

RESEARCH OF THE PROCESSES OF REDUCING THE NUMBER OF STUDENTS OF ONE SPECIALITY AT THE HIGHER TECHNICAL INSTITUTIONS IN UKRAINE

The analysis of change in the number of specialities in 17 higher technical institutions where 30 or fewer students were enrolled as first-year full-time students has been given in the paper. It has been revealed that between 2005 and 2014 there was a significant increase in these areas of training that required development and introduction of specific measures, aimed at cost reductions.

Keywords: higher educational institution, academic group, the number of students, diversification of specialists' training, small-scale training, first-year full-time students' distribution according to the areas of training

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ДОСЛІДЖЕННЯ ПРОЦЕСІВ СКОРОЧЕННЯ ЧИСЕЛЬНОСТІ СТУДЕНТІВ, ЩО НАВЧАЮТЬСЯ ЗА ОДНІЄЮ СПЕЦІАЛЬНОСТЮ У ВИЩИХ ТЕХНІЧНИХ НАВЧАЛЬНИХ ЗАКЛАДАХ УКРАЇНИ

У статті на прикладі 17 технічних вищих навчальних закладів здійснений аналіз зміни кількості напрямів підготовки, за якими на I курс за денною формою навчання зараховано 30 і менше студентів. Виявлено, що за період з 2005 по 2014 рік відбулося суттєве збільшення таких напрямів підготовки. В складних фінансових умовах це вимагає від вищих навчальних закладів розробки та впровадження спеціальних заходів, спрямованих на економію витрат, пов'язаних з навчальним процесом.

Ключові слова: вищий навчальний заклад, академічна група, кількість студентів, диверсифікація підготовки фахівців, дрібносерійна підготовка фахівців, розподіл студентів першого курсу денної форми навчання за напрямками підготовки.

Problem statement

Over the past several decades social, economic, demographic and political transformations in Ukraine have had a strong influence on higher education. First of all, the diversification of specialists' training has increased the number of areas of training and specialities at the higher educational institutions (HEI). The main reasons for diversification are as follows:

First, the need in mass training for giant enterprises has disappeared. Trying to maintain a state order, the number of students, an academic staff and the funding, the universities organized training for some new, non-core specialities.

Second, the chronic underfunding of the universities and opportunity to study at the expense of individuals and legal entities contributed to the opening of popular areas of training and specialities associated with the market economy development and the type of studies that might provide for a rapid career (economics, management, legal law).

Third, the regional enterprises only employ young professionals graduated from the local universities. This can be easily explained: when young people obtain a higher education at the big scientific and cultural centres of Ukraine, for instance in Kyiv, Kharkiv, Dnipro, Odesa or Lviv, they never return to their native towns. This allows the local universities to open the areas of training and specialities the graduates of which are demanded in small quantities.

One of the problems caused by diversification is small-scale training. As a result of the reduced number of students enrolled in one speciality there are some of them where only one academic group is formed. Yet lectures and classes are held with more academic groups which leads to significant increase in cost of education.

Over the past years there has been one more powerful factor besides diversification (which results in distribution of students over a larger number of specialities) – the reduction of the number of school leavers. According to statistical information in [1] one can state that the number of school leavers in 2015 is reduced by 43.6% compared to 1991 and by 56.5 % compared to 2004.

Thus the number of areas of training has increased, while the number of students has decreased. The gradual decrease in the number of students who can choose among the larger number of specialities may result in small-scale training, where only a small number of students study a particular speciality.

In our opinion, the processes of diversification are of particular importance for the technical universities, because over the past twenty-five years it is the industry which has undergone the greatest transformation in Ukraine. It has resulted in a significant reduction in the demand for university graduates and also less interest in engineering both by students and their parents. That is why, while investigating the distribution of small-scale training, the priority should be given to the technical universities.

Analysis of recent research, publications and unsolved parts of the given problem

This issue and the related problems are not given due attention in the literature. The only exception are [2; 3], but those studies took place 16 and 10 years ago, respectively. The most recent publication devoted to the subject was the abstract [4]. The analysis performed on the material of 16 technical universities allows one to conjecture that the number of specialities with only one academic group of students is gradually increasing.

Research objective is to test the hypothesis about the distribution of small-scale training at the technical universities of Ukraine.

The main results of the research

In [2] we gave the data about the distribution of first-year full-time students among the specialities and areas of training of 9 regional technical universities in 1999. The universities of scientific and cultural centres of Ukraine (Kyiv, Kharkiv, Odesa, Dnipro, Lviv) were not considered. Some technical universities then had only one academic group of the first-year students (in the given group – eight out of nine universities).

The more detailed research was conducted in 2005; it covered 54 technical universities in Ukraine (out of 61 then present) [3]. It was found that in 17 universities and in one branch the total share of specialities with only one academic group of first-year students exceeded 20 %. Within 5 universities at one speciality the number of students was less than 10 persons.

To confirm the hypothesis about the distribution of small-scale training in 2014 the analysis of the number of students enrolled into these 17 universities has been carried out using the data of the “Konkurs” information system of Ministry of Education and Science of Ukraine. The comparison of the distribution results of the number of first-year students according to the specialities in 2005 and 2014 is given in the table. There is a clearly seen general trend of a reduction of the total number of students at different specialities and an increase in the number of specialities where fewer students are enrolled.

Table 1

Distribution of the number of first-year students at the technical universities in Ukraine in 2005 and 2014

Higher Educational Institution	The number of specialities with the persons enrolled							
	Between 1 and 10		between 1 and 15		Between 1 and 30		More than 30	
	2005	2014	2005	2014	2005	2014	2005	2014
1. Vinnytsia National Technical University				3	8	16	21	9
2. National University “Lviv Polytechnics”	1	6	10	11	50	28	39	40
3. Odessa National Polytechnic University		33	5	36	25	48	22	17
4. Ukrainian Engineering Pedagogic Academy		11		19	3	21	10	2
5. National Technical University “Kharkiv Polytechnic Institute”		37		50	24	86	52	23
6. Kremenchuk Mykhailo Ostrohradskiy National University		4		7	6	21	20	1
7. Mukacheve State University		6		10	3	14	6	2
8. Dniprodzerzhynsk State Technical University		6	1	14	17	22	10	1
9. National Mining University		1		6	8	23	27	9
10. Poltava National Technical Yuriy Kondratyuk University		4		9	6	17	17	13
11. Lviv National Academy of Arts	1	11	1	3	1	16	3	1
12. Ternopil Ivan Puluj National Technical University	1	4	1	9	6	20	13	
13. Admiral Makarov National University of Shipbuilding		1		14	10	29	19	1
14. Zaporizhia National Technical University		18		26	9	42	24	12
15. Ukrainian Academy of Printing		4			3	7	10	4
16. Kharkiv National University of Radio Electronics		9		12	6	24	22	8
17. Cherkasy State Technological University	1	8	1	12	11	28	13	4

To illustrate the processes of reducing the number of the students enrolled in the given higher educational institutions the change in proportion of the specialities with only one (Fig. 1) or several academic groups (Fig. 2) is shown. In this and subsequent figures institutions are marked according to their numbers in the table.

As it is seen in Fig. 1 only 3 universities in 2005 had higher than 50% proportion of areas of training where 30 or fewer students were enrolled. In 2014 the proportion of areas of training with fewer than 30 students exceeded 50% in all the above mentioned universities. Thus, in 8 universities it exceeded 80% and in Ternopil Ivan Puluj National Technical University there was not a single area of training with more than 30 students enrolled.

Fig. 2 shows that in 2005 14 out of 17 given universities more than a half of areas of training had a few academic groups (with more than 30 students enrolled). In 2014 only the National University “Lviv Polytechnic” had such a result, where in contrast to all the other universities considered, the share of areas of training with more than 30 students increased. In 10 universities the share of areas of training with a few academic groups does not exceed 25% of the total.

It is noteworthy that more and more small groups (with fewer than 16 students) appear among specialities with only one academic group (Fig. 3). The share of these groups in 2005 didn’t exceed 25% in every university and in 10 universities was less than 10%. In 2014, for only 5 Universities was that share over 50% and for 14 universities it was over 30%.

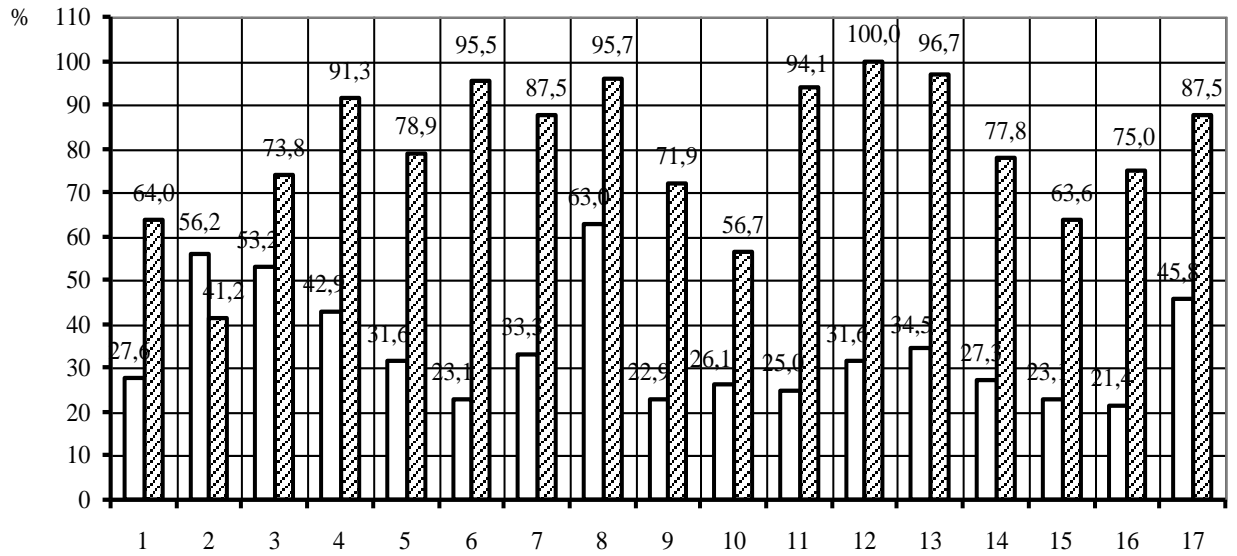


Fig. 1. Share of the areas of training with only one academic group (no more than 30 first-year students enrolled) in 2005 and 2014

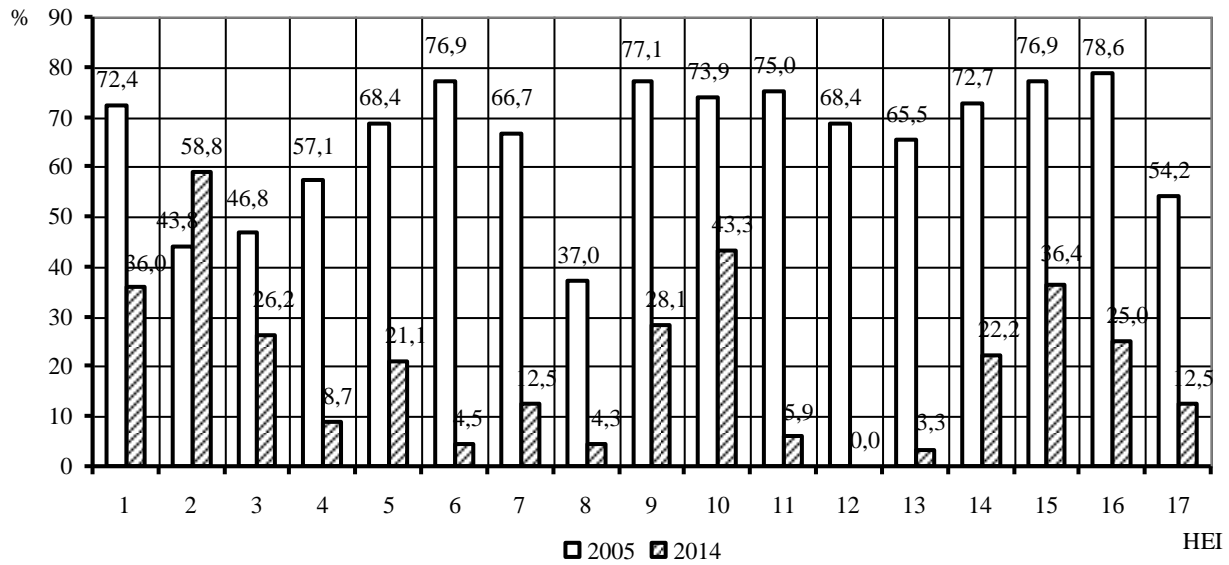


Fig. 2. Share of areas of training with more than 30 first-year students enrolled (a few academic groups formed) in 2005 and 2014

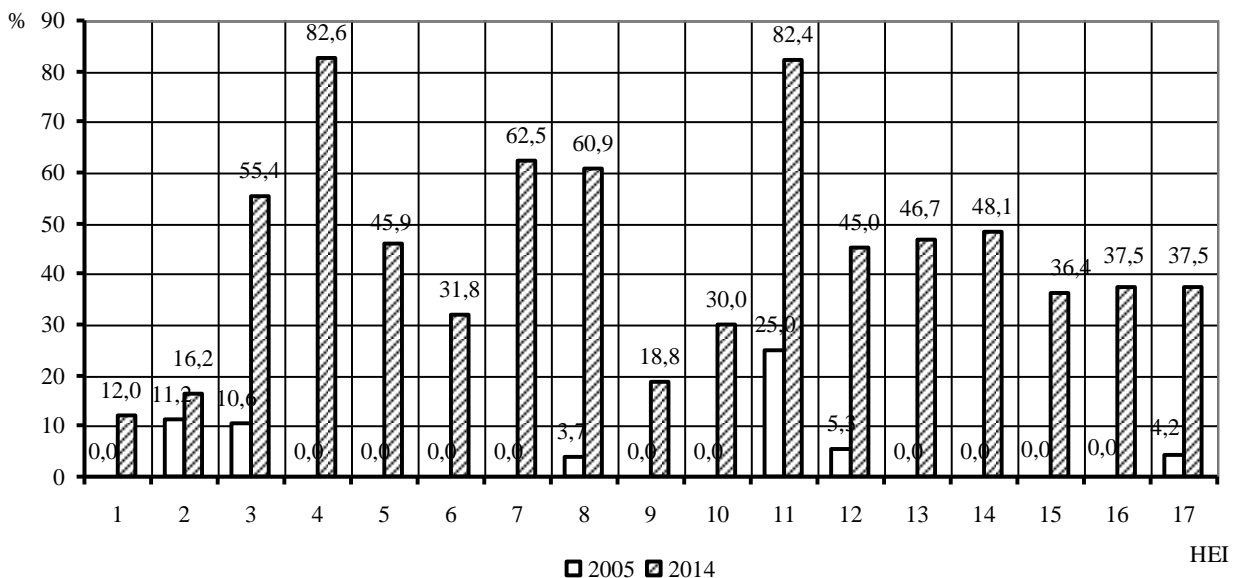


Fig. 3. The share of areas of training with fewer than 15 first-year students enrolled in 2005 and 2014

The proportion of the academic groups of 10 and fewer students increased significantly. There were such groups in 3 universities (out of the 17 considered) in 2005 and in 2014 they appeared in 16 universities (except for Vinnytsya National Technical University). For two universities the proportion of the groups with fewer than 10 students is more than 50% and for 7 universities it is over 30% (Fig. 4).

Certain problems occur during the process of setting up the small academic groups. The number of staff positions is determined by the number of students per one staff position and the number of students is insufficient to employ the staff (see more in [5; 6]).

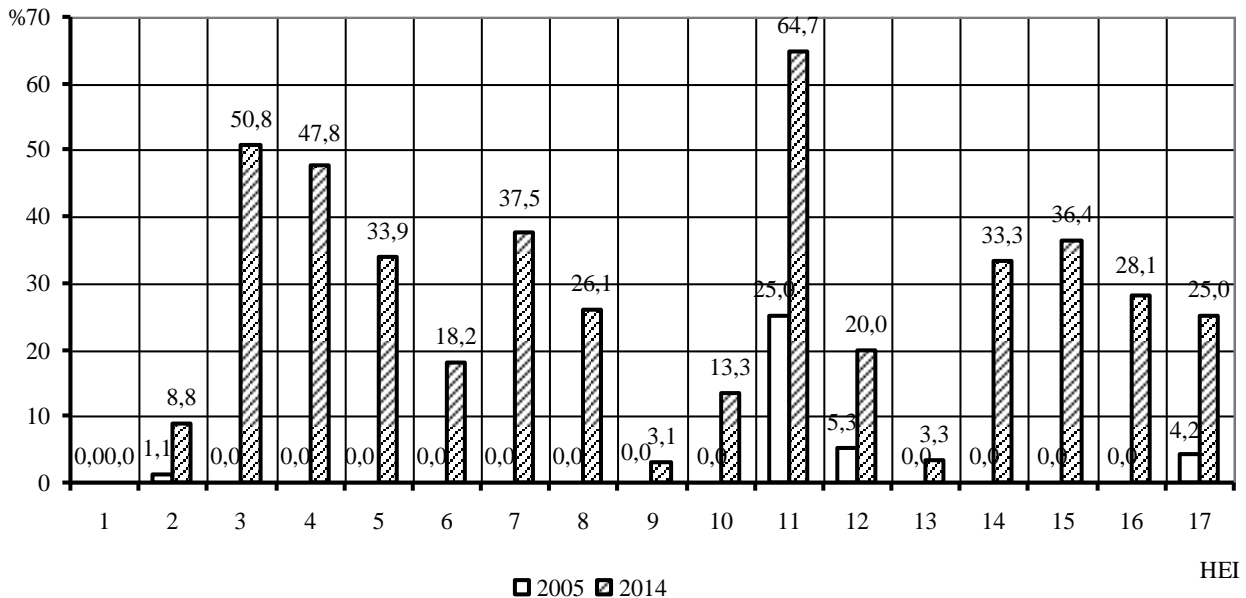


Fig. 4. The share of areas of training with fewer than 10 first-year students enrolled in 2005 and 2014

To supply the educational process with the lecturers and pay them for their work the number of students of the given speciality is of great importance (for more details see [5; 7, p.544–556]). The smaller the number of students the more shortages of the staff positions, and it has to be covered at the expense of other areas of training and specialities. This situation became especially difficult, as the maximum academic workload per one staff position has been reduced to 600 academic hours a year.

The increased number of the areas of training and specialities for small-scale training of specialists requires –ceteris paribus – some additional funding for the universities. However, one cannot expect improving in funding the sphere of higher education in the coming years. Therefore, to solve the financial problems they should be transferred into the lower level of management – a university one [8, p.112].

In this regard the problem of development and implementation of measures to save resources, which has been vital for universities for many years, is complicated by the effect of one more factor. In our opinion, the solution of this problem requires more attention to the economic aspects of the university activities. This primarily applies to the educational process at which one must take into account the need to achieve acceptable size of expenses. It is clear that the high quality of training need to be ensured.

In our opinion, to solve this problem one must organize the expenditure management system at university. Taking into account the big share of labour costs and the fact that these expenses are variable, this matter requires some special attention. This expenditure management system should be based on the subsystem of a salary management.

The expenditure management system must be carried out primarily by regulating the labour intensity of educational activities on the basis of its function. This function describes the relationship between the number of students enrolled in a particular area of training or speciality and the labour intensity of the educational activities that should be done to train these students (for more details see [9]). A direct impact on the educational activities can be achieved by various methods, but the most appropriate and effective one is the unification of curricula and educational training programs [10].

On the basis of the subsystem of salary management a powerful information database can be created to make scientifically based decisions as for organization of the educational process and its staffing considering the financial situation of the HEI.

Summary. Our study of 17 universities confirmed the hypothesis about the distribution of small-scale training in the technical higher educational institutions of Ukraine caused by diversification and the complex demographic situation. To get a better idea of the scope of this phenomenon, additional studies are required covering the largest possible number of the technical universities. It is advisable to carry out research concerning other groups of universities as well.

Due to the fast decreasing number of students and intensification of this process there is a new goal for the universities – to develop and implement some special measures allowing to manage expenditures for education.

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