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The role of universities in global development: present and future

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Abstract

Based on current trends and demographic forecasts, the present paper assesses the role of universities in global development and its dynamics for the coming decades. The role of universities is considered in view of changing the demographic situation and the global convergence process, that is, the gradual approximation of the development level of advanced and developing countries of the world. It is shown that demographic processes, economic development and global convergence have a key impact on the development of universities. It has been shown that digitalization is no longer a challenge for a traditional university.

Keywords: Universities, Global, National and regional development, Digitalization, Education.

El papel de las universidades en el desarrollo global: presente y futuro

Resumen

Basado en las tendencias actuales y los pronósticos demográficos, el presente trabajo evalúa el papel de las universidades en el desarrollo global y su dinámica para las próximas décadas. Se considera el papel de las universidades en vista de cambiar la situación demográfica y el proceso de convergencia global, es decir, la aproximación gradual del nivel de desarrollo de los países avanzados y en desarrollo del mundo. Se demuestra que los procesos demográficos, el desarrollo económico y la convergencia global tienen un impacto clave en el desarrollo de las universidades. Se ha demostrado que la digitalización ya no es un desafío para una universidad tradicional.

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Palabras clave: Universidades, Desarrollo global, Nacional y regional, Digitalización, Educación.

1. INTRODUCTION

The digital era brought an idea of the 4th industrial revolution and at the same time the new role of the University in the digital age. The University 4.0 concept appeared in 2011 in a collective monograph edited by Robert Barnett, an emeritus professor at the Institute of Education, University of London. If University 3.0 - "an entrepreneurial university" was "a university for itself", then University 4.0 ("ecological university") is called to become a "University for others". On the other hand, the role of universities has always been rather conservative and boiled down to the following positions:

Training highly qualified personnel: A traditional role that has been increasingly enriched recently by "adult education", or speaking in terms of the Soviet period of history, advanced training and professional retraining;

Education: Young people at universities undergo socialization, a school of professional and life communication, gain mentors and role models, grow spiritually and physically, in the worst case universities become a kind of "bank" for youth to mature to a more or less adult state; at best - real centers of youth policy in the city and region (and sometimes the country).

Science and inventions: This role has also always been inherent in universities; in a number of technologically advanced countries, centers for scientific development and innovation are universities, and not separate research organizations or technological valleys. In fact, these innovation centers and research institutes in recent decades have been created at universities, and universities are based in centers that were originally created as innovative;

Centers of dialogue: Centers of interregional and international cooperation, guides ("logistics centers") for knowledge, competencies and technologies, communication centers of present and future elites, accelerators of vertical and horizontal mobility;. Regional development centers: Research and "brainstorming" for strategic decisions, specific innovations, education, culture, science, sport, politics - in the sense of a scientifically based dialogue of different points of view on development; finally, universities are quite ready to try on a new role - centers of intellectual management (city, region, company, industry, country).

Digitalization, which is usually associated with the emergence of the University 4.0 concept, as a relatively new global process has introduced new trends in the development of the university, it facilitated the implementation of all the above university missions, facilitated the integration of the university into the shaping ecological system; does it really affect the appearance of new missions? Perhaps, demographic processes have and will have a much stronger and more substantial impact on universities. Based on the foregoing, the aim of

the research is to develop reasonable assumptions about the current and future role of the university in the life of countries and society, based on demographic macro-processes in terms of the formation and development of the University 4.0 concept.

2. METHODOLOGY

Demographic development indicators and numerical indicators of the University development as a social institution and individual national higher education systems were considered in a dynamic manner in the range from several decades to several years. For analysis, we used data on the number and age structure of the population, data on the number of students in different countries, economic indicators, indicators of the age structure of workers in higher education.

3. RESULTS AND DISCUSSION

Population growth, youth and university development:

The growth dynamics of the Earth's population is gradually decreasing. If between 1990 and 2000 the world population grew by 15%, then between 2000 and 2010 - by 13%, and between 2010 and 2020 - by less than 12%, and in the next decade - it will grow in the forecast by only 9,6% (Population Pyramids of the World from 1950

to 2100). Naturally, with such a slowdown, the proportion of young people will decrease (Table.1).

Table 1: The share of youth in the world and on some continents from the end of the past to the middle of this century (forecast)

Year	Share of youth 15-24 years, the whole world	Share of youth, 15-24 years, Europe	Share of youth, 15-24 years, Asia	Share of youth, 15-24 years, Africa
1990	19%	19%	20,2%	19,1%
2000	17,7%	14,5%	18%	19,9%
2010	17,5%	11,1%	18,2%	20%
2020	15%	12,7%	15%	19,2%
2030	15%	10,2%	14,5%	19,7%
2040	14,5%	10,8%	13,5%	19,1%

Data source: World Population Pyramid from 1950 to 2100 (https://www.populationpyramid.net).

In the USA this share is currently 13%, however, in the PRC it is already 11%, in Germany this share is already 9.8%, in Italy - 9.6%, in Russia - 9.4%, in Japan - 9.3%. If in Russia and China a slight increase in the share of youth of 15-24 is still possible in the coming years, in Germany and Japan it is possible only due to an unprecedented massive influx of migrants. In general, in the future, apparently, the decline in the proportion of young people will continue. This is important because a decrease in the share of young people leads, on the one hand, to a reduction in threats to social instability, and on the other hand, to a reduction in the possibilities of innovative development.

Moreover, according to UNESCO, the number of university students is growing rapidly. If the total number of university students in the world in 1950 amounted to only 6.5 million people, then in 1998

it exceeded 88 million people (Vsemirnyj doklad po obrazovaniyu 2000) and since the beginning of this millennium 2015 has more than doubled, exceeding 212 million people (Global education monitoring report, 2017). Two of these trends - a decrease in the number of potential students for traditional higher education and an increase in the number of students should find a certain intersection point in the foreseeable future, beyond which stagnation in providing the world economy with highly qualified personnel will come. True, the global world of education will avoid simple solutions, and try to improve not the quantity, but the quality of education by not so much trying to saturate the years of study in bachelor and master programs with denser streams of knowledge transferred to the student, but rather establishing the learning process of the university pupil throughout his professional life.

Professor John Dewar, vice chancellor and president of La Trobe University (John Dewar), believes that University 4.0 will have four features related to the previous thesis: learning in several modes (including remote), with smooth switching between these modes; the transition from degrees (bachelor, master, doctor ...), as the only form of qualification, to their more diverse offer, including the results of fairly short training cycles, and finally, the transition to managing students' careers during their studies at the university and after they become graduates, the distinguishing feature of which will be the “ability to” replenish “standard university qualifications throughout their working lives”. Digitalization facilitates communication, but at

the same time, it is precisely for demographic changes that the main stimulus for the innovation of university nature should be recognized.

Large developing countries have long been leaders in the number of university students. According to the Organization for Economic Cooperation and Development, India and China will count for half of all university graduates in the world aged 25–34 years by 2030, and less than 25% in Europe and the USA (VYSSHEE OBRAZOVANIE V EVROPE. 2017). In general, this trend reflects the global process of convergence of development levels of countries and regions of the world, which began in the 70s of the last century (AKAEV A.A. 2015). This process is visibly observed everywhere: in politics, in culture, and, of course, in economics. At the beginning of this century, approximately 95% of the companies included in the Fortune Global 500 world business rating were geographically located in the so-called developed countries. However, by 2010 their share decreased to 83%, and by 2014 - to 69%.

By 2025, this figure is expected to be 54% (Kulen, Robert) McKinsey consulting company in its reports suggests that in 2030, 66% of the middle class will live in the Asia-Pacific region. Today, the largest universities in the world (with a number of students of several million each) are located in developing countries - India, Bangladesh, Turkey, Pakistan, etc.

3.1. The main mission of the University is training, problems of Russia and Europe

Russia is in the midst of an acute shortage of young personnel. Today, young people born already in the 1990 graduate from universities, the most capable of them go to graduate school, go to science, but it was in the last decade of the 20th century that Russia experienced severe social stress, expressed in an unprecedented "hole" in the number of children born. If in 1987 almost 2.4 million boys and girls were born in the Russian SFSR, then already in 1996 - only a little more than 1.2 million. This could not but affect the current situation. In the coming years, we are still losing tens of thousands of people in the number of scientific and pedagogical staff, and this does not correspond to the level of developed countries, which will greatly complicate the task of ensuring a scientific and technological breakthrough for our country.

The number of students in Russian universities has been declining for the tenth year in a row. The peak was in 2008, when the student population exceeded 7.5 million people. In 2017 it decreased to 4.2 million that is, decreased by 44% compared to the peak value. A decrease in the number of students, based on the demographic forecast of Rosstat, up to 2024 we should expect that 3.7-3.9 million students will study in Russian universities (SEMENETS, A. 2018).

Personnel hunger expressed in the shortage of both the most qualified personnel and ordinary workers, is becoming increasingly

apparent. Measures are obvious: it is advisable for Russian universities to increase the amount of additional education and retraining of adults, attract foreigners, and work hard with schoolchildren so that in the coming years they can join the ranks of those doing research right from the first University courses, without waiting for their completion. Today universities, especially in developed countries, are becoming not only centers where adults teach and educate young people, but centers of professional development for all categories and ages of specialists, centers of "attraction" of society.

Whether or not Europe faces a severe crisis in staffing for economic development, about which world reports have been written (Forty million jobs needed), as well as domestic researchers? (ANDREEV A.I. 2017). Indeed, the number and proportion of youth in European countries is declining, and in a few years there will come a time when the proportion of those entering the age of the profession will be almost universally lower than that of those retiring. However, increasing the number of skilled youth can solve the problem of labor productivity and the inevitable stagnation of the economy.

From 2013 to 2017, the number of undergraduate students in European countries (including Turkey, without Russia, Ukraine and Belarus), the number of undergraduate students increased from 15.7 to 16.7 million, by 6.5%, the number of undergraduates - from 6.04 up to 6.27 million, by 3.8%.

The group of leaders in the number of future bachelors in Europe was Turkey (3.95 million, an increase of 29.5% compared with 2013),

Germany (1.86 million, an increase of 13.7%), and the United Kingdom (1.6 million, an increase of 4.6%), Spain (1.2 million, an increase of 12%), Italy (1.1 million, a decrease of 0.6%), followed by France (1.04 million, an increase of 12%) and Poland (1.03 million, a decrease of 19%). Germany (1.03 million, an increase of 11%), France (923 thousand, an increase of 11%), Italy (697 thousand, a decrease of 4.2%), Turkey (598.5 thousand, an increase of 90%), Poland (479.6 thousand, a decrease of 18%) and only then comes the United Kingdom (Eurostat database).

It seems that everything is in order with the staffing of the housekeeper, however, we note that Turkey alone provides a 90% increase in the number of undergraduate students and (with a small margin) the entire increase in the number of European graduate students. Thus, concerns remain. Of course, there is a resource by increasing youth employment. It grew from 2013 to 2017 by an average of 4.5% for young people of the first post-graduate age - from 25 to 29 years. The average employment of older youth in European countries reached 76.2% in 2018. In key European countries, growth was 5.2% in the UK, 2.5% in Germany, 7.2% in Spain, 1.8% in Italy and only the proportion of employed senior youth in France was not marked by growth (Youth employment rate by sex, age and country of birth).

The number of the most qualified graduate students has grown to 897 thousand by 5%. The leaders in the supply of future highly qualified scientific personnel: Germany (198.3 thousand in 2017, a decrease of 7% compared to 2013), the United Kingdom (112.3 thousand, an increase of 3%), Turkey (91 thousand, an increase of 13%), Spain (71.5 thousand, an increase of 202 (!)% compared with 2013),

France (66.9 thousand, a decrease of 4%), Poland (43.2 thousand, 2% increase). Interestingly, in Italy, as a result of a 20% decrease since 2013, the number of graduate students has become 27.7 thousand, which is less than in Greece (28.7 thousand, an increase of 24% over the indicated period).

The increase in the number of graduate students by 44 thousand in recent years is more than covered by a sharp rise in Spain - almost three times, which, of course, requires a separate study. In general, large and scientifically and economically leading countries either practically did not increase the number of graduate students, or even somewhat stagnated on this indicator. However, a number of small developed countries had significant growth - the Netherlands (by 11%), Belgium (by 16%), Norway (by 10.4%), a number of "new" EU countries and developing European countries showed significantly more impressive growth (Serbia - 83%, Malta - 91%, Cyprus - 62%), but their share in the production of scientific personnel is small.

Thus, despite the signs of personnel shortages in Europe, universities help cope with its signs. Serious measures are required in Russia to increase the number of students.

3.2. Universities: youth centers

Education is a complex of training and leaning. Education, which, in turn, is called "non-formal learning" in the Western scientific tradition, is built on mentors and leaders, and it is better that

they include people who communicate well with young people, who can become older comrades rather than mentors for young people. Demographic changes can play a key role in shaping the problem field of this important area of the University's activities, let us show this using the example of Russia.

In recent years, along with the stabilization of the number of researchers in Russia and an increase in the share of young people among them, there has been a rapid decline in the number of faculty members of universities that are also engaged in science and innovation but formally relate to education. So, if in the 2005/2006 school year the number of university professors in Russia exceeded 350 thousand, then in 2017/2018 academic year it does not reach a total of 250 thousand. Moreover, if the influx of young people into the research sphere is formally large enough, and the proportion of young people under 39 working at research rates, under certain scenarios, can reach 50% in a few years, which will cause a significant renewal of teams and an influx of fresh approaches to work, then in universities, the situation is radically different (table 3).

Table 2: the structure of the number of faculty of Russian universities (without part-time workers and working under civil law contracts)

Academic year	Borders of age cohorts					
	Up to 25	25-29	30-39	40-49	50-59	60 and older
2010/2011	2,3	9,5	24,4	18	20,9	24,9
2012/2013	1,7	8,2	24,8	18,4	20,7	26,2
2013/2014	1,5	7,6	24,6	18,6	20,6	27

2014/2015	1,4	7,1	24,4	19,2	20,5	27,4
2015/2016	1,1	6,5	23,9	20,3	20,3	28
2016/2017	0,9	6	23,4	21,6	19,8	28,2

Source: Education Indicators. HSE, 2018.
URL: https://www.hse.ru/data/2018/12/14/1144745709/io2018.pdf, p. 269.

As can be seen from the table, there is a rapid decrease in the share of youth of all ages in the teaching staff of universities in the current decade. Meanwhile, effective educational work aimed at the continuity of Russian professional and civic values and traditions can be realized only with a close dialogue of generations, most effective with a relatively small difference in the ages of teachers and students. In addition, the development of the teaching component of the process in higher education is impossible without the influx of innovative technologies and competencies, the most effective with a significant proportion of young people in the professional community.

Many young teachers, especially in regional universities, having fresh ideas about the modernization of the educational process, while developing the process of impoverishment of their teams by young people, are often left alone without moral and effective support in the environment of older colleagues, somewhat frozen in view of creative and personal development. To improve the quality of extracurricular activities with the support of young scientists, it is necessary to develop the support of young teachers.

3.3. International Education: Current Trends

The number of students studying abroad is growing: in 2017 there were 5.3 million of them in the world, which is more than 2 times more than at the beginning of this century.

Table 3: International Students - Comparison of the situation in 2013 and 2017

	Host region (country), thousand		Ratio of the level of 2017 to the level of 2013,%	Guide region (country), th. The ratio of the level of 2017 to the level of 2013,%		Ratio of the level of 2017 to the level of 2013,%
	2013	2017		2013	2017	
The whole world	4231	5309,2	25,5	4231	5309,2	25,5
Europe	1786,8	2107,3	18	864,7	978,1	13
North America	935,8	1195	27,7	124	137,6	11
Asia	852,6	1131,5	32,7	2022,1	2701,9	34
Africa	203,6	224,1	10	424,9	542,8	27,7
Latin America	153	209,5	37	265,8	342,8	29
USA	784,4	984,9	25,6	75,6	86,6	14,4
PRC	96,4	157,1	63	719,4	928,1	29
Russia	213,3 *(2014)*	250,7	17,5	51,5	56,7	10

Source: UNESCO Institute for Statistics http://data.uis.unesco.org/

As can be seen from the table, the number of foreign students has grown over the past 4 years by a quarter, which is even faster than the overall increase in the number of students in the world. Such intellectual migration, albeit temporary, is an important part of the dialogue between countries and their cultures. For developed

countries, this is an opportunity to overcome staff shortages; for developing countries, it is an opportunity to gain knowledge, competencies, and technology.

The leader among the centers for attracting foreign students - the United States - also increased their number by a quarter, while the number of Americans studying abroad is first more than 10 times less than the number of foreign students in the United States, and secondly, it has grown slightly in recent years. Europe is also a world center of education, its countries accept more than 2 times more students than the United States, but also send more than 10 times the United States to study in other regions. In terms of the number of students being sent among all continents, the absolute leader is Asia, which supplies half of all students abroad (and this number is growing, even faster than the global pace).

At the same time, the role of Asian universities as a center of attraction for foreigners is also growing - also faster than the global pace, while their number is 2.5 times less than directed. Africa has the same ratio in favor of sent students; however, their number is 5 times less than in Asia. The development of Africa as an educational center is still much slower than the Asian and world average. Unlike Africa, Latin America, which has 2 times less population, is developing as a world center of higher education very rapidly in terms of sending students abroad, and more importantly, in terms of attracting them from abroad.

4. CONCLUSION

Thus, the presented results and their discussion indicate that the University as a social institution is currently at the peak of its development dynamics, primarily in terms of the number of students, which will probably fade somewhat as the proportion of young people in the world's population decreases and global convergence develops. It is shown that demographic processes, economic development and global convergence have a key impact on the development of universities. It has also been shown that digitalization is no longer a challenge for a traditional university.

The global development processes of leading universities keep up with the next industrial revolution. The Humboldt University 1.0, which is mainly engaged in education, was replaced by University 2.0 - a research university, and then University 3.0 - an entrepreneurial university that sells services and implements the function of technology transfer and delivery to end users. Today, the leading universities in the world are Universities 4.0, which implements the function of generating forecasts, an image of the future, and a provider of knowledge about it. University 4.0 is becoming a leader in the development of high-tech industries.

One can make a "forward move" and proclaim University 5.0, which should become the center of smart management, forming not only the image of the future, but also calculating the ways to achieve it, strategic planning, management, development and scientific

substantiation of specific possible scenarios - on a global, national and regional levels. The issues of the choice of possible scenarios, task setting and operational management remain in this concept for the state, but the involvement of scientists not only in the development, but also in the detailed elaboration of scenarios for achieving strategic goals today, in our opinion, is extremely necessary, since even the most reasonable and justified images future, formed by the best minds, can remain so without the appropriate scientific and personnel support.

The way out is seen in an interdisciplinary approach that can only be fully provided by the University.

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