

DIGITAL TRANSFORMATION OF THE GLOBAL EDUCATION MARKET

Liudmyla Tsymbal¹, Iryna Kalenyuk²

Abstract. The global education market is undergoing significant changes due to modern digitalisation. The latest technologies are significantly changing learning technologies, the structure of education, international flows and their volume in general. The *subject* of the study is to assess the impact of digital transformation on the global world market. The *aim* of this article is to analyse the development processes of the global market for educational services in the context of modern challenges, in particular digital transformation, and its consequences for the higher education market. The *methodology* of the study included research, a review of scientific literature, graphic visualisation of digitalisation. The methods of system analysis and generalisation have made it possible to identify the main directions of transformation of the global and regional educational markets, to characterise the dynamics of the spread of the latest forms of education and the growth of their profitability, to confirm the turbulence and instability of internationalisation trends and the intensification of competition between traditional and new providers of educational services. Research has shown that the online education sector is developing and expanding rapidly. The amount of capital raised and its profitability are increasing, confirming the prospects of these investments. There is a growing variety of online education providers, which generally creates significant competition for traditional institutions such as universities. Educational products are becoming more diversified and there is a growing trend towards personalised and adaptive learning on online educational platforms using artificial intelligence and machine learning technologies. In recent years, there has been a significant increase in the number of students enrolled in various online courses, and there is a growing demand for distance learning and flexible, personalised learning options. The global education market is characterised by unstable dynamics of internationalisation due to various external factors such as the COVID-19 pandemic, military aggression, demographic factors, political and economic instability. Competition between traditional and new providers for students, market share and financial resources is intensifying. In general, despite the negative factors, the number of foreign students tends to increase, albeit rather unevenly across countries. The widespread use of ICT in education and other activities can pose potential threats and challenges: increased competition and lower quality of education, spread of unwanted and anti-social information.

Key words: EdTech, educational platforms, internationalisation, international students.

JEL Classification: F21, I122, I125

1. Introduction

The global market for educational services is undergoing profound changes in the current phase of global development. On the one hand, there is no doubt that education is becoming increasingly important for both social and personal development. On the other hand, new factors are emerging that have a significant impact on learning technologies, the structure of education, international flows and their volume in general. The COVID-19 pandemic

has triggered changes in key teaching methods and technologies, as the need to ensure the independence of the educational process from physical location has become urgent. Modern state-of-the-art technologies have made it possible to create a technological basis for such a learning process.

Overall, the development of the global education market is highly turbulent. It is undergoing a large-scale digital transformation, which is making it possible to overcome all difficulties and create a new technological

¹ Kyiv National Economic University named after Vadym Hetman, Ukraine
E-mail: ltymbal@ukr.net

ORCID: <https://orcid.org/0000-0002-0873-9227>

² Kyiv National Economic University named after Vadym Hetman, Ukraine (*corresponding author*)

E-mail: [kalenyuk@ukr.net](mailto:kalenuk@ukr.net)

ORCID: <https://orcid.org/0000-0003-1807-2849>



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basis for the development of education. The growing importance of educational services in the context of labour market transformation is becoming global, leading to the emergence of diversified educational products. The processes of internationalisation of education are characterised by highly controversial trends. The pandemic has slowed, but not stopped, the growth of internationalisation. Instead, new forms of internationalisation have emerged, and ICTs have become important in this process. International migration flows, including students, have increased significantly.

2. Literature review

An urgent problem in modern scientific research is the study of trends in the development of the higher education system, which is characterised by high turbulence and instability. Leading researchers of these problems include Ph. Altbach, X. Wan & Hans de Witt among the main trends: COVID-19, the climate crisis, global inflation, economic challenges (Philip G. Altbach, Xiaofeng Wan, Hans de Wit, 2022). At the same time, large-scale digitalisation is an equally defining trend of today, leading to dramatic changes in all areas of activity, including education. Today's realities include the spread of ICT in education, virtualisation and platformisation of the educational services market, the emergence of new providers, the spread of new forms and technologies of education, etc. These processes influence internationalisation processes and the formation of regional centres of attraction for foreign students, increase competition in the global education market, and encourage universities to become more active and adapt to new conditions. These processes are studied by the following researchers Ph. Altbach, H. de Wit, L. Antoniuk, O. Kuklin (Kuklin at al., 2023), Y. Sharma (Sharma, 2012), M. Burns (Burns, 2021), Lee Del Col, Garth Stahl (Lee Del Col at al., 2023), C. A. González, J. D. Luksic, N. Navarrete (González at al., 2023), J.D. Rocky, A. Abdimomynova (Rocky at al., 2023) and others. At the same time, modern reality brings new challenges and processes that require research and generalisation.

The purpose of the article is to analyse the processes of development of the global market of educational services in the context of modern challenges, in particular digital transformation and its consequences for the higher education market.

The article analyses the digitalisation of the global education market and identifies key trends in digital transformation. Graphical visualisation methods were used to characterise trends in the penetration of the latest ICT technologies in education, in learning technologies and in the emergence of new providers.

The methods of system analysis and generalisation allowed to identify the main directions of transformation of global and regional education markets, to characterise the dynamics of diffusion of the latest forms of education and growth of their profitability, to confirm the turbulence and instability of internationalisation trends and the intensification of competition between traditional and new providers of educational services.

3. The main material of the research

In today's global context, knowledge is becoming one of the most valuable assets, driving the growth of the global education market, its greater diversification and digitalisation. In general, the development of the education market is characterised by the following key trends: increased demand for online education; increased demand for technical and information education, digital skills; intensified competition at all levels between universities and countries for students and financial resources; increased international mobility; growing popularity of short-term courses and certificates; increased demands for quality of education; longer lifelong learning; platforming and networking of the learning process; changing role of universities as agents of local development and social transformation, etc.

Higher education institutions, such as universities and colleges around the world, play a critical role in educating future professionals, conducting meaningful research, and engaging with communities and stakeholders to address challenges at local, national, regional and global levels. Universities are at the forefront of developing the solutions needed to achieve the Sustainable Development Goals. They are shaping the fundamental importance of education in creating healthy and inclusive societies, as defined in the 2030 Agenda.

Digital transformation is the process of using digital tools, such as data and technology, to create value and drive change. The process is not focused on specific technologies, but rather on their integration into core strategies or operational goals. Rapid scaling and widespread adoption of solutions defines a culture of continuous improvement and lays the foundation for further transformation (Digital Transformation..., 2023).

As a result of the COVID-19 pandemic, most educational institutions have been forced to switch to distance learning, leading to a significant increase in demand for online education. This trend is likely to continue in the future as more people have experienced the benefits of being able to study at a time and place that suits them. In 2021, the number of applications to digital platforms increased by 98%.

According to experts, by 2021 Ukrainians will have tripled the number of online courses and will be among the top three European countries for online education. In Ukraine, the highest demand is observed in the capital, with Kharkiv, Odesa, Lviv and Dnipro also among the leaders. The most popular courses are English language, modern business fields, IT programming and training courses for students (Bondar, 2022).

These trends are in line with the global trend of rapid growth in the online services market. Figure 1 shows the growth in online education revenue since 2017. In 2023, online education revenue is expected to almost triple from its 2017 level, reaching 166.60 billion USD. The compound annual growth rate (CAGR 2023-2028) will be 9.12%, resulting in a projected market size of 257.70 billion USD by 2028. The largest market segment is online higher education, with a projected market size of 103.80 billion USD in 2023. Globally, the United States is the undisputed leader, generating the largest revenue of 74,800.00 million USD in 2023. In addition, the average revenue per user (ARPU) in online education will be 0.21 thousand USD in 2023. These trends indicate the high growth potential of this global market.

The global online education market is expected to reach 325 billion USD by 2025, growing at a CAGR of around 7%. In addition, there is a growing trend towards personalised and adaptive learning, with online education platforms incorporating artificial intelligence and machine learning technologies to provide a personalised learning experience. The number of students enrolled in online courses has increased significantly in recent years and this segment of online education will continue to grow, driven by the increasing demand for distance and flexible learning options and the capabilities of the

latest technologies that enable personalised learning. At the same time, the industry may face challenges such as ensuring the quality and accreditation of online courses, as well as addressing the digital divide and unequal access to technology and internet connectivity. However, the overall outlook for online education remains positive, with strong growth potential in the coming years.

The phenomenon of Massive Open Online Courses (MOOCs) shows high growth rates, both in terms of courses and student enrolment. From the beginning of their appearance in 2011 to 2021, the number of students covered by MOOCs increased from 300 thousand to 220 million worldwide (Dhawal Shah, 2021). Between 2012 and 2019, the number of students enrolled in blended and distance learning at traditional universities increased by 36 per cent, while the circumstances of the COVID-19 pandemic in 2020 rapidly accelerated this growth by a further 92% (Dhawal Shah, 2021).

A recent analysis of total student enrollment data from the Integrated Postsecondary Education Data System (IPEDS) found that while the overall market for degree programmes declined by about 3% from 2019 to 2020, four of the largest providers of open-access online education – Southern New Hampshire University (SNHU), Liberty University, Western Governors University (WGU) and Grand Canyon University (GCU) – increased their total enrollments by an average of 11%.

The concept of EdTech has emerged, combining a wide range of digital educational products: online courses, educational platforms, applications for self-development (Ziatiuk, 2021). The range of these digital products is constantly expanding, and investment in EdTech is growing rapidly. A large number of venture-backed digital education startups are disrupting the sector. Between 2017 and 2021,

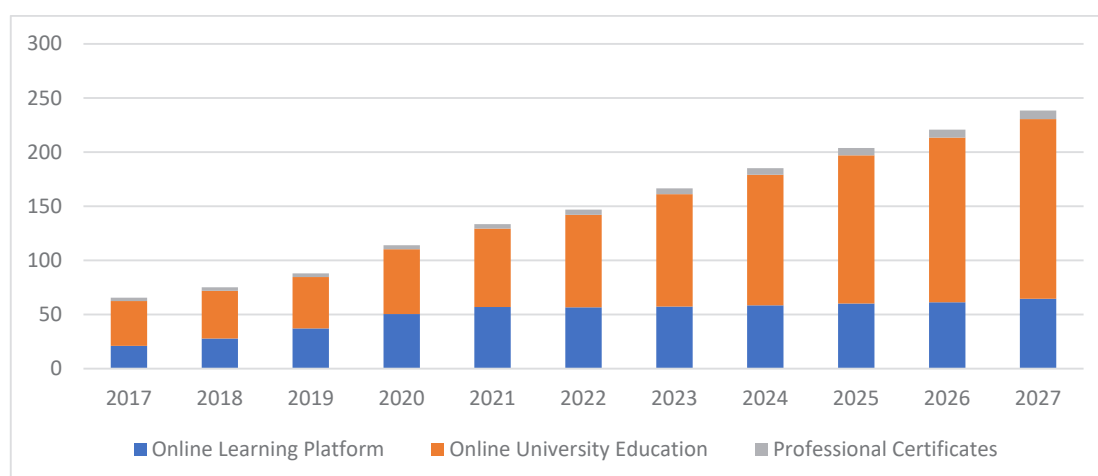


Figure 1. Expected profitability of the online education market, million USD

Source: (Online Education – Worldwide, 2023)

Table 1

Key players in the online education market, revenue, billion USD, 2017–2021

Company	2017	2018	2019	2020	2021
2U, Inc.	0,29	0,41	0,57	0,77	0,95
Coursera, Inc.	-	-	0,18	0,29	0,42
New Oriental Education & Technology Group, Inc.	2,45	3,10	3,61	4,28	-
Tal Education Group	1,72	2,57	3,28	4,51	-
Udemy, Inc.	-	-	0,28	0,34	-

Source: (Online Education – Worldwide, 2023)

venture capital funding for education technology (edtech) will increase from 1 billion USD to 8 billion USD. Investment in edtech is expected to continue to grow as supply increases and educational institutions continue to shift towards blended learning based on advanced digital technologies. Table 1 shows how rapidly the revenues of the main companies operating in the online education market have grown.

The overall dynamics of venture capital in digital education technologies from 2010 to 2021 shows an increase of almost 40 times: from 0.5 to 20.8 billion USD (Figure 2) (Dhawal Shah, 2021). The regional structure of the education venture capital market remains unstable. Despite significant fluctuations, the US share remains significant (40% in 2021) and the European share is growing. A notable trend is the growth in absolute terms (from 0.2 billion USD five years ago to 3.8 billion USD) and relative terms (18% of global investment in 2021) of the share of

a market player such as India. India's growing role is driven by the decline in China's share due to numerous regulatory challenges and the spread of the English language in that country. These are the main regions represented in the venture capital education funding market.

Mergers and acquisitions are becoming increasingly common in this market as a way of overcoming the industry-wide problem of high customer acquisition costs (CAC). In June 2021, 2U announced the acquisition of edX, a non-profit organisation of Harvard and MIT, for 800 million USD. This acquisition gives 2U access to a strong customer brand, approximately 40 million registered users and hundreds of university partners. These assets will give 2U a significant presence in growing markets outside the US and help reduce CAC as it develops its free degree model (Dhawal Shah, 2021). In addition, Indian edtech players such as Emeritus have already reached billion-dollar valuations and have started to acquire companies in the US market.

The growing demand for educational services is reflected in the significant diversification of digital products on offer. These are not only courses and disciplines within the traditional forms of undergraduate, graduate and postgraduate education. There is also a growing range of vocational training, professional development, retraining and personal development courses. One of the most important segments of this market is corporate training courses provided by online learning companies. Of the 15 adult education companies with the highest revenues in 2021, all but one have corporate offerings. Even companies such as Coursera, which initially focused on consumers, have dramatically increased their revenue from corporate customers in recent years (Dhawal Shah, 2021).

The global online education market is dominated by several major players, including Coursera, Unacademy, Eruditus, Udemy and Edex. The accompanying chart illustrates the distribution of market share among these companies. It is important to note that this chart only represents the shares of the main companies and not the entire market, so their sum does not add up to 100.

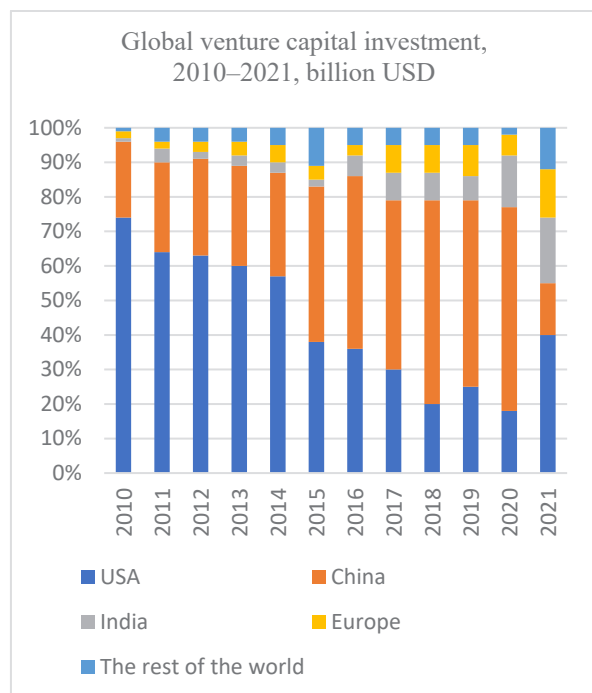


Figure 2. Dynamics and regional structure of global venture capital financing of education

Source: (Dhawal Shah, 2021)

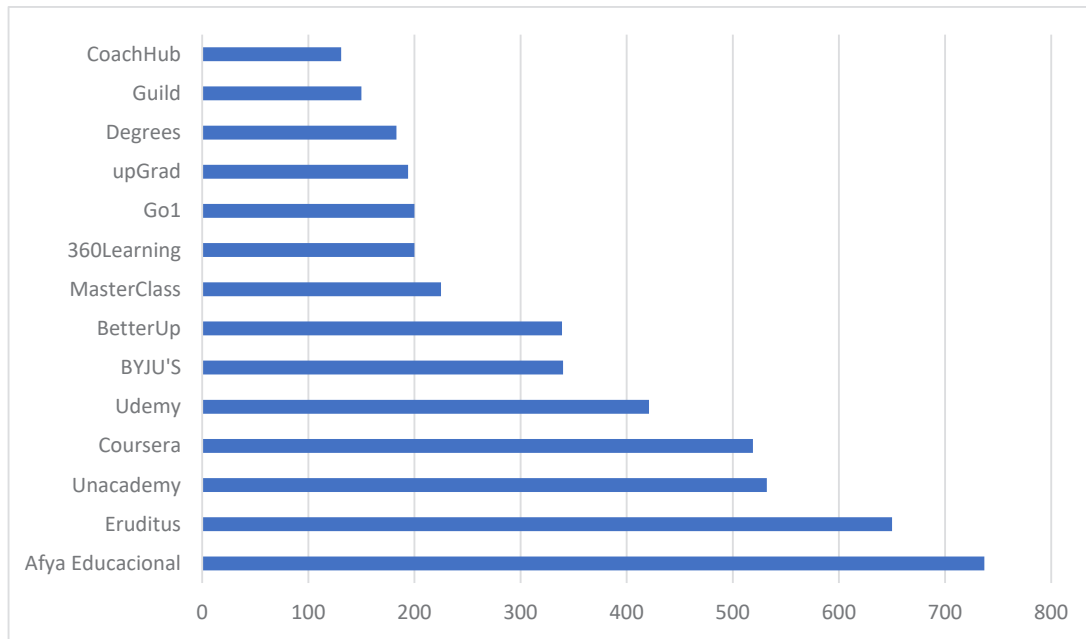


Figure 3. Largest global edtech deals in 2021, million USD (adult sector)

Source: (Dhawal Shah, 2021)

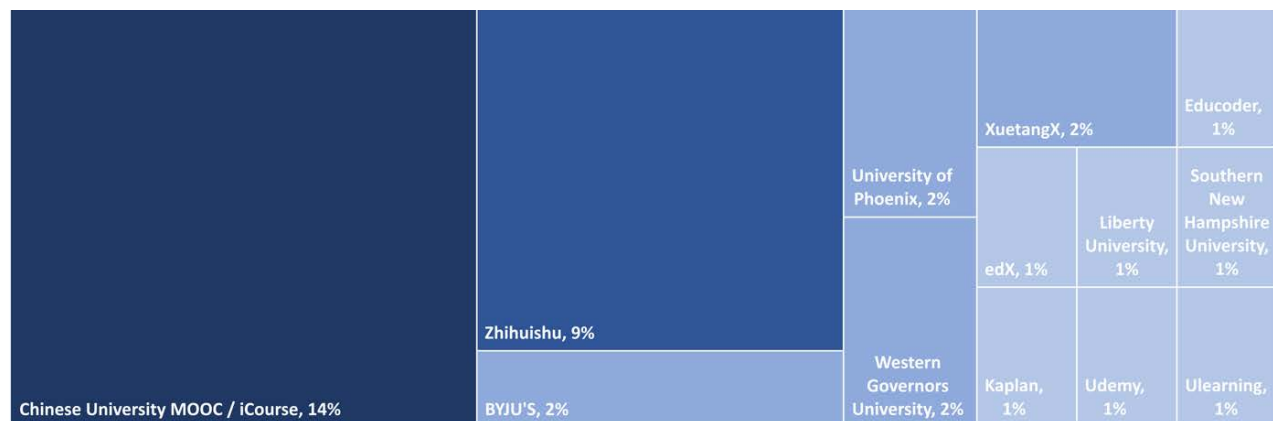


Figure 4. Market share of educational services, %

Source: (Online Education – Worldwide, 2023)

The increasing demand for online education has led to a corresponding increase in the supply of these services. As a result, it is necessary to raise the quality standards of online education. It is common for new offerings to blur the lines between degree and non-degree education. For example, Google's Grow with Google programme, in partnership with Coursera, offers courses in high-demand areas such as user experience design and data analytics. Programmes like these are in high demand and have seen significant growth in enrolment. They provide learners with cost-effective and efficient alternatives to degree programmes. Traditional digital education providers that have focused primarily on degree programmes are now being forced to broaden their offerings in order to compete and thrive in the online education space.

Increased demand and rising quality standards suggest that students are increasingly aware of the return on their investment in education. For some prospective students, particularly those entering high-paying fields such as IT, the opportunity to gain high-demand skills is more important than the institution's programme or brand.

Technology is advancing rapidly, leading to changes in the economy and markets. Skilled workers need training to keep up with new developments, discoveries and trends. This presents a significant opportunity for the education and training sector, as the need for continuous improvement of both employees and the organisation as a whole becomes increasingly urgent. In recent years, there has been a significant increase in the use of technology-based

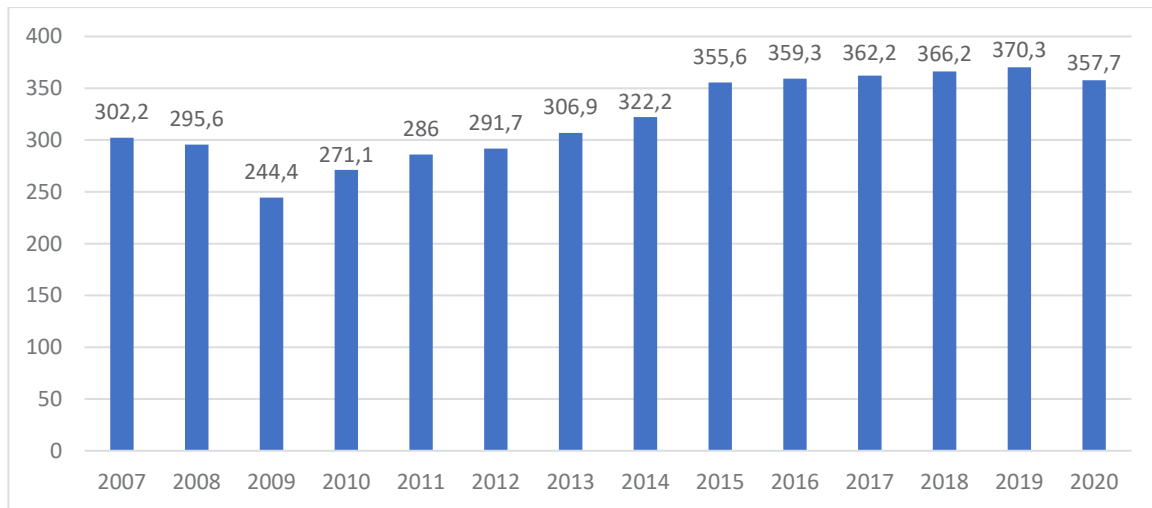


Figure 5. Market size of the global workplace learning industry from 2007 to 2020 (billion USD)

Source: (Market size of the global workplace training industry from 2007 to 2022, with a forecast for 2023)

learning for learning and development purposes. The digital transformation of education is leading to an increased demand for technical education. More jobs now require technical and information literacy and digital skills, leading to increased demand for training in these areas. The nature of work and the technologies that support it are changing. Even teachers now need programming skills as a result of ongoing and widespread digitisation. The global workplace learning sector is also expanding, albeit at a slower pace than the online education market (see Figure 5).

The expansion of online services by educational institutions and the increase in the number of online courses has provided students with a wider range of learning opportunities. However, this has also led to increased competition between educational institutions as they seek to attract students by offering more innovative and effective teaching methods.

The possibility of a decline in the quality of education is a concern. Short courses and certificates are becoming increasingly popular with individuals wishing to improve their skills or acquire new knowledge. This trend may lead to a reduction in demand for comprehensive degree programmes and an increase in alternative forms of education. Short-term courses are more mobile, flexible and responsive to labour market, employer and consumer needs. In the context of global turbulence, they lead to a demand for workers with specific skills.

The modern world demands new learning technologies, but there are also concerns about the quality of knowledge. Extensive digitisation can lead to a loss of concentration, resulting in superficial and concentrated knowledge. However, there is a distinct group of consumers who recognise the value of quality education for the modern labour market. They are demanding quality education services that meet high standards.

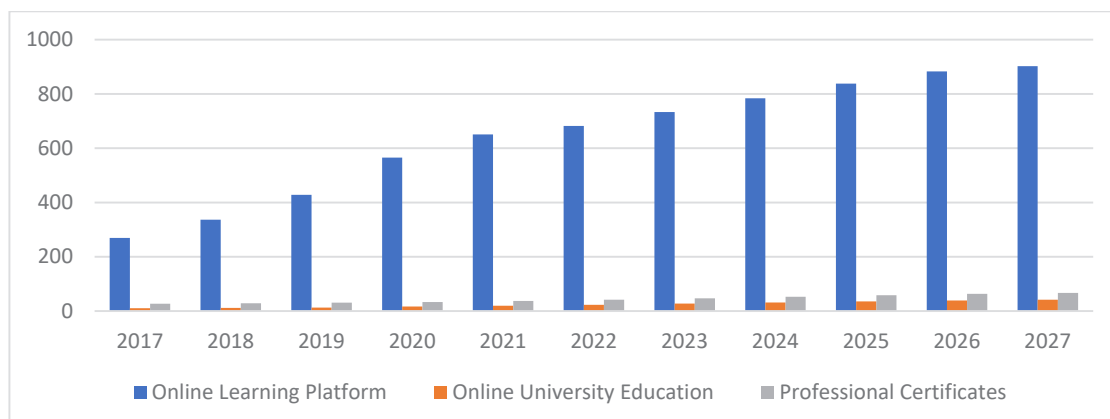


Figure 6. Number of users, million people

Source: (Online Education – Worldwide, 2023)

The rapid digitalisation of the global education market does not negate another defining trend in its development: increased internationalisation and mobility. This trend has been a determining factor since the beginning of the new century, facilitated by the liberalisation of migration policies, unfavourable demographic situations in Western countries, the intensification of export activities and even the expansionist policies of universities at the international level. By 2020, the number of international students had increased significantly. The main countries and centres of student attraction compete fiercely for students and market share. Since then, the situation has changed somewhat due to new factors. The global closure caused by COVID-19 slowed down the pace of internationalisation, but did not stop it. The education sector has been able to adapt to new demands thanks to the latest technologies. The concept of "internationalisation at home" has emerged, which refers to the practice of studying abroad without leaving the country.

Global figures for 2021 show that the number of international students continues to grow (see Table 2).

Moreover, the growth rate of the total number of students in the world is now higher, while in previous years the number of international students grew much faster (Table 3).

However, the dynamics of student enrolment varies significantly from country to country. For example, in Australia, the share of international students decreased by 6 percentage points, and in New Zealand – by 9%. In contrast, in some countries it either increased or remained unchanged (Table 4).

Among all international students in the OECD and partner countries at all levels of higher education, those from Asia account for the largest share (57%). In countries such as Australia, Indonesia, Japan and Korea, they account for more than 80% of all international students (Education at a Glance, 2023). Since 2022, the military aggression in Ukraine has become a new factor that has intensified internationalisation processes. Since the start of the conflict, approximately 7 million Ukrainians have emigrated, with an estimated 4 million currently living outside the country. Exact data on the number of Ukrainians studying abroad are not currently available. However, it is clear that they have contributed to the increase in the number of foreign students worldwide.

Table 2

Dynamics of the number of international students worldwide, million people

	2000	2005	2010	2011	2016
World	2,1	3,0	4,1	4,3	5,0
	2017	2018	2019	2020	2021
	5,410	5,715	6,099	6,376	6,388

Source: (OECD. Education at glance 2013; Education at glance 2016; Education at glance 2023)

Table 3

Number of international students and total number of students in the world, million people

	2017 ^a	2018 ^a	2019 ^a	2020 ^a	2021 ^a	2022 ^b
International students	5,410	5,715	6,099	6,376	6,388	-
Enrolment in higher education institutions, all programmes (number)	223,106	225,511	231,560	238,615	247,542	254,324
%	2,4	2,5	2,6	2,7	2,6	-

Source: (OECD. Education at glance 2013; Education at glance 2016; Education at glance 2023)

Table 4

Inbound internationally mobile students by continent of origin

	2017 ^a	2018 ^a	2019 ^a	2020 ^a	2021 ^a	2022 ^b
USA	984 898	987 314	–	957 475	833 204	948 519
UK	435 734	452 079	489 019	550 877	600 589	633 910
Canada	209 979	224 548	279 168	323 157	312 630	552 580
France	258 380	229 623	246 378	252 444	252 856	364 756
Australia	381 202	444 514	509 160	458 279	378 439	363 859
Russian Federation	250 658	262 416	282 922	–	–	351 127
Germany	258 873	311 738	333 233	368 717	376 359	324 729
China	157 108	178 271	201 177	225 100	221 653	221 653
Japan	164 338	182 748	202 907	222 661	–	201 877
Italy	97 563	106 611	54 855	58 508	72 284	125 470

Source: (Inbound internationally mobile students by continent of origin, 2023; Top host destination of international students worldwide in 2022, by number of students, 2022)

The global education market is undergoing significant changes due to digitalisation and platformisation, as well as the impact of new external challenges. These new circumstances are leading to qualitative changes in the role and functions of modern universities. Increased competition from numerous new educational entities, such as online and non-formal education, requires universities to enhance their entrepreneurial functions, actively undergo digital transformation and develop internationalisation strategies. Furthermore, the global integration of the Sustainable Development Goals requires universities to engage in social transformation and expand their role as drivers of local development. This is a challenge for every higher education institution.

Universities continue to play a crucial role in the digital age. As technology becomes an increasingly important part of social life, universities must transform their functions:

- Educating and preparing students to work in the digital economy. Competences in technology and information systems are becoming increasingly important for success in this field.
- Development and implementation of new technologies. Universities are engaged in research and development of new technologies that are used in various spheres of life. They help to introduce new technologies in various fields, including education, medicine, science and business.
- Open learning and online courses. Universities are expanding open learning and online course opportunities for everyone. This increases the accessibility of learning and learning resources, and allows students to study from anywhere and at any time.
- Development of digital libraries and research centres. Universities are creating digital libraries and research centres that allow students and researchers to collect and analyse information from anywhere in the world.
- Partnerships with businesses and other institutions. Universities establish partnerships with companies, institutions and government agencies.

To remain competitive in the marketplace, educational institutions and companies need to adapt their strategies to new challenges and circumstances. This may involve investing in new technologies, developing innovative products and services, or entering new markets to diversify revenue streams.

Digital transformation processes are constantly changing the educational landscape. While the latest technologies undoubtedly offer opportunities for development and expansion, it is important to

understand the potential threats and challenges posed by the widespread use of ICT in education and other activities. Ensuring the quality of education is a key issue. The increase in the number of educational service providers, without adequate content control, can lead to the spread of unwanted and anti-social information. In addition, increased competition may lead to the use of unfair technologies by educational institutions, resulting in a decline in the quality of content. The increase in global competition among educational institutions for students, market share and financial flows can have both positive and negative effects on national education markets. As a result, universities and governments need to develop new strategies that take account of these new realities and employ new active mechanisms. For the academic community, it is crucial to monitor current trends, analyse new phenomena and processes and identify them objectively.

4. Conclusions

The education sector is undergoing a global transformation in the age of digital development. Content is becoming more personalised and its presentation on different devices is diversifying. In addition, the demand for digital services is growing. The experiments of the 2020s have shown that the implementation of digital solutions can help institutions meet new challenges. Trends in the global economy are driving universities to meet the growing digital expectations of their customers and consumers.

The global market for education services is affected by a number of factors and threats. Economic instability reduces the population's ability to access quality education, necessitating the development of funding mechanisms from external sources or government support. The demographic situation, such as declining birth rates or increased migration, can pose certain threats to the education services market and are factors in its turbulence, leading to reduced demand for education services and lower student enrolments. These include technological changes that are disrupting the traditional education model and making education more accessible via the internet. This puts pressure on traditional educational institutions and threatens their market share. In addition, competition is increasing due to the growing number of educational service providers offering a wider range of products and services. This has led to more complicated conditions for traditional providers and an increase in the elasticity of demand for educational services.

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Received on: 09th of October, 2023

Accepted on: 27th of November, 2023

Published on: 28th of December, 2023