Competitiveness and Trends in Ukrainian Higher Education: Modern Threats and Challenges

Nataliia Kuzminets [1*], Iryna Zhorova [2], Liliia Shkoliar [3], Viktoriia Samarina [4], Oksana Melnychuk [5]

[1] Department of History of Ukraine, Faculty of History and International Relations, Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University, Vinnytsia, Ukraine.
[2] Department of Pedagogics and Management of Education, Communal Higher Educational Establishment "Kherson Academy of Continuing Education" of Kherson Regional Council, Kherson, Ukraine.
[3] Department of Philosophy, Faculty of Sociology and Law, Igor Sikorsky Kyiv Polytechnic Institute, Kyiv, Ukraine.
[4] Department of Business Foreign Language and Translation, Educational and Scientific Institute of Social and Humanitarian Technologies, National Technical University "Kharkiv Polytechnic Institute", Kharkiv, Ukraine.
[5] Department of Psychology, Interregional Academy of Personnel Management, Kyiv, Ukraine.
Corresponding author: 1974natalika1@gmail.com

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Abstract: Modern higher education is in a phase of transformation, which is associated with digitalization, globalization, and changes in methodology and approaches to teaching. That is why the effectiveness of adaptation of higher education institutions determines their competitiveness and is important for the target audience. The purpose of the study was to determine the competitiveness of higher education institutions in Ukraine based on the analysis of the effectiveness of university ratings in terms of attracting the target audience. The study used the methods of induction, deduction, systematization, statistical and logical-abstract comparison, correlation analysis, as well as a survey of 562 applicants, 312 parents of potential applicants, and 215 entrepreneurs. The results of the study indicated a low level of orientation of university rankings towards the target audience, especially entrepreneurs. Among the ranking factors that influenced the choice of a university, applicants identified the Webometrics ranking, which is related to the effectiveness of digital technologies. The survey results pointed to the importance of university infrastructure and the availability of information on websites for applicants, employment prospects and teaching methodology for parents of applicants, and teaching methodology and website accessibility for employers who choose universities to improve their employees' skills, find new staff, or cooperate with universities. Based on the results of the study, it was determined the feasibility of creating target audience-oriented rankings of higher education institutions by adding a rating for employment, cooperation with enterprises and infrastructure development, as well as increasing the Webometrics rating coefficient.

Keywords: ranking, applicant, target audience, employers, digitalization, webometrics, World University Ranking.

Introduction

The development of higher education is important at the national and global level, as it provides qualified personnel for all sectors of activity. Countries with a high level of education have better economic, social and cultural indicators. On the other hand, a successful economy makes education accessible to the population, which affects the further development and well-being of the country. However, society has changed significantly in the era of digitalization and globalization of the economy, which is why the requirements for educational institutions have changed [1]. Conservative teaching methods have been replaced by methods aimed at developing practical skills, critical thinking, analytical abilities, and the ability to continuously learn [2, 3]. Thus, education has changed in recent years to become more student-centered and more in line with employers' requirements for training qualified personnel [4]. Against this backdrop, the competitiveness of higher education institutions has increased, as reputation no longer plays a major role, but the ability to adapt the educational program to meet modern requirements is taken into account

[5]. As for university rankings, they are mostly assessed based on a comprehensive analysis of various indicators that do not allow applicants and employers to prioritize aspects when choosing a university for study or cooperation.

Ukraine's higher education system has undergone significant changes on its way to achieving European standards. A number of legal and regulatory documents have been adopted that set new requirements for the quality of training, certification of academic staff and transformation of methodological approaches. An important vector for the development of higher education in Ukraine is the Strategy for the Development of Higher Education for 2021–2031, which pays great attention to the development of the autonomy of higher education institutions, cooperation of higher education institutions with European universities and businesses, and compliance of higher education institutions with European higher education standards [6]. However, despite the great attention paid to the transformation of national universities, only a small share of them is mentioned in international rankings. This fact indicates problems with the competitiveness of higher education institutions at the global level. Another aspect that needs to be studied is the internal competitiveness of higher education institutions in terms of targeting the target audience – applicants and employers.

Literature review

The modern higher education system is in a phase of digital transformation, which is becoming a new challenge for higher education institutions [7]. Deutsch et al. [8] argue that universities are facing digitalization challenges and define the success of digitization processes as related to e-administration and effective digitalization at the government level. In contrast, Miranda et al. [9] emphasize that the difficulties of digitalization are not an obstacle to the effective implementation of technology in the educational process. Moreover, the authors believe that the educational environment itself has benefited from technological progress. The authors describe this transformation of education as education 4.0, which includes innovations in competence acquisition, teaching methods, information and communication systems, and infrastructure. Thus, through the widespread introduction of information technology in education, it is possible to encourage students to develop technically, technologically, as well as to think analytically and critically evaluate a large amount of information.

Historically, both learning technologies and approaches and guidelines have changed. In the 18th century, Education 1.0 introduced technologies such as the ballpoint pen and the typewriter, and the teacher was central to education. Education 2.0 coincided with the second industrial revolution of the 20th century. Calculators, printers, and the first computers began to appear among the technologies, and the role of the teacher was still central, but it changed from that of a sage to a reference source of information. Education 3.0 coincided with the third industrial revolution of the late 20th century and was associated with large-scale computerization and process automation. Students gained greater access to information, and the role of the teacher was reduced to curation and collaboration. Education 4.0 is associated with the introduction of information technology, distance learning, and virtual reality, and the pedagogical approach has become completely student-centered [9, 10, 11].

It should be noted that the transition from Education 3.0 to Education 4.0 was very rapid and took less than 20 years. Thus, the adaptation of higher education institutions was rapid, and its success depended on the resources of the institutions, the desire to innovate among university staff, and the perception of change by students. A significant impetus for the development of university digitalization was the COVID-19 pandemic, which opened up the benefits and opportunities of the digital educational space [12]. Thanks to the technical support of universities and the willingness of teachers, it was possible to organize online learning, often even within a week during the lockdown [13]. The interest and support of the student community in the online learning format were also positive aspects [14].

However, digitalization in education, in addition to the benefits of online learning, expanding communication horizons, virtual reality for laboratory work, and increased access to information, has brought new challenges, including the reformatting of curricula to include information technology courses, teaching critical thinking, analysis, and selecting the right information from the proposed ones [15]. The approach to learning has also changed, becoming student-centered to ensure that students acquire competencies that satisfy employers [16]. Another aspect is the problem of student assessment, which can have false results due to the use of artificial intelligence or dishonesty in remote testing [17].

Higher education in Ukraine has also been influenced by digitalization and innovation, which have been implemented in educational institutions to varying degrees, due to both opportunities and the desire for change [18]. However, the COVID-19 pandemic has become an impetus for the introduction of distance learning, which has not lost its relevance under martial law [19]. Although the Ukrainian higher education system is in difficult conditions due to martial law, despite the lack of funding and security challenges, higher education institutions do not deviate from the vector of the

Higher Education Development Strategy 2021–2031 and demonstrate positive steps towards achievements. Universities are introducing new standards to increase the credibility of Ukrainian graduates' diplomas, attract investment, and cooperate with international partners [6].

In such conditions of transformation of educational methods and approaches, the role of competition between higher education institutions has increased. Institutions compete for research grants, funding, target audience interest, quality publications, ranking positions, etc. [20]. Today, there are standards for creating expert rankings of higher education institutions that encourage universities to improve and objectively assess the university's performance according to key criteria [21, 22]. However, it is important to assess how effective these rankings are for the target audience: applicants and entrepreneurs.

The purpose of the study was to determine the competitiveness of Ukrainian higher education institutions based on the analysis of the effectiveness of the university ranking in terms of attracting the target audience.

To achieve this goal, there was set the following objectives: to evaluate the indicators used in the rankings of Ukrainian higher education institutions; to compare the correlation of the ranking results with the indicators characterizing the attraction of applicants and entrepreneurs; to conduct a survey among the target audience to determine the key aspects of choosing a higher education institution.

Materials and methods

The following methods were used in the study: deduction, induction, systematization, statistical and logical-abstract comparison, survey, and generalization of results. Using the methods of induction, deduction, systematization and logical and abstract comparison, it was analyzed the main aspects of the rating. There was statistically compared the factors that characterize the attraction of applicants with other ranking factors by establishing a correlation between them. We conducted an online survey of 562 applicants, 312 parents of potential applicants, and 215 entrepreneurs. The survey results are presented in the form of graphs. Statistical calculations were performed in Excel. We adhered to the principles of confidentiality and ethics while conducting the survey.

Results

To determine the main factors that are taken into account in the calculation of the All-Ukrainian ranking of higher education institutions, we used open information from the Top 200 Ukraine ranking and the Consolidated Ranking of Ukrainian Universities [23]. We have identified the main factors that were taken into account when creating the rankings, described their characteristics and coefficients in the overall ranking. The data is presented in Table 1.

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Table 1. Characteristics of the components of ratings of higher education institutions in Ukraine

Overall rating	Rating name	Characteristics	Coefficient
Top 200 higher education institutions of Ukraine	Ranking among international higher education institutions	Assessment of academic performance in accordance with international standards	1.5
	Scopus ranking	Publications in international scientific and metric databases	1.3
	Ranking by Webometrics	Evaluation of research achievements based on the analysis of the university website	1.0
	The University Impact ranking	Evaluation of the impact on society through research, education, management and training	1.25
	The World University Rankings	Evaluation of academic performance based on IREG Guidelines for Stakeholders of Academic Rankings	1.5
	The World University Rankings sustainability ranking	Evaluation of achievement of sustainable development goals	1.25
	Ranking of winners of scientific competitions	Evaluation of scientific activity	0.55
	Rating of accreditation cases of NAAQA 2019-2023	Organization of educational and methodological work	0.55
	Ranking by the number of patents obtained	Inventive activity	0.55
	Ranking of applicants' applications	Average competitive score of applicants	0.55
Consolidated ranking of Ukrainian universities [23]	Score for the contract form of education	Average grade point average of applicants who entered the contrasting form of education	1
	“Top 200 Ukraine”	Place in the ranking “Top 200 Ukraine”	1
	Scopus	Rank in the rating according to activity in the Scopus scientific and metric database	1

Source: author's development based on Ranking table of higher educational institutions “Top 200 Ukraine” [24]

As can be seen from Table 1, university rankings are based on multifactorial indicators that take into account the scientific, research, academic, and inventive activities of institutions, as well as popularity among applicants. Moreover, the top 200 ranking took into account the average score of applicants upon admission, while the consolidated ranking of Ukraine 2024 took into account the average score of applicants who were accepted for a contract. In our opinion, the consolidated ranking of Ukraine 2024 is more focused on attracting the target audience, as it has a higher coefficient of consideration of the average score of applicants than the Top 200 Ukraine ranking. Another aspect of greater objectivity is the inclusion of the average grade point average among contract students, which offsets the influence of the financial component on the choice of an educational institution. That is, the influence of applicants who prioritize state-funded education as more profitable is not taken into account. The Top 200 ranking is, in turn, a component of the consolidated ranking, which indicates the high expertise of the Top 200 ranking, which is based on international standards for creating rankings. However, in our opinion, such components as the place among international higher education institutions and the achievement of the principles of sustainable development are calculated using an overestimated coefficient. After all, only 11 universities are included in the international ranking, and less than 20 Ukrainian universities are included in the ranking of sustainable development goals. Another negative aspect is the absence of a separate factor that determines cooperation with employers and graduate employment.

In order to assess the effectiveness of the rankings in terms of attracting applicants, this study conducted a statistical comparison to determine the correlation between the average score of applicants and other factors taken into account

in the above rankings. Table 2 shows the results of statistical calculations of the correlation between the average grade point average of contract applicants and the Top 200 and Scopus rankings in the consolidated university rankings and the average grade point average of applicants and other factors in the Top 200 rankings.

Table 2. Correlation between rating indicators

Rating	Average score of applicants
Among international higher education institutions	0.39
Scopus	0.51
Webometrics	0.56
The University Impact	0.34
The World University Rankings	0.38
The World University Rankings sustainability	0.32
Winners of scientific competitions	0.49
Accreditation files of the NACAA 2019-2023	0.38
By the number of patents obtained	0.20
Overall rating	0.69
Rating	Average score of applicants for contractual education
“Top 200 Ukraine”	0.49
Scopus	0.40

Source: created by the author based on [23, 24]

As can be seen from the table, the highest correlation was observed between Webometrics scores and the average score of applicants, which indicates the role of the university website and the introduction of digitalization in higher education institutions in choosing a university to study at. We also noted a medium-strength relationship between applicants' GPA and the Scopus ranking, which suggests that international research activity also influences the choice of future university students. However, among contract applicants, the relationship with the Scopus ranking was moderate. It is worth noting that other indicators had a weak or moderate correlation with the average score of applicants, which indicates that they are not very targeted. Comparing the Top 200 Ukraine ranking and the consolidated ranking of universities in 2024, we found that the average score of contract applicants had a lower correlation with the Top 200 Ukraine ranking than the average score of all applicants. This may be due to the higher number of state-funded places among top universities, which influenced the level of GPA among applicants.

As can be seen from the analysis of Ukrainian university rankings, most indicators that have a high coefficient do not have a strong influence on the choice of applicants. That is why we conducted a survey among potential applicants, their parents and employers to determine the main aspects that they take into account when choosing a university to study. The results of the survey are shown in Figure 1.

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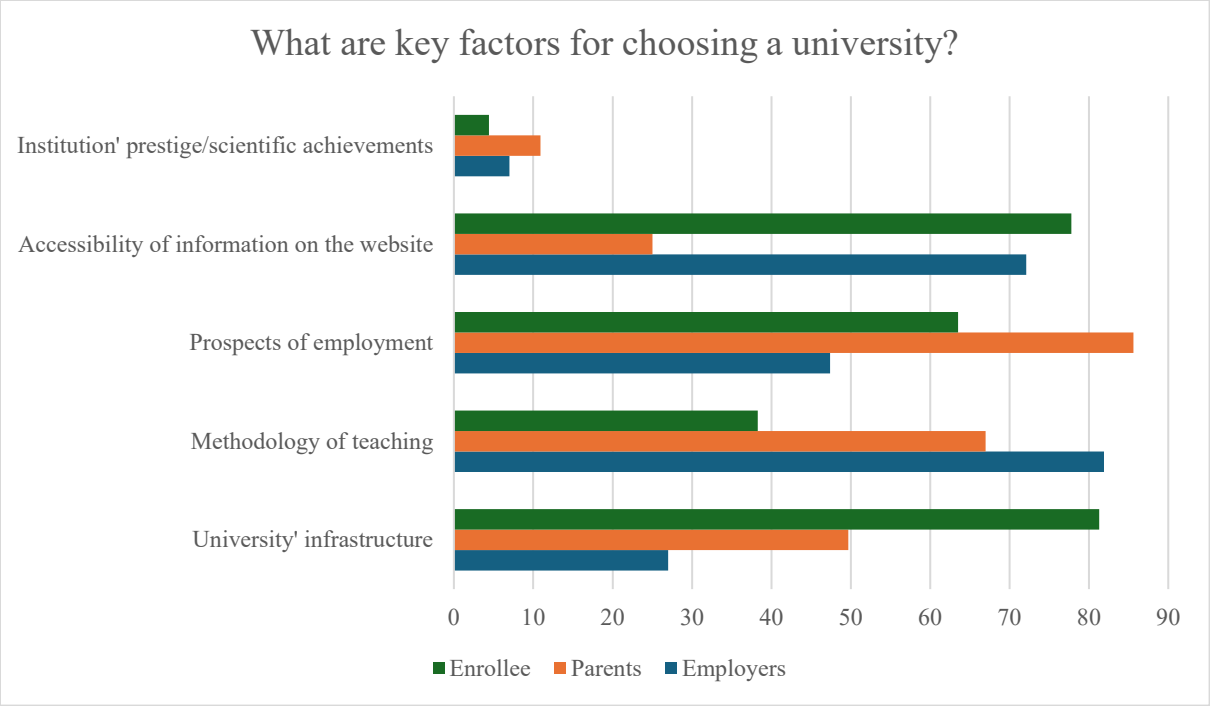

Figure 1. Results of the study
Source: created by the author based on the survey results

As the survey shows, the predominant factors for applicants were the university's infrastructure (81.3%) and the availability of information on websites (77.8%). An important factor was also the prospect of employment (63.5%). For parents, the most important factors were employment prospects (85.6%) and teaching methodology (67.0%). University infrastructure was considered an important aspect by 49.7% of parents. Instead, the availability of information on the website was less important for 25.0% of parents compared to applicants (77.8%), which indicates that young people use digital technologies to a greater extent, which should be taken into account when planning teaching methods. When choosing cooperation with universities and searching for further education institutions, employers take into account the teaching methodology (81.9%) and the availability of information on the website (72.1%). Moreover, the methodology included the convenience of obtaining new knowledge, including remotely. Employers also noted the importance of employment prospects (47.4%) among students in order to find future qualified specialists and cooperate with the university.

A negative aspect was also the low interest of applicants, parents and employers in the scientific achievements of the institution, which indicates that the proposed ratings of educational institutions are not focused on the target audience of applicants, parents of applicants and entrepreneurs. This observation was confirmed by the survey results, which indicated that the above ratings were taken into account by 7.5% of applicants, 10.6% of parents of applicants and 12.6% of entrepreneurs.

In our opinion, it is important to create a university ranking that would be aimed at the target audience by adding such criteria as employment prospects, cooperation with employers, and assessment of university infrastructure. It is also advisable to change the coefficients of the factors taken into account in the ranking, namely to increase the coefficient of the Webometrics ranking, which assesses the achievements of digitalization in the educational institution, and to reduce the weight of the rankings of scientific achievements and the ranking among international universities. Thus, the updated university ranking can help to facilitate the optimal choice of educational institutions among applicants and employers who plan to upgrade their employees' qualifications or are looking for qualified specialists.

Discussion

The ranking of higher education universities is based on international standards, but most factors do not affect the target audience of applicants, their parents, and entrepreneurs. Instead, international rankings have recently focused

on achieving sustainable development goals [25]. Moreover, such a multifactor ranking as The World University Rankings, which was used to create a ranking of Ukrainian universities, is losing its relevance because it does not meet the principles of transparency and relevance [26]. Cardozo and Ricardo da Silveira Barros [27] pointed out the injustice of the quantitative criteria for calculating The World University Rankings and proposed its cluster calculation. Despite the shortcomings of The World University Ranking, only this ranking took into account employment, which was identified as the most important factor among parents of applicants and an important factor for more than 60% of applicants and more than 45% of entrepreneurs in Ukraine. At the same time, current international rankings do not have a positive impact on employment, as evidenced by Chen [28], who found that employers are afraid to hire graduates of prestigious higher education institutions because they believe they will not be able to provide them with working conditions and salaries.

It was found that the most important factor among applicants is the availability of information on university websites. There was also a correlation of the highest strength between the average score of applicants and the Webometrics ranking, which indicates the importance of digitalization for applicants. Another aspect of the impact of digitalization is the growing influence of social media and electronic feedback from students compared to feedback from friends, employment prospects, convenience of university location, and other aspects [29]. Kholiavko et al. [30] emphasize the key role of digitalization for the competitiveness of higher education institutions, through changes in teaching methodology and a shift in emphasis in training to information technology.

Analyzing the characteristics of the rankings of Ukrainian universities, we found a lack of focus on employers. This indicates a low level of cooperation between higher education institutions and industry. This, in turn, reduces the employment rate of graduates. At the same time, when choosing a university for cooperation and staff development, entrepreneurs take into account the teaching methodology, including information technology capabilities, and the availability of information on the website. Thus, the study revealed the importance of teaching methodology in terms of digitalization and competency-based approach. The competency-based approach and effective methodology have a positive impact on professional activity, which was confirmed by the results of the study by Al-Mamary and Alshallaqi [31], who found a positive impact on the further entrepreneurial activity of students to whom the principles of teaching autonomy, proactivity, innovation were applied compared to conditions of aggressive competition between students.

The study also revealed a negative aspect of the low level of interest in the scientific achievements of universities, especially among entrepreneurs. This trend indicates low cooperation between entrepreneurs and research institutions, which has a negative impact on the introduction of innovations and inventions [32]. Government-industry-university cooperation plays an important role in the implementation of innovations [33]. The state is interested in improving the relationship between research institutions and enterprises, as this cooperation increases the capacity of the economy. At the same time, there are barriers to this cooperation based on distrust, loss of ownership of the development, and a lack of desire to change and invest in new technologies [34].

Given the importance of cooperation with enterprises and the role of digitalization for applicants and employers, it is advisable to include a rating of employment, cooperation with enterprises, infrastructure development, and to increase the coefficient of the Webometrics digitalization rating in the university ranking. Despite the low level of sustainability rating among Ukrainian universities, it is advisable to take this factor into account in order to create “green universities.” Moreover, compliance with the sustainable development goals will increase the ranking of universities among foreign universities, which will help attract foreign grants and investments [35].

Conclusions

The results of the study revealed a low orientation of the ratings of Ukrainian higher education institutions to the target audience – applicants, which was manifested by the low coefficient of the average score of applicants compared to the coefficients of other factors. Based on the correlation assessment, we found that the choice of applicants is most influenced by the Webometrics rating, which is based on the analysis of the university's website and is related to the success of digitalization. Instead, we found a low level of influence of international university rankings, sustainable development, and scientific achievements on the choice of applicants. After conducting a survey among the target audience, we found that the most important factors for applicants to choose a higher education institution are the university's infrastructure and the availability of information on the university's website, and for parents of applicants - employment prospects and teaching methodology. The analysis of university rankings also revealed the absence of such a factor as cooperation with enterprises, which may be related to employment prospects. This indicates a low level of cooperation between universities and industry, which negatively affects the introduction of innovations in economic activity. Higher education institutions do not take into account the importance of employers as their target

audience, although the latter choose universities both to improve their skills and to find new staff. Given the importance of targeting the target audience, it is advisable to include in the rankings the ranking of employment, cooperation with enterprises, infrastructure development, and to increase the coefficient of the Webometrics digitalization ranking.

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