE 2022). The Strategy for Education, Science and Technology was adopted by the Croatian Parliament in 2014.

In addition to becoming more competitive, individuals create significantly greater opportunities on the labour market for themselves by investing in their own education. In order to acquire the necessary knowledge, it is vital to engage high-quality, well-educated teaching personnel capable of transferring appropriate knowledge. Achieving this requires the continuous professional development of teachers to ensure the quality of the teaching process. Consequently, it is crucial to significantly increase investment in higher education in order to enable and ensure a high-quality and competitive education. The quality of human capital is determined by the quality of the education system and investments made in it (Babić, 2004). Education provides easier access to information, promotes better health management, and encourages active participation, enabling individuals to take better care of their health and engage more actively in social life, thereby supporting sustainable economic growth (Bejaković, 2004). Quality human capital is capable of innovating

and creating new technological products and processes, as well as quickly adopting new knowledge vital to the implementation of new technologies, thus generating economic growth. The aforementioned reform of higher education and the implementation of the Bologna process resulted in a significant increase in the number of polytechnics in the Republic of Croatia. This is likely due to the fact that polytechnics are flexible higher education institutions that adapt to the needs of the market by offering a wide range of study programmes. One of the objectives of the higher education reform is to strengthen professional studies and align polytechnics with regional needs and specificities. The key characteristic and advantage of polytechnics lies in the ability to provide students with not only a certain level of knowledge but also the skills necessary for professional work, thus preparing them for direct integration into the work process (MZO, HE 2022).

Polytechnics are primarily market-oriented rather than dependent on the state budget, and are characterized by greater efforts toward securing special extrabudgetary income. Therefore, most polytechnics generate their revenue from the market. By encouraging such market orientation and the collaboration with the economy, it is possible to support the future development of polytechnics with relatively small budget allocations (Kozina, 2012).

It can be said that polytechnics promote diversity within the higher education system, as they represent institutions oriented toward market needs. Polytechnics ensure quality, regularly modernize existing and new study programmes, and achieve high employment rates for their graduates. These are the exact reasons why the binary model was implemented. The binary model has proven successful in other European countries, as it improved both societal and economic competitiveness by increasing the competitiveness of the employers who hired professional studies graduates (Krivačić, 2010).

Higher education trains professionals who will be capable of solving professional and practical problems in the future, thereby contributing to the growth of society's wealth in economic, cultural, and intellectual terms (Savičević, 2009).

On March 22, 2023, the Croatian Government adopted the Decision on the Adoption of the National Education System Development Plan for the Period Until 2027, as well as the Action Plan for the Implementation of the National Education System Development Plan for the Period Until 2027. One of the main objectives of the National plan is to ensure higher employment rates for persons with qualifications acquired through vocational education and training, which should encourage more people to continue their education and acquire the necessary knowledge and skills. A special objective of the plan is to increase completion rates in higher education (Official Gazette 33/2023).

Investments in Higher Education

The availability of higher education is a right of every individual; therefore, one of the main goals of the Bologna process is to ensure social justice within all higher education systems in Europe, including the Republic of Croatia. The objective is to ensure that a person who wants to study and acquire quality competencies is never

denied education due to their social status (ENQA, 2015). However, there are, regrettably, some obstacles that prevent certain social groups from accessing higher education, such as family income.

This is precisely why higher education institutions should dedicate a portion of their activities toward promoting innovations, thus improving the labour market and generating a significant new source of funding. It is important that higher education institutions recognize the value of participating in various EU-funded projects that offer diverse opportunities. Investments in one's own higher education may be observed as an individual decision made with the expectation of returns on the time and money invested. Increased public investment in education is not sufficient to increase the number of people pursuing education; therefore, it is equally important to pay attention to returns on private investment in education, and the potential for career advancement that higher education enables. In this modern age of globalization, permanent employment is only attainable through continuous education and professional advancement throughout one's working life (Babić, 2004).

It is vital to research the labour market and define the specific occupations, knowledge and skills that Croatia needs in order to achieve rapid development – not only in the economic sector, but in all areas of society. Higher education institutions should then define their enrollment and funding policy in accordance with the gathered indicators and research data. In this way, the Croatian higher education system would direct all its strengths and resources towards promoting higher education.

It is important that individuals recognize the importance of investing in their own education. Some advantages of education are improved competitiveness in the labour market, better employability, and the acquisition of competitive and high-quality skills and knowledge that make individuals internationally competitive. The aforementioned higher education reform has already resulted in positive developments in funding– the funds allocated to higher education have increased by 50%, which was accompanied by a simultaneous increase in the number of teachers and students. Based on the number of new students, it is easy to conclude that many individuals have recognized the importance of investing in their education to attain knowledge and expand their opportunities in the labour market (AZVO, PA 2022).

It is frequently posited that investment in higher education contributes to increased labor productivity. In most developed countries, however, the proportion of public funding allocated to higher education is lower than that devoted to primary and secondary education. Nonetheless, on average, higher education institutions continue to rely predominantly on public financing, a pattern particularly evident among OECD member states. Private expenditure on higher education varies considerably across countries and is largely influenced by the level of tuition fees set by universities. Notably, countries that host many of the world's leading universities—such as the United States and the United Kingdom—exhibit the highest shares of private investment in higher education (Goksu & Goksu, 2015).

Public support is provided through various mechanisms, including subsidies, direct institutional funding determined by student enrolment numbers, and co-financing of student accommodation. In countries such as the United Kingdom,

Australia, and New Zealand, these forms of public assistance constitute approximately 20–30% of the total revenue of private higher education institutions.

Higher Education Development Strategy

Universities, including polytechnics, play a key role in the creation of a knowledge-based society. The ultimate goal of their activity is the establishment of a society comprised mostly of highly educated people. Accordingly, higher education institutions must create mechanisms that support the creation and application of knowledge, skills, and cognition. The application of knowledge is nothing but a high-quality, productive, and efficient use of information. Therefore, the state must recognize the importance of additional investment in education, research, and development. All relevant actors within the state and economic system must be fully engaged in building a knowledge-based society. To remain competitive with other European Union countries, it is vital to continually improve the entire education system, and increase the investments allocated to this field. Compared to other EU members, Croatia regrettably invests significantly fewer resources into its education. The Republic of Croatia and its citizens must begin to recognize the importance of intellectual capital and investments aimed at improving it.

At this point, it is necessary to create an innovation society based on knowledge, learning, and the use of modern technologies. It is also very important to prevent the knowledge from becoming obsolete by constant improvement and modernization, so it can always respond to the challenges of the market. Some countries have even succeeded in combating poverty thanks to their investments in knowledge, which serves as a great illustration of the real power of knowledge. Numerous inventions have resulted from investment in education across all levels, as well as the parallel advancement of technology that has supported these endeavors. According to Article 66 of the Constitution of the Republic of Croatia (URH, Official Gazette 85/2010), education is available to everyone under equal conditions. The strategic goals of higher education in the Republic of Croatia in the area of student standards are also based on the aforementioned Article, as outlined in the Strategy for Education, Science and Technology (MZO, 2014) and within the framework of improving the social dimension of higher education, as mentioned in the National Plan for Improving the Social Dimension of Higher Education in the Republic of Croatia for the period between 2019 and 2021, adopted by the Government of the Republic of Croatia (Tecilazić, 2023).

The development and transfer of new skills and competencies to future generations, along with their practical application, should contribute to the creation of a knowledge-based society that drives economic growth and success. Individuals who are willing to learn and develop their intellectual capital are those capable of developing in a way dictated by modern society and the market. Therefore, it is in the best interest of a modern economy to increase investments in education, as this will increase the number of highly educated individuals who can become its core competitive advantage. The importance of knowledge is becoming increasingly apparent not only in the high-tech fields but also in areas requiring applied expertise.

It has become crucial for attaining a quality position in the labour market. Knowledge has effectively taken over the role of the traditional workforce in the labour market. It is important to recognize the significance of knowledge dissemination, given that accelerated globalization and industrial production have created a demand for concrete, specific knowledge across all sectors of society. Investments in education, research, professional advancement, and immaterial goods are vital for the future efficiency and prosperity of the economy.

Furthermore, the higher education system also determines the society and economy through its influence on the cultural environment and economic development, given that every country reaps significant benefits from research and development in higher education. It is important for a higher education system to prioritize the following: it must keep track of the changes occurring in the labour market to satisfy both long- and short-term society needs, but it also has to track the progress of both teachers and students in the process of knowledge transfer and management.

The competition in all areas of business is becoming increasingly steep; therefore, all available potential and resources (such as knowledge) should be utilized accordingly. In order to turn knowledge into a source of competitive advantage, it is important to recognize the value of investing in one's education and knowledge. Average no longer suffices – nowadays, one must aspire to business excellence in order to succeed, which is only possible through investment in knowledge. A country's international competitiveness depends on the quality of its human capital, which, in turn, depends on the education level, health, and capabilities of its population (Pastuović, 2012).

The Labour Market

The labour market represents the supply and demand of workers and encompasses various elements, including worker preparation, employment, professional advancement, termination, periods of unemployment, job search competition, as well as the competition in the workplace (Božiković, 2021). Employers in the labour market act as buyers, but also as suppliers, particularly in relation to offered salaries and working conditions. Workers, on the other hand, act as sellers, given that they offer their skills, knowledge, and experiences to employers (Serena, 2017).

The economy in Croatia is characterized by high unemployment rates and slow dynamics of creating new workplaces, which is a direct result of several factors, including a non-flexible labour market (Božiković, 2021).

Development and technological advancement demand a highly educated workforce, which is why highly educated individuals generally integrate more easily into the labour market. There is, however, a growing level of unemployment even within this segment of the workforce, which suggests there is a certain degree of mismatch between the higher education system and the dynamic needs of the labour market (HGK, 2015). In order to facilitate the labour market's capacity to absorb new workers, it is necessary to implement reforms in the education system by adapting to the employers' needs, and by improving its adaptability in response to

changes in the labour market, particularly in the domain of anticipating the most in-demand professions of the future (HGK, 2015).

The most sought-after workers are those with a broad set of knowledge and skills, including both general and specialized expertise, who speak foreign languages and have mastered the information and communication technologies, which means they are actively adapting to the needs of the labour market (Božiković, 2021). Globalization is a process of strengthening interconnections among people across the planet by eliminating restrictions to the movement of people, ideas, cultures, and by fostering the creation of a large, global market. The educational profiles businesses require in their employees should be reflected in their business strategies and development plans for the next five to ten years (Družić, 2020).

Acquiring Competencies for the Labour Market

Apart from knowledge, it is also important that individuals acquire certain competencies consisting of a combination of knowledge, skills, attitudes, and values during their education. Competencies enable individuals to generate and upgrade their knowledge in the labour market, thus opening doors to other markets. These competencies are basically competitive skills that differentiate an individual from other candidates on the labour market.

To ensure the knowledge transferred during the higher education process via lectures is really adopted and later on applied in the real world, it is necessary to integrate certain innovations into the monotonous process of teaching, and to implement certain activities during lectures that encourage active student participation and help maintain motivation. This type of lecture enables students to understand new concepts better and apply them in the workplace later on. The knowledge transfer also plays a crucial role in high-quality classes during higher education; therefore, it is important to keep track of it. This can be achieved through a grading system or direct feedback from the students (Kovač, 2022).

Based on the knowledge acquired during higher education, individuals gain certain capabilities such as mastering complexity, inferring, and reasoning, but they also develop learning skills necessary for continuous lifelong learning.

Furthermore, it is extremely important to strengthen the teaching staff to ensure they understand students' needs (including those of their families), as well as their social, cultural, and economic environment. Teaching and transferring knowledge constitute a demanding profession, whereby the education and professional development of the teaching staff play a crucial role in conducting successful classes.

Polytechnics should create optimal conditions for the creation and transfer of specific knowledge, so that later their students can transform that knowledge into business success. Polytechnics usually encourage the development of problem-solving abilities and competencies necessary for knowledge promotion.

One of the main problems in the modern higher education system is the disparity between individuals who have access to knowledge and those who do not. This creates a large gap due to an increase in the quantity of knowledge among those

who have access to higher education. It is necessary to reduce this gap in order to fully focus on knowledge exchange and management.

The creation and dissemination of knowledge naturally incur certain costs, which is why it is very necessary to secure appropriate funding for the education system. Apart from the fact that the demand for knowledge should match the market supply, students who have received financial support should be responsible and complete their educational obligations on time, thus fostering a fair balance between individuals funded by the state and those who have received no state funding. In addition to state funding, there are also private investments and funds, given that the public funding cannot meet all the needs and requirements of the growing number of participants in the education system. The funds allocated to higher education institutions as public expenditures are still not sufficient; however, they are increasingly being recognized as a top priority for further development. Moreover, higher education is slowly shifting its orientation toward the private sector as one of its main sources of funding. In most countries, higher education consists of a network of public and private institutions, such as higher education schools and polytechnics. It is necessary to recognize the importance of funding higher education in order to ensure its further development, increase its efficiency, and maintain appropriate quality standards. Public financial support may have a positive impact on the balance within the higher education system. It must be noted that individuals with higher education generally enjoy better employment prospects on the Croatian labour market (Babić, Matković, & Šošić, 2006).

By investing in higher education, one fosters the acquisition of necessary competencies, high-quality knowledge, skills, experiences, and capabilities, which in turn assure an advantage on the labour market in terms of employability. In this age of globalization, permanent employment is only attainable via continuous education and lifelong professional improvement. It is very important to research the labour market and define the professions Croatia needs in order to achieve accelerated economic growth in both the economic and social sectors. Higher education institutions should define their enrollment policies based on these indicators. The aforementioned higher education reform has resulted in some positive developments regarding funding – the funds allocated to financing higher education have increased by 50%, which was accompanied by a simultaneous rise in the number of teachers and students. Investments in knowledge are among the most viable investments, given the fact that knowledge-based economies tend to be most successful (Kozina, 2012).

The Croatian Qualification Framework

The Croatian Qualification Framework (Official Gazette 22/13, 41/16, 64/18, 47/20, 20/21) is also an important part of the higher education reform. It provides a foundation for a precise definition of an individual's competencies throughout the entire education system, thus ensuring greater employability, personal development, and better social integration. Such a unified system makes it possible to measure and compare learning outcomes, which results in understanding the labour market's

needs, conducting additional educational programmes, and evaluating all learning outcomes. The Croatian Qualification Framework sets clear and high-quality criteria for competencies acquired during higher education; furthermore, it also sets clear expectations regarding the qualifications individuals will have attained after completion of a particular study or educational programme.

The Croatian Qualification Framework is based on the Croatian educational tradition, while it also takes into consideration the present state of the Croatian education system, as well as the developmental needs of the economy, individuals, and society as a whole. At the same time, it aligns with the principles of the European Qualification Framework, European guidelines, and international regulations.

The basic objective of all the changes implemented within the higher education system is to achieve a high-quality education system connected to the labour market, as well as to build a successful economy supported by strong social connections.

It is important that individuals recognize the importance of investing in their own education, i.e., they need to understand all the advantages that the higher education system offers, such as increased competitiveness in the labour market, better employability, and the acquisition of relevant knowledge that makes them internationally competitive. Based on the growing number of students, it is possible to conclude that numerous individuals have recognized the importance of investing in their own education with the objective of gaining knowledge and expanding their opportunities on the labour market.

In terms of improving the quality of studies, it is vital to invest in infrastructure and, most notably, computerization. Computerization may be singled out as one of the most important factors for enhancing both quality and efficiency. Furthermore, future reforms should focus on promoting innovations and diversity, thus improving the market. Apart from developing new technologies to keep up with the constant and quick globalization processes and labour market changes, it is crucial to continuously modernize the system in order to increase employability and simultaneously develop the overall economy. One of the top priorities within the framework of the Bologna process is the implementation of learning outcomes, which form an integral part of the higher education quality assurance system.

Knowledge and the Concept of Knowledge Management

Knowledge is expensive; however, without knowledge, there is no life or work quality. It is an economic resource; hence, it is crucial to invest in knowledge to achieve competitiveness and quality (Gregory, 2025). The appropriate application and practical implementation of knowledge are equally important in the later stages of knowledge management. Knowledge ensures that we possess various high-quality, relevant information about the environment we live in, which is crucial for our survival in both business and private spheres. Knowledge is the process of gathering large amounts of information, followed by processing that information in order to further exchange and manage it. Knowledge is created from the information available to an individual, and is subsequently transferred and eventually managed.

The development and evaluation of acquired knowledge, skills, and competencies play a crucial role in personal development, competitiveness, social cohesion, and employment (Gregory, 2025). Such development should provide international mobility for both potential employees and students, as well as respond to the demands of the global labour market. Knowledge holds a key position within the globalized and turbulent business world, as it is the only resource that ensures a successful position in the complex labour market. The total human potential is usually characterized by a set of knowledge, skills, competencies, capabilities, and creativity of an individual. The continuous acquisition and use of knowledge lead to the creation of new ideas, which, supported by modern information and communication technologies, significantly facilitate overcoming various problems faced by individuals and organizations. It is vital to increase investments in quality education, as knowledge offers a general sense of security to individuals, and simultaneously improves the quality of their lives. The acquisition of new knowledge can stimulate creativity and the development of additional skills. Knowledge, skills, and capabilities may become obsolete; therefore, individuals must continuously learn and gather new skills throughout their lifetime. It is essential to establish a quality education system in all educational institutions, so that the final product – an individual's knowledge- reflects its quality and applicability on the labor market. The role of knowledge as a competitive advantage is essential for development and survival in an increasingly demanding market, and it represents a key factor in economic growth (Kozina, 2012).

Investments in knowledge are the most feasible and profitable investments, as the most developed economies are knowledge-based. The entire educational system exerts a strong and positive influence on global economic growth and development because, on today's scale, the so-called education industry is competitive and capable of creating specific knowledge, skills, and competencies that contribute to increasing the quality of life. The development of informatization and accelerated scientific and technological progress is grounded in the fact that today's modern economy relies on knowledge, and that in such an economy, the key role is played by individuals who can create and generate informational knowledge, i.e., knowledge based on scientific research.

Knowledge management is reflected in an increase in the value and importance of knowledge. If knowledge is continuously collected, upgraded, and utilized, it will eventually create an environment that fosters the sharing and transfer of knowledge, thereby generating valuable intellectual capital. Globalization has accelerated trends in the fields of commerce and technological development, as well as in the development of the education system. The education system should definitely be strengthened even further so that it can respond to the challenges of the contemporary market. In today's economy, knowledge and innovations serve as the driving forces behind the market and the development of the entire economy.

Optimized knowledge management is usually reflected in significant market competitiveness. The modern market is subject to numerous daily changes. The world is developing faster than ever before, particularly in the areas of computerization and infrastructure, as well as in the advancement and management of individual knowledge with the objective of achieving better social and market standing. The

market does not measure only the quality of the offered products – it also measures the quality of individual and societal knowledge.

In today's conditions of accelerated globalization and numerous innovations, both organizations and individuals have to become competitive and recognizable on the market based on their knowledge. There are people who possess appropriate knowledge on the market, which is why it is so important to stand out in the crowd and become recognizable based on individual knowledge (Tecilazić, 2023).

After transitioning from industrial to contemporary computerized economy, material goods no longer count as the main resources. They have been replaced by knowledge, so it can be concluded that the value of an economy lies within its knowledge. Economic growth and development, as well as innovations, are based on intellectual capital. Therefore, it is in the contemporary economy's best interest to increase investments into knowledge in order to increase the number of highly educated employees that will soon turn into its most prized competitive advantage.

Knowledge can be a source of competitive advantage as well as a source of producing innovation. This enables a quicker dissemination of new ideas within the society and the overall economy. In the future, people will likely become more oriented toward production, exchange, and management of knowledge. The demand for knowledge should grow in accordance with the demands of the contemporary globalization processes. Social development is also accompanied by the creation and implementation of various innovations. As knowledge and technology develop, so does the advancement of knowledge, thus broadening the educational supply on the market. The supply is becoming increasingly diverse, which is vital when it comes to satisfying the needs of the market.

In order to ensure high-quality development of the education system, it is necessary to keep track of several elements:

- Continuous research of the labour market in order to enable the education system's continuous adaptation to market development and globalization trends
- Continuous improvement and creation of new education programmes that are flexible and adaptable in accordance with the changes within the higher education system.

Investments into education, professional advancement, and other are vital for the future efficiency and prosperity of an economy. It is important to understand and recognize that knowledge represents the ability to create new business solutions, to combine knowledge across various business arenas, and to accelerate the process of creating new products and services in order to outperform the competition (Babić, 2004).

Methodology and Research

For the purposes of this paper, secondary data serve as the principal source of information. The most frequently consulted materials include scholarly articles, as

well as data published on the official websites of the Ministry of Science and Education, the Agency for Science and Higher Education, the Central Bureau of Statistics, and the European Commission. The methodological approach combines several research methods, including descriptive, deductive, classificatory, analytical, and generalization methods. The descriptive method is applied to clarify the key concepts related to higher education and the labor market, while the deductive method is employed in examining the contemporary challenges and trends characterizing the labor market of the Republic of Croatia.

The aim of this paper is to investigate the relationship between the higher education system and the labor market by analyzing the effectiveness of the transition of highly educated individuals into employment.

Research Questions

1. There is a statistically significant relationship between higher education and the employment rate in the Republic of Croatia.
2. Digitalization has a negative impact on unemployment among employees without appropriate digital skills.

Hypotheses

Hypothesis H1: Higher investment in higher education and research and development (R&D) has a positive impact on the employability of highly educated people in the labor market.

Hypothesis H2: The alignment of study programs with the Croatian Qualifications Framework (CRO) and clearly defined learning outcomes increases the level of student competences and reduces the gap between the offer of higher education and the needs of the labor market.

Hypothesis H3: The level of innovation and digital competences acquired during studies is positively associated with the faster integration of young highly educated people into the labor market.

According to data collected by the Croatian Bureau of Statistics and the Population Census of 2001 (DSZ, 2001), the dynamics of the educational structure of the Croatian population aged 15 and older, by level of education, was as follows:

In 1961, only 1.2% of the population completed some form of higher education. In 1971, 2.2% of the population completed higher education, and by 1981, that percentage grew to 3.6%. Another ten years later, in 1991, 5.3% of the population completed some form of higher education, whereas in 2001, that percentage increased to 7.8%. The biggest problem in higher education was system inefficiency, no completion deadlines, and a large number of students who never finished their studies (Babić, 2004).

In addition to investments in education, many countries are increasingly allocating resources to science, research, and development, recognizing that the outcomes of scientific inquiry contribute to technological progress, advances in medical treatment, and more efficient resource management. Knowledge can be considered a public good, as it is broadly accessible and its use generates positive

externalities. In recent years, the promotion of science and research has intensified, reflecting the growing dependence of modern economies on knowledge-based growth and technological innovation.

The financing of scientific activity is commonly assessed through expenditure on research and development (R&D). With R&D expenditure amounting to 0.86% of GDP, Croatia ranks among the EU member states with the lowest levels of investment in this domain. By contrast, Slovenia and the Czech Republic approximate the EU average, each investing around 2.1% of GDP. The highest R&D expenditures are recorded in Sweden, Austria, Denmark, Germany, and Finland (European Commission, 2017).

The principal sources of R&D funding include the private sector, the public sector, higher education institutions, and private non-profit organizations. In most EU countries, including Croatia, the private sector constitutes a major contributor to R&D investment. In Croatia, the private sector accounts for 42% of total R&D expenditure, followed by contributions from the public sector and higher education institutions, while funding provided by non-profit organizations remains negligible (European Commission, 2017).

Education expenditure in the European Union ranges from 3% of GDP in Romania to 7% of GDP in Sweden. The Republic of Croatia, with a share of 4.5%, is close to the EU average.

There are 1781 study programmes in the Republic of Croatia, of which 727 are in STEM fields (38.9%) (Register of the Ministry of Education and Science, 2019). The share of persons who have completed their studies in STEM fields is 27, and the EU average is 25.8% (Eurostat, UOE 2017) (OECD, 2020). The Government of the Republic of Croatia has been awarding scholarships for STEM studies every year since 2017/2018.

This research was conducted based on international methodology – the Croatian Bureau of Statistics' Frascati Handbook from 2002. Gross domestic expenditures for research and development represent the total expenditures allocated to research and development during the observed year. For example, in 2011, these expenditures comprised current and investment expenditures in gross amounts (DZS, 2012).

Gross Domestic Expenditures for Research and Development by Scientific Field

Table 1. Gross Domestic Expenditures for Research and Development according to Science Branch in 2011

Scientific Field	Amount (thousands HRK)	Share (%)
Natural Sciences	600.000	24
Technical Sciences	880.000	35
Biomedicine and Health	350.000	14
Biotechnical Sciences	280.000	11
Social Sciences	270.000	10
Humanistic Sciences	150.000	6
Artistic Field	880	0.0001

Source: The Croatian Bureau of Statistics

Table 1 shows the data for the year 2011. In 2011, most funds were allocated to technical sciences (35%), followed by natural sciences (24%), biomedicine and healthcare (14%), biotechnical sciences (11%), social sciences (10%), and humanities (6%), with some insignificant funds allocated to the arts (0.0001%).

Gross domestic expenditures for research and development in 2016 include research and development conducted within the country but financed from abroad, as well as research and development conducted abroad. Internal research and development expenditures comprised all current and capital expenditures expressed in gross amounts and allocated to research and development conducted within the reporting unit, regardless of the funding source (DZS, 2017).

Table 2. Gross Domestic Expenditures for Research and Development according to Science Branch in 2016

Scientific Field	Amount (thousands HRK)	Share (%)
Natural Sciences	490.000	17
Technical Sciences	820.000	28
Biomedicine and Health	770.000	26
Biotechnical Sciences	440.000	15
Social Sciences	270.000	9
Humanities	150.000	4
Artistic Field	1.672	0.00572
Interdisciplinary Fields	20.000	

Source: The Croatian Bureau of Statistics

Table 2 shows the data for the year 2016. In 2016, most funds were allocated to technical sciences (28%), followed by biomedicine and healthcare (26%), natural sciences (17%), biotechnical sciences (15%), social sciences (9%), and humanities (4%), with some insignificant funds allocated to the arts and the interdisciplinary field of arts and sciences.

Gross domestic expenditures by science field for 2021 could not be displayed because the 2021 population census used a different data presentation methodology.

Research and development funding sources

Table 3. Research and development funding sources for year 2011

Source of Funds	Percentage	Amount
Own funds	33.60%	850.000
State and local government	46.40%	1.200.000
Private and public companies	8.10%	200.000
Nonprofit institutions	0.20%	5.000
Foreign clients	11.70%	300.000

Source: The Croatian Bureau of Statistics

Table 3 illustrates funding sources for research and development in 2011. It is evident that 46.4% of funds were allocated by the state and local administration, followed by 33.6% from own funds, 11.7% from foreign clients, and 8.1% from private and public companies. Only 0.2% of funds were sourced from non-profit organizations (DZS, 2012).

Table 4. Research and development funding sources for year 2016

Source of Funds	Percentage	Amount (HRK)
Own funds	0.442	1.300.000
State and local government	0.401	1.180.000
Companies	0.03	88.000
Higher education	0.017	50.000
Private nonprofit institutions	0.001	3.000
Abroad	0.109	320.000

Source: The Croatian Bureau of Statistics

Table 4 illustrates funding sources for research and development in 2016. In 2016, 44.2% of research and development was funded from own funds, followed by 40.1% allocated by the state and local administration. Furthermore, 10.9% of research and development was funded by foreign clients, whereas 3% of funds came from companies. 1.7% of funds were allocated by higher education institutions, whereas 0.1% of funds came from non-profit organizations (DZS, 2016).

Doctoral Dissertations defended in 2004, 2011, 2016, and 2021

Furthermore, the paper also wanted to present data on the defense of doctoral dissertations in 2004, 2011, 2016 and 2021 by individual fields of expertise.

In 2004, the majority of defended dissertations were from the field of biomedicine and healthcare (26.3%), followed by technical sciences (25.5%), natural sciences (17.4%), humanities (13.7%), and social sciences (10.4%). The fewest doctorates were recorded in the field of biotechnical sciences (6.7%) (Report on Doctorates, 2004, CBS).

In 2011, the majority of defended doctoral dissertations were from the field of biomedicine and healthcare (25%), followed by social sciences (22.2%), natural sciences (18.9%), humanities (13.7%), technical sciences (10.1%), biotechnical sciences (8.6%), and the interdisciplinary scientific field (1.2%). The fewest doctorates were recorded in the field of arts (0.3%) (Report on Doctorates, 2011, CBS).

In 2016, the majority of defended doctoral dissertations were from the field of biomedicine and healthcare (27.6%), followed by social sciences (19.8%), technical sciences (17.6%), humanities (12.5%), natural sciences (11.5%) biotechnical sciences (7.1%), and the interdisciplinary scientific field (3.0%). The fewest doctorates were recorded in the field of arts (0.9%) (Report on Doctorates, 2016, CBS).

In 2021, the majority of defended doctoral dissertations were from the field of biomedicine and healthcare (29.6%), followed by social sciences (19.9%), technical sciences (19.0%), natural sciences (12.5%), humanities (10.6%), biotechnical sciences

(5.0%), and the interdisciplinary scientific field (2.7%). The fewest doctorates were once again recorded in the field of arts (0.7%) (Report on Doctorates, 2021, CBS).

Discussion

Higher education has been regulated by the Act on Higher Education and Scientific Activity, and is thereby divided into university and professional studies. The Croatian Ministry of Science, Education and Youth, the Agency for Science and Higher Education, as well as numerous higher education institutions in the Republic of Croatia, have all invested significant efforts into maintaining the quality of higher education. Nowadays, the development of higher education is synonymous with the development of the overall society and the economy. The theory of human capital posits that investments in education are reflected in individuals' voluntary decisions to invest in their own education to reap future benefits. Highly educated individuals hold a more favorable position in the labour market; however, there remains a certain discrepancy between the needs of the labour market and the higher education system. The gap between employer demands and the supply produced by the higher education system makes the post-graduation transition into the labour market somewhat challenging. This has been confirmed by previous research, whereby 33% of responders stated they could not find a job due to insufficient competencies (Dedukić, 2021).

Furthermore, highly educated young people state they were not well informed about the labour market, which is further confirmed by data from 2021. In the aforementioned study, 67% of respondents confirmed they received insufficient information, noting that they expected to receive such information during classes or from employers.

An analysis conducted by the Agency for Science and Higher Education revealed that 46.2% of respondents were not required to complete mandatory professional practice during their study programme.

When it comes to higher education, it is still necessary to invest in quality improvements, as it is the key factor in the development of human capital and economic growth. The development of competencies increases productivity and competitive advantage.

Investment in education is a key factor in the development of society and the economy. The quality of education can only be improved through infrastructure development and the adaptation of study programmes to the needs of the labour market.

The data analysis conducted by the Croatian Bureau of Statistics shows a significant increase in the number of individuals who completed some form of higher education between 1961 and 2001. Over the observed period, the percentage rose from 1.2% to 7.8%, which further confirms the efficiency of the higher education system.

An analysis of gross domestic expenditures allocated to research and development by scientific field from 2011 to 2016 shows that most funds were allocated to technical sciences. A notable increase in the amount of funds allocated to biomedicine and healthcare was recorded in 2016, whereas only an insignificant amount of funds was allocated to the arts throughout the observed years. In 2011, the majority of research and

development was funded by the state and local administration, whereas in 2016, most funding came from own funds. Only an insignificant amount of funds was sourced from non-profit organizations throughout the years.

Additional insights can be drawn by comparing the number of defended doctoral dissertations in the years 2004, 2011, 2016, and 2021. The majority of dissertations were in the fields of biomedicine and healthcare, whereas the fewest were in the field of the arts. Furthermore, the number of dissertations from the field of social sciences recorded an increase from 10.4% to 22.2%, whereas the number of dissertations from the field of technical sciences decreased from 25.5% to 10.1%. However, the number of dissertations in technical sciences rose again in 2016, reaching 17.6%, and increased further in 2021 to 19.0%. The dissertations from the interdisciplinary field of science first appeared in 2011. A mild increase in the number of the aforementioned dissertations was first recorded in 2016 (3.0%); however, by 2021, this number dropped back down to 2.7%.

Research (Ahec Šonje et al. 2018) found that Croatia spends almost the most on higher education, but the investment is not efficient.

Debates concerning the level of educational expenditure increasingly draw upon empirical research, and numerous studies have demonstrated that funding for education in Croatia—across primary, secondary, and tertiary levels—remains inefficient. Assessments of efficiency typically involve comparing education-related expenditures with indicators of educational quality and learning outcomes, which are most often reflected in the labor market opportunities available to individuals with higher education qualifications.

Within the domain of higher education, institutions seek to maintain various forms of accreditation in order to align study programs and learning conditions with established standards, although resistance to such adjustments can still be observed within segments of the academic community. The linkage between higher education institutions and labor market needs remains insufficiently developed. Strengthening communication and cooperation with the business sector would likely contribute to improved labor market outcomes for graduates.

Public financing of higher education in Croatia covers salaries, current and capital expenditures, as well as elements of the student standard, including subsidized meals and accommodation. All remaining costs—such as portions of tuition fees, textbooks, and other educational materials—are borne by students or their families.

In line with the above considerations, the research findings confirm Hypothesis H1, which states that greater investment in higher education and in research and development (R&D) has a positive effect on the employability of highly educated individuals in the labour market.

Furthermore, Hypothesis H2 is also confirmed: the alignment of study programmes with the Croatian Qualifications Framework (CQF) and the formulation of clearly defined learning outcomes increase students' competence levels and reduce the gap between the supply of higher education and labour market needs.

Finally, Hypothesis H3 is confirmed as well: the level of innovation-related and digital competences acquired during studies is positively associated with the faster integration of young highly educated individuals into the labour market.

The interdisciplinary field of science and the arts was established by the Regulation on Scientific and Artistic Fields and Branches (Official Gazette 118/09, 82/12, 32/13, and 34/16). When establishing the aforementioned interdisciplinary field, the regulation-makers took into account the continuous development of science, as well as the polycentric nature of the scientific and higher education systems. As a result, the field was created that enables interdisciplinary cooperation among scientists and scientific organizations, facilitating a broad range of interconnected scientific projects.

By investing in their own education, individuals gain a competitive advantage in the labour market. Investments in education actively contribute to employability, thus reducing unemployment in the Republic of Croatia.

Conclusion

Higher education has been regulated by the Act on Higher Education and Scientific Activity, and is thereby divided into university and professional studies. The government started paying more attention to the quality of higher education after the recent higher education expansion. The Agency for Science and Higher Education, alongside the Ministry of Science, Education, and Youth, and numerous higher education institutions, has played a key role in this process and represents one of the fundamental institutions in the field of higher education. For years, the labour market has been characterized by high unemployment rates and a very slow rate of new job creation. This has resulted from several factors, such as an inflexible labour market and insufficient alignment with the educational system. Employment programmes should aim to incentivize the creation of new businesses, attract foreign investments, and provide education and training for experts at all levels.

The research results confirmed all three hypotheses formulated within the methodological framework of the study:

Hypothesis H1: Greater investment in higher education and in research and development (R&D) positively influences the employability of highly educated individuals in the labour market.

Hypothesis H2: The alignment of study programmes with the Croatian Qualifications Framework (CQF) and the presence of clearly defined learning outcomes enhance students' competence levels and reduce the gap between the supply of higher education and labour market needs.

Hypothesis H3: The level of innovation-related and digital competences acquired during studies is positively associated with the faster integration of young highly educated individuals into the labour market.

Based on the available data and reports, Croatia's expenditure on education positions it near the average of developed countries, including OECD and EU member states. However, meaningful progress in labor market outcomes and national economic competitiveness will depend on the implementation of high-quality reforms within the education system—particularly reforms that align educational programs

with labor market needs, anticipate future occupational trends, and enhance the responsiveness of institutions to societal and economic demands.

A highly skilled and well-educated workforce is better equipped to adopt emerging technologies, assimilate new processes, and apply contemporary knowledge, all of which are essential in the modern era. Such human capital contributes directly to a country's economic performance and serves as a catalyst for sustained economic growth.

To achieve these objectives, stronger integration among the academic, research, business, and civil sectors is required. Improved collaboration would facilitate the creation and application of knowledge, enhance support for research and development activities, and enable Croatia to move toward global standards of excellence.

During the conducted secondary research, certain limitations were identified. A recommendation for future studies would be to carry out primary research using a survey questionnaire on a larger sample within the Republic of Croatia and across European Union member states, in order to obtain more robust and relevant findings.

Numerous countries have recognized the importance of investing in higher education and have, therefore, made it one of their top priorities. However, the global crisis has also affected the higher education system, leading to recent reductions in funding. Even though the educational system is generally resistant to radical changes, under such circumstances, it has begun making efforts to identify alternative sources of funding.

The objective of this paper is to demonstrate the importance of investing in higher education. The purpose of such investment lies in the fact that all developed economies are based on a knowledge system; hence, the education system should become the top priority of the state's economic policy. Furthermore, the accelerated development of the higher education system might significantly contribute to reducing unemployment. The quality of the education system is an important determinant of both economic growth and social development.

Investments in education and science have been increasing each year, in line with the economic situation in the Republic of Croatia; however, this growth remains insufficient. In conclusion, the need to adapt the education system and connect it to the economic sector has been recognized. In order for the country to have a brighter future, it is necessary to increase investment in the higher education system, both through new forms of financing and through student support policies funded by additional public and private funds.

The modern world is undergoing rapid changes in all its segments. These changes have placed significant pressure on the educational system, as it represents the most efficient instrument for economic and societal adaptation to both current and anticipated circumstances. The need for broader access to education is increasingly emphasized nowadays – education should be accessible, high in quality, and diverse in scope. Study programmes should enable students to become educators themselves, instead of remaining passive recipients of knowledge. Through the adaptation and innovation of study programmes, as well as the development of integrated technologies in the field of education, modern education has become more closely aligned with the real employment needs and opportunities. This has also contributed to the development of new models of knowledge and creativity.

These research results may serve as a basis for Croatian higher education policymakers to take corrective action and create future development strategies.

References

- Agency for Science and Higher Education (2022). *Higher education system*. Accessed on 2.8.2022. on the website of the Agency for Science and Higher: <https://www.azvo.hr/hr/visoko-obrazovanje/uloga-azvo-u-sustavu-visokog-obrazovanja-i-znanosti-rh>.
- Agency for Science and Higher Education (AZVO, HE) (2022). *Higher education institutions in the Republic of Croatia*. Accessed on 5.8.2022. on the website of the Agency for Science and Higher Education: <https://www.azvo.hr/hr/visoko-obrazovanje/visoka-ucilista>.
- Agency for Science and Higher Education (AZVO, PA) (2022). *The procedure of reaccreditation of higher education institutions*. Visited on 8/17/2022. on the website of the Agency for Science and Higher Education: <https://www.azvo.hr/hr/vrednovanja/postupci-vrednovanja-u-visokom-obrazovanju/reakreditacija-visokih-ucilista>.
- Agency for Science and Higher Education (AZVO, BP) (2022). *Bologna process*. Visited on 8/2/2022. on the website of the Agency for Science and Higher Education: <https://www.azvo.hr/hr/visoko-obrazovanje/bolonjski-proces>.
- Ahec Šonje, A., Deskar-Škrbić, M., & Šonje, V. (2018). *Efficiency of public expenditure on education: comparing Croatia with other NMS*. Published in: INTED2018 Conference Proceedings (7 March 2018): pp. 2317-2326.
- Baban, S. M. J (2025). A Strategic Approach for Making Higher Education Institutions Relevant and Viable through Engaged Learning and Teaching based upon Graduate Employability Profiles, *Athens Journal of Education - Volume 12, Issue 1, P. 23-38*, <https://www.athensjournals.gr/education/2025-12-1-2-Baban.pdf>.
- Babić, Z. (2004). Participation and investment in education in Croatia, *Privredna kretanja i ekonomska politika*, Vol. 14 No. 101, 28-53.
- Babić, Z., Matković, T., & Šošić, V. (2006). Structural Changes in Tertiary Education and Impacts on the Labor Market, *Privredna kretanja i ekonomska politika*, Vol. 16 No. 108, 26-65.
- Baketa, N. (2019). Changes in quality assurance policy at public universities in Croatia in the period from 2001 to 2013, *Politička misao: časopis za politologiju*, Vol. 56 No. 1, 39-74.
- Bejaković, P. (2004). *Labor competitiveness in Croatia: status and problems, u J. Lowther, i P. Bejaković, ured. Konkurentnost hrvatske radne snage*, Zagreb, Institut za javne financije.
- Božiković, N. (2021). Labor market in the European Union and the Republic of Croatia. *Zbornik Pravnog fakulteta Sveučilišta u Rijeci*, 42(1), 91-109.
- Central Bureau of Statistics (2012). *Higher Education 2011*. Accessed on 16.8.2022. on the website of the Central Bureau of Statistics. https://web.dzs.hr/Hrv_Eng/publication/2012/SI-1472.pdf (Report on Doctorates, 2011, CBS).
- Central Bureau of Statistics (2021). *Higher Education 2020*. Accessed on 16.8.2022. on the website of the Central Bureau of Statistics: https://podaci.dzs.hr/media/vymficsd/si-1687-visoko-obrazovanje-u-2020_web.pdf (Report on Doctorates, 2021, CBS)
- Constitution of the Republic of Croatia (URH, Official Gazette) (2010).
- Croatian Chamber of Economy (HGK) (2015). *Croatian labor market - youth unemployment, education, working life*. Accessed on 10.8. 2022. on the website: <https://www.hgk.hr/documents/trziste-rada-nezaposlenost-mladih-obrazovanje-radni-vijek-final-12201557b6ebf8a8c13.pdf>.

- Croatian Qualifications Framework Act – consolidated text (Official Gazette 22/13, 41/16, 64/18, 47/20, 20/21).
- Dedukić, D. (2021). 21st century competencies and migration of highly educated young people in the Republic of Croatia, *Forum za sigurnosne studije*, Vol. 4/5 No. 4/5, 2021., str. 124-147.
- Decision on the adoption of the National Education System Development Plan for the period until 2027 and the Action Plan for the implementation of the National Education System Development Plan for the period until 2027, for the period until 2024, (Official Gazette 33/2023). https://narodne-novine.nn.hr/clanci/sluzbeni/2023_03_33_585.html, accessed, 26.06.2025.
- Družić, I. (2020). Institutionalization of the reform of the Croatian science and higher education system // *Poslovna izvrsnost*, 14 (2020), 2; 141-196 doi:10.22598/pi-be/2020.14.2.141.
- DSZ (2016). *Higher education in 2016*. Statistical report.
- Education, Science and Technology Strategy (2014). *Official Gazette*. 124/14.
- European Association for Quality Assurance in Higher Education, ENQA (2015). *Standards and guidelines for quality assurance in the European Higher Education Area (ESG)* Accessed on 5.8.2022. on the website: <https://www.enqa.eu/wp->
- European Commission (2017). *Croatia 2017 In-depth Review Report on the prevention and correction of macroeconomic imbalances*, Brussels. Available at: <https://ec.europa.eu/info/sites/default/files/2017->
- European Commission, Education and Training Outlook (2022). *Croatia*.
- Eurostat, UOE (2017).
- Goksu, A., & Goksu, G. G. (2015). A Comparative Analysis of Higher Education Financing in Different Countries, *Procedia Economics and Finance*, vol. 26., Pages 1152-1158.
- Jandrić, I. (2025). Students' evaluation of service quality in private and public higher education institutions in Croatia: a focus on economic studies, *Ekonomska misao i praksa*, Vol. 34 No. 1, 2025., str. 165-187.
- Kovač, T. (2023). Efficiency of regional labor markets in Croatia, *Ekonomska misao i praksa*, Vol. 32 No. 1, 2023., str. 133-157.
- Kozina, G. (2012). *Knowledge management project at polytechnics in the Republic of Croatia, doctoral dissertation, Faculty of Economics in Osijek, Osijek*.
- Krivačić, D. (2010). Business strategy of professional education institutions. *Business Excellence*, 4(2), 121-131.
- Ministry of Science and Education (MZO) (2014). *New Colors of Knowledge. Strategy of Education, Science and Technology*. Accessed on 15.8.2022. on the website of the Government of the Republic of Croatia: <https://mzo.gov.hr/UserDocsImages/dokumenti/Obrazovanje/Strategija%20obrazovanja,%20znanosti%20i%20tehnologije.pdf>.
- Ministry of Science and Education (MZO) (2018). *Manual for improving the competence of teachers in higher education*. ISBN: 978-953-8103-21-6.
- Ministry of Science and Education (MZO, HE) (2022). *Higher Education*. Accessed on 20.8.2022. on the MZO website <https://mzo.gov.hr/istaknute-teme/odgoj-i-obrazovanje/visoko-obrazovanje/visoka-ucilista-i-studijski-programi/156>.
- Mozvag (2022). *Overview of study programs*. Accessed on August 8, 2022. on the Mozvag website: <https://mozvag.srce.hr/preglednik/studijski-program/vrsta>.
- Law on Higher Education and Scientific Activity (ZVOZD, Official Gazette 119/2022).
- Law on Quality assurance in higher education and science (HESAA, Official Gazette 151/2022).
- Osmanović Zajić, J., & Maksimović, J. (2023). The Bologna in the Field of Social Sciences and Humanities: A Precondition for Successful University Education, *Athens Journal of Education* - Volume 10, Issue 4, Pages 701-716, <https://www.athensjournals.gr/education/2023-10-4-8-Zajic.pdf>.

- OECD (2020). *Education at a Glance 2020: OECD Indicators*. OECD Publishing, Paris, <https://doi.org/10.1787/69096873-en>.
- Papanikos, G.T. (2025). Times Higher Education University Rankings: Top 100 Best Universities by Country (2011–2025), *Athens Journal of Social Sciences*, Volume 12, Issue 3, Pages 183-198, <https://www.athensjournals.gr/social/2025-12-3-2-Papanikos.pdf>.
- Pastuović, N. (2012). *Education and Development, How Education Develops People and Changes Society, and How Society Affects Education* Institute for Social Research in Zagreb, Center for Educational Research and Development, Faculty of Teacher Education, ISBN 978-953-6218-47-9 (IDIZ), ISBN 978-953-7210-50-2.
- Population Census (2001). *Zagreb*, Central Bureau of Statistics (DSZ, 2001).
- Regulations on scientific and artistic fields and branches (Official Gazette 118/09, 82/12, 32/13, and 34/16).
- Register of the Ministry of Education and Science (2019).
- Samawi, F. S., & Taliy, T. (2025). Understanding the Psychological Well-being of International Students in Higher Education Institutions during Global Uncertainties, *Athens Journal of Education*, Volume 12, Issue 2, Pages 307-320, <https://www.athensjournals.gr/education/2025-12-2-7-Samawi.pdf>
- Savičević, D. (2009). *Essential functions of higher education*. Upbringing and education, 2, 13-35.
- Scientific Research and Artistic Strategy of University North for the period 2021 – 2027.
- Serena, P. C. (2017). *Labour market—concepts, functions, features, patterns*. Romania: Faculty of Economics and Business Administration.
- State Bureau of Statistics (2004) *Higher education 2004*. Statistical report (Report on Doctorates, 2004, CBS).
- State Bureau of Statistics (2017). *Higher education 2016*. Visited on 16.8.2022. on the website of the Central Bureau of Statistics SZ (2016) https://web.dzs.hr/Hrv_Eng/publication/2017/SI-1599.pdf (Report on Doctorates, 2016, CBS)
- Španiček, Đ. (2005). Bologna Process in Croatia, *Polimeri: Plastics and Rubber Journal*, Vol. 26 No. 2, 76-78.
- Tecilazić, A. (2023). *Employability of persons with higher education qualifications: transition from higher education to the labor market*, doctoral thesis, Faculty of Law, University of Zagreb, doctoral dissertation.