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Integration Processes Between Higher Education and Production: Current Status and Development Prospects

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Abstract

This article investigates the models and specific features of integrating links between higher educational establishments and economic entities. In addition, the methodology for evaluating the activities of higher educational establishments by reputable international ratings, the results of these ratings and the factors influencing them have been studied in the article. The article also reflects suggestions and recommendations on resolving the problems encountered in the integration process in higher education on the basis of the results of the research.

Keywords: *Higher Educational Establishments; Integration; International Ratings; Strategic Purpose; Interdisciplinary Research and High-Tech Development*

Introduction

From our prospective, the issues of integration of higher education and economic entities should be considered in terms of the characteristics of the integration process in the field of higher education and the strategic directions of economic entities.

With this in mind, in this paragraph of the research we will make an effort to identify general and specific aspects, long-term trends and tendencies through a separate analysis of the integration processes taking place in the two areas and the problems experienced in them.

We feel that as a result of such an approach, it will be possible to identify the areas of cooperation between the strategic purposes of higher education and the activities of economic entities and the organizational and economic mechanisms for their implementation.

In turn, the identification of the areas of cooperation will ensure the continuity between the strategic purposes of development.

Analysis of Scientific Literature

According to the analysis of scientific research conducted in recent years, integration processes in the higher educational system are taking place in a number of areas.

Particularly, the scientific research conducted by K. Chen, Y. Zhang, G. Zhu, R. Mu [1] focuses on assessing the impact of networking on the effectiveness of research with the research centers of universities and industrial enterprises. As they note that multifaceted cooperation is a priority model that ensures the long-term effectiveness of integration processes with a positive impact on all areas of university activities (education, research, commercialization of scientific results).

Issues on maintaining cooperation between universities, companies, public organizations and regional public administration are discusses in scientific research carried out by R. Lukman, D. Krajnc, P. Glavic [2], G. Trencher, M. Yarime and A. Kharrazi [3].

It has been acknowledged that the deepening of integration relations between these entities plays a strategic role in the socio-economic development of regions, isolated cities and settlements.

Investigations on developing [5] methods for assessing the effectiveness of cooperative relations between scientific and research centers at different universities, as well as problems and strong aspects [4] of cooperative relations between scientific and research centers within a university can be included as notable areas of the research.

At the same time, research dedicated on maintaining scientific cooperation between countries with radically different educational systems is of particular interest.

In particular, the implementation of a joint doctoral program with the Chinese Academy of Agricultural Sciences and Wageningen University in the Netherlands [6] and activities directed to determine the effectiveness of universities and scientific research centers by evaluating the final results of integration processes [7] are another example of the research.

Besides, eliminating conflicts of interest between universities and sectors of the economy in launching large-scale projects, problems related to financing scientific research by business entities and organizing student internship programs in industrial enterprises, improving the system of motivating scientists to develop cooperation between universities and business entities, problems on cooperation between schools and higher education, substantial new forms of cooperation that emerge as a result of changes in the ecosystem of scientific research and other aspects are noted as issues that scientists are focusing on [8, 9, 10, 11, 12].

Another important area of research in the integration processes in the higher educational system is issues related to the integration of interstate education. It is recommended that the problems of educational integration be investigated in three groups in a number of scientific literature [13, 14, 15]. Particularly:

– macro-level integration of higher education. Educational integration at the macro level is interpreted as the dynamics of changes in the international higher education system, cooperation between international and national organizations, as well as the global higher education system that have emerged in the process of globalization;

– meso-level integration of higher education. At this level, the structural aspects of globalization in the national education system are analyzed and its subjects are identified;

– micro-level integration of higher education. Research in this direction is based on an empirical analysis of the experience gained by participants in the integration process (students, teaching staff, researchers).

Methodology of the Research

In view of the tasks assigned in Presidential Decree of the Republic of Uzbekistan of October 8, 2019 No. UP-5847 "About approval of the Concept of development of system of the higher education of the Republic of Uzbekistan till 2030" and views suggested by academic economists in this area scientific observation, comparison, grouping, expert evaluation, analysis and other methods were used in this scientific article.

Analysis and Results

Although the research, conclusions, proposals and recommendations on the integration process in higher education are noteworthy, in our judgment, they are not enough to provide relevant feedback on the problems and development trends in this area.

We feel that it is expedient to study the dynamics and directions, forms and conditions of integration processes in the higher educational system, as well as the impact of other factors in terms of strategic purposes of higher education institutions. Since strategic purposes may or may not realize integration processes. It depends upon the meaning and content of the tasks assigned. Based on this, we will try to analyze the strategic purposes developed by the higher educational system.

At present the strategic purposes of higher educational establishments are represented by key indicators of international rankings on education.

Table 1
Rating criteria used by reputable international rating companies (as of January 1, 2022)

QS Rankings QS Quacquarelli Symonds [16]		**Times Higher Education (THE)** Independent rating [17]		**Academic Ranking of World Universities (ARWU)** Shanghai University Rankings [18]	
Rating criteria	**Points**	**Rating criteria**	**Points**	**Rating criteria**	**Points**
Academic Reputation	40 %	Teaching (the learning environment)	30 %	Number of Nobel Prize or Fields Medal winners among teachers or alumni	Absolute unit
Employer Reputation	10 %	Research (volume,income and reputation)	30 %	Presence of teachers or students among mothe st cited authors	Absolute unit
Faculty/Student Ratio	20 %	Citations (research influence)	30 %	Availability of scientific publications in natural and technical sciences	Absolute unit

Citations per faculty based on data from Elsevier Scopus (Abstract and citation database)	20 %	International outlook (staff, students and research)	7,5 %	Science Citation Index-Expanded (SCIE) and Social Science Citation Index (SSCI) indexed scientific works	Absolute unit
International Faculty Ratio	10 %	Industry income (knowledge transfer)	2,5 %	Ratio of the above indicators to the number of teaching staff of the higher educational institutions	Relative unit

As is seen in Table 1, the main emphasis is placed on publishing research papers and recognizing scientific results in the form of citations in the academic environment in determining the ranking of higher education institutions.

Indicators of higher education institutions such as employer and academic reputation environment, international students' involvement, the ratio between the teaching staff and the student body are among the factors that increase the rating.

In particular, according to the QS World University Rankings, the top four places in the 2022 World University Rankings are Massachusetts Institute of Technology (1st place in 2020, 1st place in 2021, 1st place in 2022), University of Oxford (4th place in 2020, 2021 5th place in, 2nd place in 2022), Stanford University (2nd place in 2020, 2nd place in 2021, 3rd place in 2022) and University of Cambridge (7th place in 2020, 7th place in 2021, 2022 4th place in).

The first top 20 places in the QS World University Rankings include 4 higher educational institutions in the Asian region: the National University of Singapore (11th place), Nanyang Technological University (12th place), Tsinghua University (17th place) and Peking University (18th place).

In turn, according to the Times Higher Education, in the World University Rankings 2022, 1st place is given to University of Oxford (1st place in 2020, 1st place in 2021), 2nd place is the California Institute of Technology (2nd place in 2020, 2021), 3rd place was awarded to Harvard University (7th place in 2020, 3rd place in 2021) and 4th place to Stanford University (4th place in 2020, 2nd place in 2021). Only two of the top 20 higher educational institutions in the Asian region, Peking University (24th in 2020, 23rd in 2021, 16th in 2022) and Tsinghua University (23rd in 2020, 20th in 2021) are in top 20.

In the Academic Ranking of World Universities 2021 Harvard University comes out top (1st place in 2020), Stanford University is the 2nd in the ranking (2nd place in 2020), Cambridge University is in the 3rd place (3rd place in 2020) and Massachusetts Institute of Technology is ranking 4th (4th place in 2020) place). No higher educational institution in the Asian region was included in the top 20 of this Academic Ranking.

It should be noted here that more than 30 international and more than 60 national ratings have been published for higher education institutions in 2021. Particularly, the "50 Richest universities in the world: university endowment rankings" published by Nonprofit Colleges Online compares the budgets of higher educational institutions. According to the results of 2021, Harvard University tops the ranking with a budget of 41.9 billion dollars, the second place to Yale University (31.1 billion dollars), 3rd place went

to Stanford University ($ 29 billion), 4th place to Princeton University ($ 26 billion), and 5th place to King Abdullah University of Science and Technology in Saudi Arabia (20 billion dollars) [19].

As well, "World Reputation Rankings" published by the Round University Ranking is ranking academic reputation of higher educational institutions [20], the ranking of the largest higher educational institutions are regularly announced (with 4 million students at Indira Gandhi National Open University in India in 2021, 2 million students at The National University in Bangladesh, 1.9 million students at Anadolu University in Turkey and 1.5 million students at Islamic Azad University in Iran [21]).

The following conclusions can be drawn on the basis of the data provided in international rankings and rankings:

– **firstly**, higher educational institutions will need to prioritize high-scoring directions in order to gain access to and strengthen prestigious international rankings. We consider it to be one of the strategic purposes. Specifically, one of the strategic purposes of Presidential Decree of the Republic of Uzbekistan of October 8, 2019 No. UP-5847 "About approval of the Concept of development of system of the higher education of the Republic of Uzbekistan till 2030": "... at least 10 higher educational institutions should be included in the Quacquarelli Symonds World University Rankings, Times Higher Education or Academic Ranking of World Universities in the list of top 1,000 higher educational institutions, including the National University of Uzbekistan and Samarkand State University in the list of top 500 higher educational institutions " [22].

We think that the interpretation of a strategic purpose can pose a number of problems, including:

– excessive "formalities" or red tape. In order for higher educational institutions in Uzbekistan to be included in the ranking, scientific papers should be published only in strictly defined publications, in most cases in English, in accordance with international requirements for publication (the most important criteria for research and citations are given for publications in English). This requires excessive labor and financial costs;

– prioritizing the improvement of indicators of rankings will inevitably cause an increase in the number of publications in higher educational institutions in developing countries that do not have any positive impact on the quality of the educational process and research. As a result of it, those who work in higher educational establishments will lose confidence in providing conclusions, suggestions and recommendations dampens or their views might almost be ignored in practice;

– the organizational structure of higher educational institutions (the number of institutes they operate, faculties and other departments, as well as the number of teaching staff and researchers) is not taken into account in considering indicators of the rankings. Here, even there is no concordance in terms of the number of publications per employee;

– many higher educational institutions lose their national identities and academic legacies and gained experience over the years as a result of "imitating" (in relation to syllabus, teaching technologies and others) the world's top-ranked universities and institutes when designing their activities.

At the same time, setting goals in such a way in the higher educational system, in our judgment, causes a mismatch between the strategic purposes of higher education and economic entities;

secondly, the criteria applied in assessing the quality of education differ from the goals and objectives of socio-economic development of the country, long-term forecast parameters of economic development, the impact of technical and technological innovations on the prospects.

Particularly, in the Times Higher Education ranking, 30 % for teaching (the learning

environment) is assigned using the following criteria:

– Reputation Survey: 15 %;
– Staff-to-student ratio: 4.5 %;
– Doctorate-to-bachelor's ratio: 2.25 %;
– Doctorates-awarded-to-academic-staff ratio: 6 %;
– Institutional income: 2.25 % [23].

As one would expect that the results of surveys, such as an increase in the number of teachers with academic degrees, do not allow objectively assess the situation, despite the fact that the country's development strategy of the higher educational institution in some way helps to determine its place in innovative activities;

In the third place, the inclusion of citations in research papers as key indicators provides additional opportunities for English-speaking scholars. Essentially, citations should serve to assess the role and importance of higher educational institutions in disseminating new knowledge and ideas. However, determining the rating indicators: a) results of the Academic Reputation Survey; b) publications in prestigious academic journals, c) the introduction of indicators such as the number of employees who have received an international award in the higher educational establishments may lead to an objective evaluation of scientific work.

Specifically, as is stated in the methodology of The Times Higher Education, "…We examine research influence by capturing the average number of times a university's published work is cited by scholars globally. This year, our bibliometric data supplier Elsevier examined more than 108 million citations to 14.4 million journal articles, article reviews, conference proceedings, books and book chapters published over five years. The data include more than 24,600 academic journals indexed by Elsevier's Scopus database and all indexed publications between 2016 and 2020. Citations to these publications made in the six years from 2016 to 2021 are also collected" [24].

This will lead to an increase in the number of citations to scientific publications based on general and methodological issues, as well as the experience of developed countries, and problems at the national and regional levels will be lost sight of world scientists.

In particular, it is important for Uzbekistan to resolve the existing problems at the national level. At the same time, using experience of the world or developed countries in solving problems at the national level poses further problems. As a famous Scottish scientist, A. Ditton, a 2015 Nobel Laureate in Economics and a professor at Princeton University states, "The effectiveness of a scientific approach in one situation does not mean that it works in other situations in the same way." In this regard, we must recognize that the priority given to international scientists and scientific literature in the preparation of scientific papers is one of the factors that ensure their publication in foreign journals, as well as such a method has become an undisputed tradition in developing countries;

Fourthly, the evaluation of Citations (30%) by the results of Reputation Survey (18 %), Research Income (6 %) and Research Productivity (6%) in the ranking does not allow to objectively assess the level of research support.

In particular, Industry Income Score of the University of Oxford which came out top in the rankings of Times Higher Education was 74,4%, that of Harvard University was 48.9%, University of Cambridge got an Industry Income Score of 56.7% and Yale University scored 56.2 %. However, Tsinghua University, which ranked 17th in the ranking, had a 100 percent rate, followed by the Massachusetts Institute of Technology (6th place) and Johns Hopkins University (13th place) with 93.7 percent [26].

Research in integration processes, in our opinion, should be continued with an analysis of the requirements of economic entities and the criteria set for the knowledge and skills of graduates in the curricula proposed by higher educational institutions.

The requirements for the analytical vacancy in the sphere of investment banking for February 2022, posted on *Indeed* by Morgan Stanley, one of the leading banks in the United States, are as follows: Full Job Description "You're ready to bring your knowledge from the classroom to the boardroom; and Citi wants to help you get there. Whether it's honing your skills or building your network, we know that success can't come without growth. Our programs equip you with the knowledge and training you need to play a valuable role on your team; and establish a long-term career here. At Citi, we value internal mobility, and career growth is not a question of if, but when. Citi's Institutional Clients Group (ICG) is looking for Summer Analysts to join the Banking, Capital Markets and Advisory Investment Banking team in NAM. The Investment Banking group provides sector expertise and strategic advisory solutions, including mergers & acquisitions, capital raising and other strategic financings to corporate, financial service and public sector clients" [27].

A student who has successfully passed the Program Specification 2021–2022 Economics, Management, Finance and the Social Sciences (EMFSS) Banking and Finance BSc program at the University of London, UK, locate, extract, analyze and draw reasoned conclusions from multiple sources (including electronic sources) of appropriate literature and relevant data and acknowledge and reference sources appropriately; critically analyze arguments; assimilate and lucidly evaluate alternative views [28].

Conclusion and Recommendations

Based on the research, the following conclusions can be drawn:

Firstly, higher educational institutions and economic entities have specific strategic purposes. We feel that these strategic purposes are consistent with the priorities set for higher education and economic entities. In particular, higher educational institutions provide students with the knowledge and skills to help them develop relevant knowledge and deep motivation as citizens, critical thinkers, problem-solving skills, finding and resolving problems, as well as social responsibility. In this case, the conformity of strategic tasks will require the establishment of academic mobility links with higher education institutions with a specific specialization, economic entities and higher education institutions that train specialists in high technology. However, it remains unclear which organization will initiate this process; secondly, the change in the models of activities of higher educational institutions requires establishing close cooperation with business entities, government agencies and public organizations. So, higher educational institutions will have to take into account the current and future state of these integration relations in developing strategies, implementation of education and research. However, as a result of relying on a well-defined specialty in the educational process or scientific research, as well as empirical and other similar retrospective research methods, there is a decrease in the quality of work and non-compliance with long-term requirements of customers; thirdly, the expected goal of integration processes in higher education is to improve the quality of education, to raise its rating at the international and national levels through the commercialization of research productivity. At present, providing a long-term level of financial stability and competitiveness is one of the important tasks of the real sector. In such a situation, integration should emerge at the intersection of the interests of different organizations; fourthly, the transition processes taking place in the economy require forward-looking interdisciplinary research in higher educational institutions. Specifically, the ability of higher educational establishments to compete on an equal footing with the practical developments of high-tech companies in terms of their quality, relevance and level of implementation remains low; fifthly, important steps taken by high-tech companies to attract young talented students and scientists cause a decline in the scientific potential of higher

educational institutions. Besides, the actuality of the views expressed by the academic community in assessing the level of higher educational institutions and research results in determining the relevant ratings have a negative impact on their practical significance.

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