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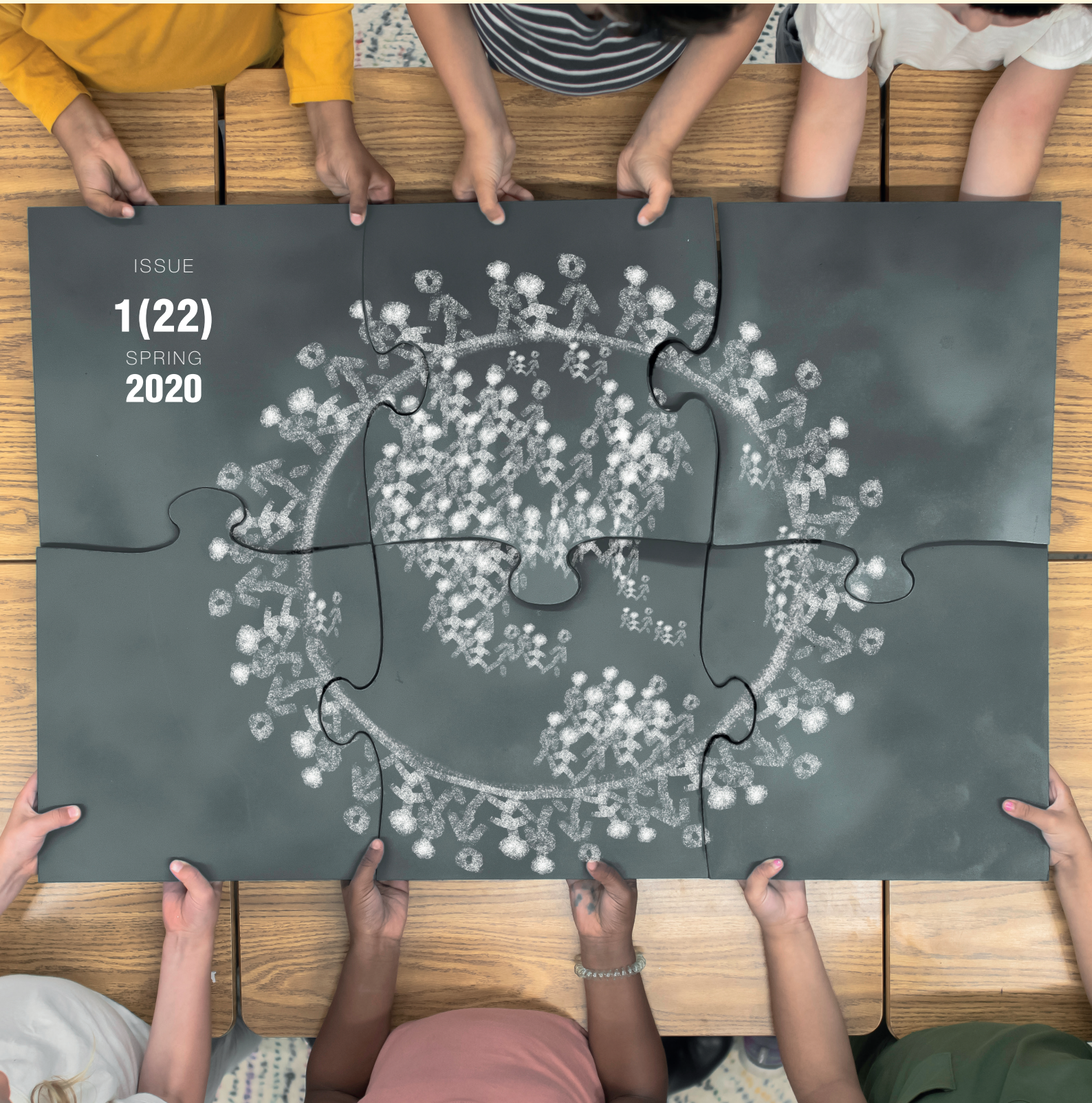
Demographic Trends in Higher Education



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The Access of Rural Youth to Higher Education in Poland

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The dynamic changes of higher education (HE) in Poland captured the attention of scholars due to the rapid expansion of private sector. However, little attention has been paid to the problem of inequalities in access to HE, as if the numerous private HE institutions would resolve this issue. This appears to be far from the truth. The expansion of HE caused the number of young people entering HE increased from 9.8% (in 1990) to 38% (in 2005) setting up Poland on the fast lane to a High Participation System of Higher Education [1]. This would not be possible without great demand for university degrees, which was additionally driven by the demographic growth in secondary school leavers and the development of the external and internal privatization of HE [2]. Since 2010, the demographic trend has reversed with a rapid decrease in student numbers. This process commonly known as 'the demographic tsunami' [3] attracted massive public attention but its impact was only superficially examined with a narrow focus on the financial consequences of the decreasing number of students. This study explores the consequences of the demographic low on rural youth's access to full-time programs at public universities.

Public higher education in Poland

Polish HE offers both tuition-free and tuition-based forms of higher learning. There are 1.23 million students in Poland, majority of which (58%) study full-time at public universities while the others have to pay. One of the foundations of Polish HE is that studying at public universities is tuition-free for full-time students. There are also tuition-based forms of HE provided by both the public and private sectors. There is shortage of national data on rural youth although Statistics Poland [4] estimates that approximately one-third of the student cohort comes from the countryside unfortunately without specifying their distribution between tuition-free and tuition-based programs.

Public universities in Poland are financed by almost entirely by the central government (80% according to GUS). The size of the lump sum grants are calculated on the basis of multiple factors among which considerable weight is given to the number of full-time students. Such an algorithm creates a strong incentive for universities to maintain a stable level of, or increase, enrolment. For the sake of this study, it is important to acknowledge that studying full-time at public universities has been a privilege used most frequently by middle class students from urban areas.

Inequalities of higher education in Poland

Sociological studies on the inequalities in access to HE have a long tradition in Poland. The major inequality is the urban/rural location as this has always marked a significant difference in access to HE [5]. This gap stems from the fact that after WWII, the modernization processes in Poland took place mostly in urban areas which affected the infrastructure in rural areas. It produced a sharp divide between urban and rural areas in education, as the latter was characterized by the relatively low aspirations of rural youth, lack of educational infrastructure and relatively less qualified teachers [6]. Only, recently, has it begun to change due to flow of EU funds, which triggered the deep structural modernization of rural areas which, among other things, increased the educational aspiration of the younger generation.

Methodology

This study is empirical by nature and it rests upon data obtained from USOS (universities student database) at each of investigated universities separately. It covers the population of full-time students studying 2006-2018 at public universities which were selected in order to illustrate wider categories. These categories were distinguished by the use of two factors (a) size of city (metropolitan-nonmetropolitan) and (b) academic prestige (flagship/medium prestige/low prestige). Such an approach addresses our two major research questions (1) whether and how the demographic decline has influenced the access of rural youth to public HE and (2) what types of universities they attend.

	Flagship	Average Prestige	Low Prestige
Metropolitan	A1	B1	C1
Non-metropolitan	X	B2	C2

In the second phase, the research verifies in which programs rural youth enroll. We assume that non-selective programs would be overpopulated with rural youth while the selective ones remain the bastion of urban middle class. We identified two programs: 'law' representing highly selective programs and 'pedagogy' as a proxy for programs with low selectivity. Both programs also belong to the core of university education offer existing under the same label. It makes comparisons between different universities legitimate.

Results

In the period 2006-2018, the proportion of rural youth among the student cohort at public universities has increased significantly. Paradoxically, the demographic low had bigger impact on rural youth in HE than the expansion period 1990-2005 in which fee-based services prevailed. Naturally, the prime reason for the growing number of rural youth was the specific logic of funding public universities which pushed them to enroll in full-time programs. Second, our findings suggest that the ruralization of Polish HE spread equally to all types of universities regardless their metropolitan/non-metropolitan location or level of selectivity. This contradicts our tentative hypothesis that rural students would be enrolled in non-metropolitan universities of lower selectivity.

The change in the percentage of rural students in the population of full-time students (2006-2018)

	Flagship	Average Prestige	Low Prestige
Metropolitan	8,2 – 18,5	11,3 – 24,7	14,7 – 27,8
Non-metropolitan	X	18,3 – 33,8	23,2 – 36,8

This result is a surprise and the dynamics of this change was highest in A1 universities where number of students with rural background doubled (220%) comparing to an (only) 60% increase in C1 universities. In other words, universities that previously were the least accessible to rural youth reported the biggest change in their enrollment. Finally, the study demonstrates that both selective and non-selective programs increased their enrolment of rural youth. This also goes against our assumption which suggested that non-competitive and therefore non-selective programs would account for the vast majority of rural students which turned out to be a false assumption.

Conclusions

While most studies on Polish HE have been focused on its expansion and in particular the rise of the private sector, the biggest impact on equal access was the interplay between demographics and the funding algorithm of public universities. The previous studies on 'the demographic tsunami' were primarily focused on its impact on HEI in particular the plight of the private sector but surprisingly little is known its impact on inequality in access to HE. Our findings lead to three major conclusions: (a) the number of rural students has significantly increased since the demographic peak (2006), (b) the gap was narrowed in all types of universities and across programs, although differences between different types of universities remain and (c) despite the considerable autonomy of Polish universities, the government remains the pivotal player and can have a far reaching influence on student enrollment.

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The Individualization of Training in Underfilled Academic Groups and Courses: Approaches of a Ukrainian Private Higher Education Institution

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The Ukrainian Context

Over the last 30 years, Ukraine has already experienced the demographic processes which are to become a major driver of changes in the world in the decades to come. There has been a steady towards a drop in the population, resulting in a decrease in the student body. In 1991, the official population of Ukraine was 51,944,000 and for demographic, political and socio-economic reasons it had decreased to 42,153,000 by 2019, with an expected downward continuation for the next few years.

The Number of Higher Educational Institutions and Students

According to the Ukrainian State Statistics Service, between 1991 and 2019, the number of educational institutions (HEI) such as technical schools, colleges, institutes, academies, and universities decreased by 36% to 652 institutions. During the past ten years the number of HEI offering Bachelor's, Master's, and PhD programs has reduced by 48 to 282. The number of students in 2019 was 1.3 million, while in 2010 it was over 2 million people. Private sector of education between 1991 and 2005 featured a steady increase both in the number of private HEIs and the number of students. By the early 2000s, the latter accounted for approximately 11% of the country's student body. Since 2008, there was a drop in the proportion of students in the private sector caused by demographic problems,the state policy on private educationwhereby private HEIs were denied legal equality with public HEI (the situation is gradually changing for the better), and a decline in trust in the quality of education at private HEI. Official statistics show that around 110,000 students were enrolled in the private HEI in 2019.

The number of state-funded students in the public sectorhas steadily declined in recent yearsto 44% of the student body,the remaining 56% are fee-paying students (as compared with 20% and 80% correspondingly by 2000).

Demographic Challenges and their Outcomes

The massification of HE, bordering on universal education, has resulted in a decline in quality globally, although the decline has manifested itself differently in different countries, regions, and systems. Ukraine which opened its universities to people who were by no means always ready for higher education was no exception. With 80-85% of the age group having the opportunity to enroll in university, the inherent elitism of university education could not persist. However, with the current developments, it seems possible to identify other trends and areas of positive growth which can be used to respond to the demographic challenges.

With the current changes, the previous strategies of HE systems do not work well, if at all. Almost all HE systems are being reformed and none of them have been completed. It might not be possible to expect any reform outcomes which bring the HE system into line with the time or, according to Ortega y Gasset [1], fully modernize them. However, educational reforms have also become a constant. It is difficult to rely on the experience of other educational systems and other countries to find solutions. Almost everyone is experimenting to compensate for demographic and other impacts.

Against this background, it seems appropriate to identify common markers and trends in the development of HE and analyze the activities and outcomes of certain universities, especially if they have strategically determined their innovative development.

In this regard, private HEI, their structures and experience in terms of facing demographic challenges are of interest for a number of reasons. First, since most private universities are notlarge, they are more flexible. Their structures are less bureaucratic, and they are objectively more susceptible to change. Second, they initially focused on innovationas they had no state guarantors and had to work out prompt responseson a daily basis.

The Perspective of anIndividual Private University

As mentioned, HE systems differ significantly, as do individual universities. Here we focus on the strategy for compensating demographic challenges offered by an innovative private educational institution operating in Ukraine. The first challenge is the smaller student body, a drop in the quality of their pre-university training, and a noticeable decrease in academic motivation at the initial stage resulting in the need for changes in educational processes and teaching methods. The second challenge is the ill-preparedness of university teachers to work under such conditions, the lack of understanding and willingness to accept the current developments, and the stress caused by working under constant changes making academic staff reluctant to embrace the reforms.

The issue of academic staff is beyond the scope of this paper, since our objective is to focus on the ways to face the above two challenges by means of a case study of small private educational institution operating in a large university center.

Individualization of Training and Under filled Academic Groups

The smaller student body and the lack of scholastic skills necessary to acquire a modern higher education calls for measures that would help prepare the student to meet university requirements, rules, and culture. University-based preparatory courses play a positive role in this adaptation process. However, there is a decrease in the popularity of such courses and the number of students attending them, brought on by the introduction of external independent evaluation (EIE), a sharp surge in tutoring and the setting up of various school-based EIE preparatory courses.

The university responded to this challenge by introducing a special educational and training course "The Basics of the Student's Life". Initially, it was a five-day course; however, experience showed that the course could be reduced to 2-3 days. Its current content and formgive new students aninsight into the organization of the educational process, university rules and traditions, approaches to studentresearch activities, the organization of student self-governance, etc. The course program includes lectures, excursions, training sessions, and quests and its implementation is largely the task of the Master's students.

The underfilled academic groups, which have 5-10 people as opposed to the traditional 25-30, have brought about new approaches to class scheduling, the introduction of

multi-year and multi-program classrooms, an increase in the share of training sessions, individual work, and project tasks. From the financial and economic point of view, such changes are ambiguous, since, while they allow the university to optimize costs by integrating academic subjects and levels, the changes increase costsas individualization is more cost-intensive.

As things stand, the transition to smaller academic groups is a forced measure taken to optimize costs while preserving, if not developing, the dialogue culture which underlies any quality higher education, and to work out individualized study programs.

Earlier, the university tried adopting a 'floating' examination period which enabled students to take exams and get credits as and when they were ready. However, the experience was far from positive and the 'floating' examination period was discontinued. Proving more viable have been weekly catch-up classes and one-to-one tutorials included in the teacher's academic load, mandatory in-term and end-of-the-term catch-up classes for low-performing students, follow-up examination periods and other educational activities.

In this regard, the demographic challenges and the drop in the quality of the students' pre-university training did not result in a sharp increase in the dropout rate, the annual figures of which range from 4.5 to 10%.

Smaller academic groups and the overall smaller student body have significantly changed the formation of micro-groups and the speed of embracing the cultural and educational environment of the university. In order to optimize this, and preserve and further develop the academic ethos the university introduced 'scholarship programs' to attract high-achieving school graduates and offer them fee-free education. Such scholarship programs, completely covering the costs of a Bachelor's degree were offered by the university alumni. The presence of high-performingand socially activity individuals in academic groups promotesthe academic motivation of the whole group.

Management which is slow to change despite a real increase in university autonomy and the unwillingness of academic staff to embrace the culture of change still appear to be the main obstacles to changes in educational activities based on the principles of small academic groups and workable individualized educational paths.

However, the complexity of the tasks does not mean that they should not be solved at all. The impact of demographic challengesis increasing; universities will have to work out how to face them sooner or later.

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Unveiling Turkmenistan's higher education enrolment growth and internationalization efforts

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Introduction

Turkmenistan is perhaps the most mysterious post-Soviet country. This Central Asian nation of almost six million people is rich in history, culture, and natural resources. Turkmenistan has achieved enviable economic growth: its GDP has grown 14-fold in the last twenty years (from $2.9 billion to $40.8 billion). Despite that tremendous growth, higher education (HE) enrolment is comparatively low and very little is known about its HE sector due to the lack of reliable, up-to-date, and readily available statistics. This article highlights some features of Turkmen HE, its evolution since independence, and the steps taken to boost university enrolment and internationalize its education.

Sharing the common heritage of the Soviet era, Turkmenistan enjoyed high literacy rates at the time of independence in 1991. Based on the premises of a command planned economy, HE institutions taught students in specialized professional occupations tightly linked to the industries and sectors of the economy. University research was tightly coupled with specialized research institutions under the National Academy of Sciences (e.g., the Institute of Geology, the Institute of History) and in collaboration with other Soviet institutions.

The expansion of the population and HE networks

Historically, the population growth rates increased from the 1950s, until the early 1990s when the USSR collapsed. The growth rates plummeted shortly after independence which can be partly explained by the dramatic outbound migration of the non-Turkmen population in the early 1990s, and low birth rates. Only a decade after 1991, did the population growth rates stabilize and have since demonstrated an incremental albeit slow growth, reaching the current 1.27%. Throughout the history of Soviet Turkmenistan, HE enrolment rates were modest at best. In the 1960s, for every 10,000 citizens, there were 100 students (or 1% of the population); this figure grew to 177 students in 1989.

In the thirty years since independence, Turkmenistan's population has grown from 3.68 million in 1990 to an estimated 6 million in 2020, a 64% increase. Meanwhile, the population is very young: the average age is only 26.9 years. In these conditions, the HE system has had to respond by expanding its network. This was done by establishing new institutions and splitting existing universities. For instance, the former Turkmen State Polytechnic Institute had been reformed into two separate HEIs, namely, the International University of Petroleum and Gas and the State Institute of Architecture and Construction. As a result of this response to population growth and rejuvenation, the number of HEIs in Turkmenistan has increased to satisfy the growing demand from 9 in 1991 to 27 in 2017.

HE in Turkmenistan has several notable features. One of them is the prevalence of institutes specializing in certain sectors (e.g., Energy Institute, the Institute of Transport and Communication). There are 5 military institutions, 6 comprehensive universities and, notably, no private universities in Turkmenistan. Because of the highly centralized system, the response of HE to demographic changes was chiefly the orchestrated by government policy rather than by institutional efforts. Currently, all HEIs in Turkmenistan are supervised by the Ministry of Education, except for military and diplomatic HEIs that fall under their relevant ministries.

The post-independence period for Turkmenistan was the most challenging for the education sector in the new market economy. The financial and human resource allocation required consideration of the number of students admitted, the number of teaching hours, requirements for hiring qualified teachers, supplies of study materials, and other expenses. The regulation of the education sector also required a revision of the national curriculum and an update of textbook content. However, while the content of university curricula was altered to reflect advancements in educational IT and the new ideology of the independent nation, its formulation is a highly regulated top-down process. As such, the Ministry of Education of Turkmenistan sets the curricula for all HEIs.

Current situation

Today, the World Bank classifies Turkmenistan as an upper-middle-income country. Its rich natural energy resources and minerals drive the national economy. Education spending is increasing in absolute terms but remains low as a percent of GDP (3.05% in 2012) in comparison with OECD countries (4.5%). The outstanding growth of the economy did not translate into the massification of HE. Until recently, university enrolments were extremely low. Based on 2014 data, UNESCO shows low college-going rates (7.95% of the age group), particularly for women (6.2%).

In the last three years, however, the picture has changed dramatically. The number of college-age citizens (18-22 years old) is close to a million or 15.8% of the total population. While university enrolment as a percentage of this age group remains low, the number of students attending HEIs is increasing. Notably, in the 2019-2020 academic year, the total number of students admitted into HEIs in Turkmenistan was 12,242, which is 3,392 more than the 2018-2019 academic year, which was an increase of 32% over the 2016-2017 academic year. Additionally, from the academic year 2019-2020, undergraduate and graduate programs in most HEIs in Turkmenistan became fee-based, and 8,054 students were admitted.

The rates of university enrolment could have been higher, but there is an artificially created barrier to accessing HE. The government sets annual quotas for the total student intake, which precludes some youth from entering HE. One unintended consequence of such a policy is that many young Turkmens choose other countries (Turkey, Russia, China, and India among others), to pursue HE. Unofficial sources claim that about 60,000 Turkmens are currently studying abroad.

Another challenge is the need to shorten the gap between male and female educational attainment in general and in HE in particular. While notable success in decreasing literacy rates for women has been achieved: illiteracy rates for females over 15 years old has decreased from 22.9% in 1995 to 7.84% in 2015, there is still a considerable gap in education levels of men and women in the country. While no recent official data was found, according to World Bank data, in 2014, university enrolment for women was 36% less than for men (6,2% vs 9.7%).

Conclusion

Like other countries, and, perhaps even more so, Turkmenistan needs to adapt to its growing demographics and the needs of a comparatively young population. As HE enrolment is still low, the Turkmen government seeks to expand the institutional capacity of its universities and increase enrolment. Stemming naturally from the increasing young population, the growing demand for HE has led to such unprecedented innovations as the introduction of fee-based education in 2019 and the expansion of Bologna-styled academic programs. However, serious challenges such as grossly misbalanced student mobility, the artificially imposed government caps for enrolment, and the significant gender gap continue to hinder the country's education development.

References and notes:

[1] As noted above, except the military and diplomatic ones.

The Interplay of Higher Education and Demographics in Kazakhstan

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Higher education (HE) enrollments are affected by a multitude of factors, population demographics chief among them. This article offers a novel approach to understanding the interplay between population demographics and HE in Kazakhstan by suggesting three distinct periods of interplay between HE and population demographics. The periods are 1) the decade of massification and the growth of private HE (1995-2005), 2) the decade of enrollment decline and university closures (2006-2015), and 3) the decade of projected growing enrollment (2016-2026).

Kazakhstan's demographic outlook

Kazakhstan is a sparsely populated geographically large country of 18.4 million people. Despite being the 9th biggest country in the world, Kazakhstan is 64th in population size and only 184th in population density. Sharing similar socio-economic challenges as other post-soviet countries, Kazakhstan experienced dramatic changes in its demographics following the collapse of the USSR.

In the early 1990s, Kazakhstan faced the massive emigration of mainly non-Kazakhs to their ethnic motherlands. More than three million individuals (most of them of Slavic origin) left the country in the 1990s. These changes were evident from the available census data. The latest census conducted in 1999 showed a 1,250,000 or a 7.7% decrease from 1989. The population of Kazakhstan in 1999 was close to its population in 1979. This "brain drain" left Kazakh HE with a serious human resource challenge because many of those immigrants were highly educated constituting the core of the university professoriate.

To make things worse, government spending on education declined significantly and remained extremely low for the 15 years following independence.A market economy and the neglect of HE by state authorities made the traditional ways of operating in HE inefficient (OECD, 2007).

This process was also accompanied by a severe decline in birth rates, which increased only in the new millennium, causing HE enrollment to drop considerably in the mid-2000s.

Massification and private sector growth (1995-2005)

When Kazakhstan became independent in 1991, it was left with a centralized HE system that had serious limitations. It had traditionally operated under the conditions of a strictly planned economy, and Kazakh universities had never been a considerable driver of research and innovation.Moreover, Kazakhstan's HE had, for a long time, been 'peripheral' to Soviet education dominated by universities in Russia.

Despite that, the size of the university-age population was growing from mid-nineties to mid-2000s. This growth was, to a large extend, enabled by the creation and expansion of the private HE sector. The new Law on Education of 1992 introduced private universities and tuition payments, which, along with the market forces and demographic trends, led to the mushrooming of private sector HE from the 1990s until the mid-2000s.The number of private institutions grew by almost a hundred (from 32 in 1994 to 130 in 2004). Arguably, private institutions were the main driver for the massification of HE in the country. From 2000 to 2005, the number of students per 10,000 people increased from 257 to 496 students (Ministry of Education and Science RK, 2012).

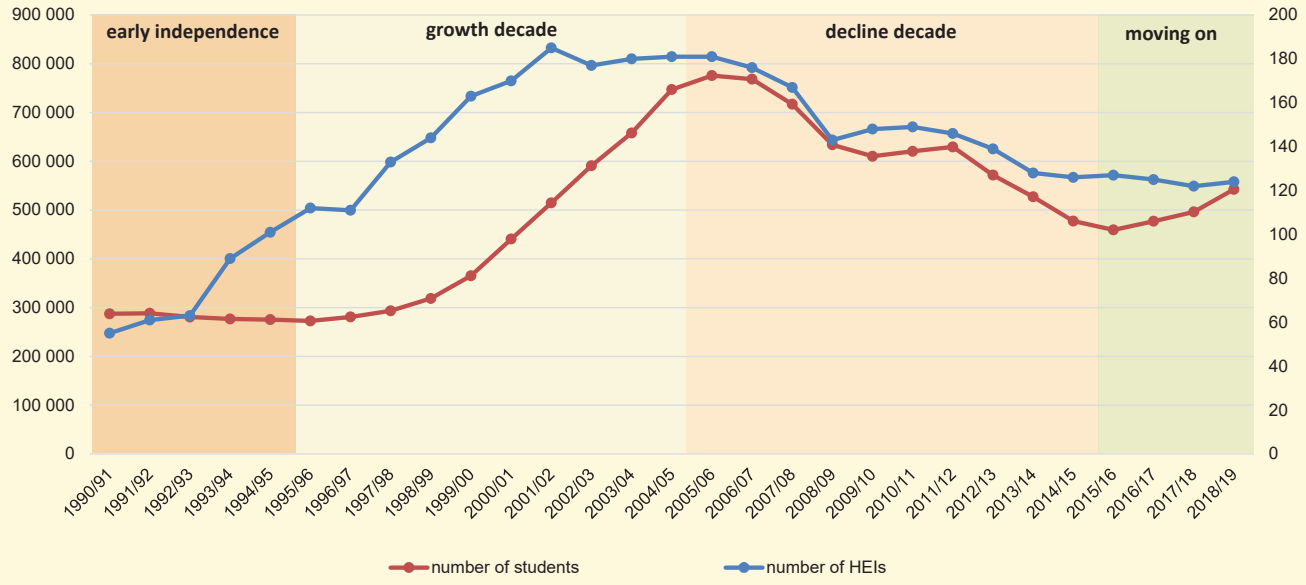
The massification of HE continued through the mid-2000s. From 1995 to 2005, HE enrollments increased from around 273,000 to 776,000 students, a 284% increase in just a decade. In the same decade, the number of institutions has increased by 69, from 112 to 181.

Enrollment decline and the 'optimization' (2006-2015)

As the massification continued, multiple concerns appeared about the diminishing quality of university education, particularly in the private sector. These concerns led to what policy makers referred to as the 'optimization' of the network of HEIs. In the course of this optimization, many private universities had their education licences revoked and closed. This approach was critiqued by some as rushed and one-sided. In some cases, the optimization led to university mergers, primarily between public institutions. As a result of this continuous shrinking of the HE network, from its peak in 2005, the number of HEIs in the country fell from 181 to 127 in 2015.

The decline in the number of institutions coinscided with a decrease in student enrollment. As such, enrollment had continuously fallen from around 776,000 in 2005 to 459,000 in 2015, a 40.8% decrease in just a decade. This significant decline was the result of plumetting birth rates in the mid-1990s to mid-2000s. Birth rates during that decade averaged 16 per 1,000 population; natural population growth averaged 5.79 per 1,000. Along with the lowest birth rates in the history of the country, infant mortality averaged 25.3 children per 1,000 population. Thus, the decade of enrollment decline was likely the result of a decade of demographic crisis.

Dynamics since independence: student enrollment and number of institutions



Moving forward (2016-2026)

Currently, there are 125 HEIs in Kazakhstan, 41 of them are public and 84are private, together enrolling 604,345 students (an 11.4% increase from last year). About 30% of students receive a full government scholarship. The numbers of scholarships are growing, including special need-based grants, while other conditions for students are improving (e.g., a 20% increase in student stipend across the board since January 1, 2020).

We can expect the growth in enrollment rates in the near and medium term. Birth rates are comparatively high (the average birth rate coefficient for 17 year-olds who will enter universities this year and for the next ten years is 20.8. This, along with the fact that the country's population is quite young (the average age is 31.7), suggests a steady influx of students to Kazakh universities.

However, there are also considerable challenges ahead. While the favourable demographics show a steady increase of the college-aged population, education attainment needs to increase considerably for the country to be competitive and realize its goals of becoming one of the thirty most developed nations in the world. Kazakhstan is far from this goal, according to the Global Comptetitiveness Index 2018, Kazakhstan is 61st in college attendance rates since only 46% of the college age population (18-22 year olds) enrolled in HE.

Another growing concern is youth emigration and the brain drain. In the first half of 2019, more than 20,000 citizens emigrated from Kazakhstan; most of these departed to Russia. The negative saldo has increased since 2011. Immigration to Russia among high school graduates and youth is not a new phenomenon. Russian universities have traditionally challenged Kazakh institutions in regions that share a border with Russia offering earlier admissions, free education, and a way to avoid Kazakhstan's national college entrance examination, the Unified National Test which is similar to Russian Unified State Exam.

To conclude, Kazakhstan has the potential to benefit from its favourable demographic situation, which will likely result in increased HE enrollment in the next decade. However, growing youth mobility and internationalization, coupled with increased educational opportunities in neighboring countries to the East and North, will challenge the ability of Kazakh universities and society to attract and retain local talent.

Demographic Trends and the Accessibility of Higher Education in Russia

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Fertility, mortality and migration are constantly changing the population dynamics in Russia. Various historical events (economic crises, the collapse of the USSR, etc.) had a huge impact on the age and sex pyramid of the population. The consequences of the demographic crisis also influenced the number of potential university enrollments. An analysis of demographic trends in the Russian higher education (HE) system made it possible to identify several patterns.

1) Overcoming demographic falls will lead to a sharp increase in the number of applicants

An increase in the cohort of young people will lead to an increase in the number of students. The dynamics of Russian population aged from 17 to 21 shows that, after 2019, the Russian HE system will be subject to an increase in the number of applicants. This is caused by overcoming the demographic fall of the 1990s. From this point of view, 2019 is a turning point in terms of the number of potential enrolments in Russian universities. By 2024, the size of the 17-21 age cohort is expected to increase by 15% and by 45% by 2034. It is expected that such dynamics will have an impact on the demand for HE and will increase competition among applicants. This causes particular concern as the number of universities has decreased significantly in recent years.

2) The unified state exam strengthened the educational migration of youth

The demographic situation is dynamic, but it usually develops gradually, however, demographic trends can be less predictable if caused by external factors – political action or technological development [1]. In particular, the introduction of the unified state exam (USE) in 2009 increased the horizontal mobility of youth [2]. As evidenced by official statistics and the results of opinion polls, in this regard, USE can be considered a mechanism for realizing the desires of young people to leave home at an earlier age. In particular, this is confirmed by the data of the Federal State Statistics Service, which show that changes in the place of residence started being made much earlier. While in the past, they were made at 20-24 years, now they are made at 15–19 years. Educational migration has led to the fact that the majority of Russian regions (75%) experienced an outflow of young people. As a result, most of the students are concentrated in the regions most attractive for studying and living – the Central Federal District, Moscow and St. Petersburg [3].

3) Growth in the number of applicants and increasing migration enhance territorial heterogeneity in the accessibility of higher education in the Russian regions

According to the Federal State Statistics Service (Rosstat), education remains one of the leading reasons for changing place of residence. All demographic processes, despite their apparent independence, are ultimately socially predetermined, and their intensity is caused by socio-economic conditions. Young people consider life and education in the capital or large cities to be the best and associate these with greater career opportunities [4]. This situation would not cause serious concern if it were not exacerbated by the fact that young people do not return to their native regions and settlements. As a result, only a third of Russian regions are characterized by growth in the number of youth. According to our studies, this trend will only intensify, since the predicted values of the age cohort of potential university entrants will differ in Russian regions. It is associated with the attractiveness of regional HE and with demand for applicants. The most attractive regions [5] (we estimate that there are 8 regions) will face an intensive influx of young people who will create competition with local school graduates; the infrastructure issue will become even more acute. On the other hand, an overwhelming majority of regions will be less attractive. They increasingly face the loss of human capital; therefore they will have to pursue an active policy to retain or attract youth.

4) The current policy of admission quotas forces unequal access to education for various age groups

The current policy of ensuring state guarantees in HE is aimed at the age group of 17-30 year-olds and provides for the allocation of funds from the federal budget for the education of 800 people per 10,000. The14 age groups that fall within the cohort of 17-30 years are demographically very heterogeneous.

Three Rosstat options for forecasting the population [6] indicate a reduction in the size of the 17-30 age group. Consequently, the realization of state guarantees related to this age group will lead to a reduction by 13% of state-funded places in universities in the next five years, that is, about 242,00 people will lose the opportunity to study free of charge. In the next five years there will be higher competition for admission to university, since most applicants are young people aged 17-21 years (the approximate average age of students admitted in 2017 is 18 years). This age group, on the contrary, will increase in absolute numbers, which may lead to a decrease in the availability of state-funded places in universities. 2019 was a turning point in terms of the number of potential applicants for Russian universities. At the end of the peak, the number of applicants will increase the demand of HE. Without an increase in admission quotes, the proportion of school graduates entering universities will decrease, posing risks of educational inequality and social tension.

The problem is even more acute in the regions [7]. In a number of cities and regions, this growth will be offset by the low demand for regional HE systems, and in the most attractive territories it will be aggravated by an influx of applicants from other regions. This could lead to differentiated access to HE for school graduates in "home" regions and to mounting pressure on HE systems in the capitals, in which the opportunities of graduates of local schools to study at universities will be reduced even further.

We see that education policy must take into account the demographic trends and migration intentions of youth

in such a large and heterogeneous country as the Russian Federation. We can assume that number of students aged from 17 to 21 will increase whereas the intensification of educational migration will increase the pressure on social infrastructure. The HE system can be considered one of the key elements of the government's demographic policy, including overcoming the centripetal migration of youth.

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Universities in the face of demographic changes: the case of National Research Tomsk State University

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The connection between education and demographics is deep and diverse. This article investigates the case of Tomsk State University (TSU) given the demographic changes in Russia and especially in Western Siberian. The influence of demographic factors on the priorities of educational policy, the activities of teachers, university positioning, and strategic enrollments are also monitored.

Tomsk State University in a context of demographic situation: a historical perspective

National Research Tomsk State University (TSU) was founded in 1880, during the development of Western Siberia and as a result of increased migration. TSU was at the center of the industrial development of the region. The growth of Siberian cities and the exploration and development of natural resources were the main drivers of the University's research, development and teaching. TSU became the foundation for the creation of scientific and educational centers throughout the region, including universities in Barnaul, Gorno-Altaisk, Omsk, Tyumen, as well as other higher educational institutions in Tomsk (TPU, SibGMU, TUSUR). The development of the university in the initial period coincided with the second demographic transition, societal and population development, a characteristic increase in urbanization, changes in life expectancy, and types of labor activity. These contributed to the growth of the educational needs of the population. The demographic transformation in the region included social and economic factors: revolution, war and large-scale economic projects for the development of Siberia in the Soviet period. By the beginning of the 1990s, the region was completely industrial with a substantial decrease in the birth rate. The demographic situation in the region was influenced by factors typical for the entire country: socio-economic crisis, the collapse of the USSR, and a large-scale reduction in the economy. Russian historical demography terms this period "the demographic pit".

Current substantial demographic factors for TSU

A number of factors influence the demographics of the university at the beginning of the 21st century. Firstly, migration, which began at the end of the 20th century, is intensifying. Migration flows are increasing in the direction south-north, east-west. The region is actively replenished with migrants from the territories of the former Soviet republics and regions of the Far East, while migration from Western Siberia to the central regions of Russia and abroad is also intensifying. The university is a participant in the migration process, which leads to an increase in the cost of human capital: migrants actively use the capabilities of a strong scientific and educational center.

The second factor was the strengthening of government demographic regulation: measures to stimulate birth-rates, reduce mortality, and increase life expectancy. The first results, which became noticeable for the university, showed that the population growth at the age of 17-25 is a consequence of the birth rate of the "stable" 2000s. There was a 3% growth in the number of enrollments from 2018 to 2019 (from 7,812 to 7,980), and the growth of student applications submitted increased from 20,309 to 20,897.

The third factor is the "deferred demand for education". This is associated with the technological renewal of production, an increase in life expectancy and an increase in the educational needs of the population. Currently, growth is around 10% and this is projected to increase.

The influence of demography on educational priorities, the activities of teachers, university positioning, and strategic enrollments

More than 59,000 people are being educated in the Tomsk Region; every eighth resident of Tomsk is a student. The region ranks third (after Moscow and St. Petersburg) in the number of students per capita. Students from 78 regions of Russia and from 79 countries study at Tomsk universities, the latter group are 22% of the full-time student body. There are 139 areas of study for Bachelors' and Masters' degrees. TSU and Tomsk Polytechnic University (TPU) are national research universities, and are also leaders of the 5-100 Project, aimed at improving the global competitiveness of Russian universities.

Students come to TSU from all over the Siberian Federal District, especially the Kemerovo Region, Novosibirsk Region, and Altai Territory. Traditionally significant are the flows of applicants from the near abroad: Kazakhstan, Uzbekistan, and Kyrgyzstan. Interest in Turkmenistan is growing. In general, TSU attracts the strongest applicants from these countries. Recruitment from non-CIS countries is growing, although these figures are still relatively small (about 25% of all foreign students). Currently, about 12 fully EMI programs are being implemented at TSU. The number of incoming foreigners increased from 390 in 2013 to 938 in 2019.

New priorities for educational policy are included in the work of teachers. First of all, difficulties arose with the quality of the training of foreign students. The university decided to integrate foreign students into the general student population, but the lower level of knowledge of foreign students was revealed, especially in humanitarian subjects. There was a need for general cultural training, including Russian language, social studies, and the history of Russia. Teachers felt the need for adapting educational content and using different teaching methods. The work of language teachers, who offered Russian language courses, was significantly intensified. The interest of teachers in learning English has grown. With active encouragement from the university administration, the number of EMI modules and courses has grown several times. A preparatory faculty was opened, where foreign students could receive training in Russian and English.

The recruitment of new enrollments has grown, as noted, by 3% over the last year alone, and this positive trend has been observed for several years. This is accompanied by an increase in state-funded places (in 2013 – 2,362 places, in 2019 – 3,128 places), and an increase in the quality of applicants: a significant increase in the average Russian Unified State Exam score (from 69 in 2013 to 81 in 2019 out of 100), an increase in the number of winners Olympiads (from 11 in 2013 to 148 in 2019), the number of "high achievers" (students who got a score of 100 out of 100 by Russian Unified State Exam) (from 820 in 2013 to 1,575 in 2019). The university purposefully supports the policy of selecting the best applicants, supports Olympiads and pays attention to "high achievers", providing them with support through the TSU tutorial service. Overall, the following trends in the recruitment of new applicants can be noted: an increase in quantity and quality of students; an orientation to neighboring countries; and an increase in foreign students.

Demography plays a role in the flow of educational migration and affected the university's positioning policy. In order to become more recognizable in the international community, Tomsk universities are trying to merge into a "Big University", a single conglomerate of Tomsk universities, using a common policy of recruitment and the promotion of educational services. Not only are individual universities positioning themselves, but so is Tomsk itself, as a university city, with a special environment, offering a high level of educational services. As experience has shown, high-scoring applicants choose not only a specialty and the university, but also an environment conducive to study. Raising the average entrance exam score did not decrease the influx of new applicants as expected, but actually increased it. As a result, the city is saturated with graduates and does not delay most of them but acts as a kind of hub for their further careers.

Economic factors are also important. There has been a decrease in purchasing power and the number of paying students has decreased since 2013 by about 10%. Applicants who are not able to pay often enter technical schools. A significant difficulty here is the university's lack of independence in regulating the cost of education.

In general, the influence of demographic factors on the priorities of educational policy is now less significant. Educational subjects are much more important: for example, in Tomsk, about 1,000 high school students pass the physics exam, while there are about 2,200 budget places. This imbalance requires a range of responses including attracting applicants from other regions, strengthening physics education in schools, strengthening the role of competitions. Another important factor is the availability of dormitories with the growth of the number of applicants. The state's regulation of educational policy also has a large effect: the number of places assigned to each subject area, establishing the lower minimum bounds for assessment, etc. Together,

these factors currently outweigh the demographic factors. Thus, while the creation of TSU in its historical context coincided with the industrialization of Siberia, at present, demographic factors such as migration flows from the countries of the former USSR, the birth rate increase of the 2000s, and the growing pent-up demand for education among the population are significant. Demographic factors affect the priorities of educational policy in varying degrees, as well as the activities of teachers, the positioning of the university in the international market, and its strategy for recruiting students.

The Impact of Demographic Trends on Higher Education in Armenia

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Higher Education (HE) in Armenia is facing the challenges of global changes and the resulting socio-economic issues, and to the demographic and transitional changes the country experienced after the independence in 1991.

The transition from a planned economy to market one opened new opportunities for HE and Armenia did not avoid the HE massification processes. This resulted in an increased student intake and the emergence of new private and intergovernmental universities, such as the Russian Armenian University. In 1997, the number of universities in Armenia was 103 (with a total of 57,388 students) compared to 24 in 1990 and 38 in 1991. The peak of student participation in Higher Education was 2011 with about 95,300 students, but the demographics worked against the universities and there was a 27% decline of the student population in Armenia by 2018.

Migration, low birth rates, and declining student participation

Declining student participation in HE was due to a range of demographic factors. The first cohorts of migration started in 1989 and continued up to 1995 with further decline by the 2000s as a result of the harsh socio-economic situation, resulting in about 900,000 people to leaving the country. According to the UN National Human Development Report of 2001 [1], the majority of emigrants were those with an educational level higher than the national average. Qualified specialists, especially in STEM fields left the country further affecting different socio-economic sectors, including HE. Even after the 2000s, migration declined but did not stop and annually 1% of school students left the country by 2017.

The migration of the reproductively active population and the war of 1991-1995 affected birth rates in Armenia as well, and the country faced the issue of an aging society. Currently, 18% of the population is over 60, meanwhile, according to different projections the population in Armenia will significantly decrease by 2050. This is not a purely Armenian phenomenon [2]; many countries across the world will face these problems and should consider innovative policies and public services to mitigate the risks.

Demographic shifts affected the HE intake, resulting in the number of universities declining (56 in 2019 compared to 68 in 2011 and 91 in 2001, meanwhile, the student population fell to 69,622 in 2018 compared to about 95,300 in 2011. The rapid decline in student numbers was conditioned not only by high migration rates but also by the reform of secondary education, which changed from 10-year schooling to 12-year.

The Impact of Demographics on the Quality of Education

The demographic issues concerned not only the student intake but also the quality of HE which stemmed from a range of factors, such as university's dependence on tuition fees, a low proportion of public funding (15-20%) in annual HE budgets, and the lack of alternative revenues and endowment funds. In this situation, universities had to revisit student recruitment and management systems which had two-way developments. Universities deployed modern marketing and recruitment mechanisms, but in the light of the low intake they had to accept students with poor performance, resulting in a 10% to 52% decline in the admission grade thresholds 2014-2019, even for specializations in high demand, such as law and international relations. Even though the low student intake impacted decisions on academic staff recruitment, the cuts in academic staff were not proportionate to the decline of student numbers, in order to mitigate the social boom and the number of academic staff declined by 6.5% compared to the 27% decline in the student population from 2011 to 2018 with 1/7 student-staff ratio compared to 1/10 in 2011. However, having more professors than required, since 1 full staff professor's position was split to several (0.25 or more) to keep academic staff, neither improved the academic quality nor fostered research. This imposed a heavy financial load on universities having 75-80% of the budget allocated for wages and this limited the possibilities of investing more in the quality of teaching and learning, or research.

Plans for dealing with demographic issues

How could universities survive in times of demographic shifts and an aging population? The most interesting point is that these demographic shifts and low in-country student intake did not greatly affect the recruitment of inter-

national students and the number of foreign students in proportion to the total student population in the first year at state universities had a 2% growth during 2011-2018, though the absolute numbers did not change significantly. Instead, the absolute numbers of foreign student population more than doubled at non-state universities as a result of their flexible policies and regulations for the admission of foreign students. Several obstacles, such as centralized regulatory policy with rigid instructions for the organization of study programs, centrally regulated international admissions, the lack of courses in foreign languages and of international dimensions in study programs hindered the organization of international recruitment at state universities. The new draft Law on Higher Education and Research of Armenia that has been recently circulated provides incentives to universities in the organization of their study programs and student recruitment. However, universities should think over internal reforms and put more efforts into the improvement of academic quality and resources.

Students have become more practical and are seeking learning experiences that would ensure their employment and career advancement, making the battle for student recruitment tougher. International mobility also affects the overall student intake in the country.

Facing such tough competition, universities should leverage technologies and consider not only better-quality traditional classroom experiences, but also e-learning possibilities. Short-term reorientation or fast-track courses for adult learners is another opportunity for universities to improve. The international dimension of academic programs and internationalization at home, wider partnerships with business and international organizations, work-based learning opportunities, and the deployment of new techniques in reaching students both locally and internationally would open up new opportunities for universities to alleviate the impact of negative demographics.

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Notes:

All calculations have been done based on the data retrieved from www.armstat.am

About HERB

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