

POPULARITY OF STUDY PROGRAMMES IN TRANSPORT MANAGEMENT AMONG THE APPLICANTS TO LITHUANIAN HIGHER SCHOOLS, PARTICIPATING IN JOINT ADMISSION PROGRAMME

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The operation of industrial, construction and agricultural enterprises as well as work efficiency and public opinion largely depend on reliability and effective performance of transport system. Lithuanian universities train qualified specialists in transport management, who are highly appraised in the European Union and other countries. Two higher schools in Lithuania (Vilnius Gediminas Technical University and General Jonas Žemaitis Military Academy of Lithuania) offer study programmes in transport management, leading to Bachelor's degree in Management and Business Administration. The present paper briefly describes a system of joint admission to Lithuanian higher schools which has been already used for several years in Lithuania. The problems of selecting applicants to Lithuanian universities and the level of knowledge of the applicants admitted to study the programmes in transport management will also be discussed.

Keywords: *Lithuanian universities, applicants, joint admission, transport management, study programme, popularity*

1. The Role of Transport in the Economic Development of the Country

Transport is a branch of production of material values associated with transportation of people and goods. In the system of production, transport refers to provision of services. Transport as an integral part of a larger system, i.e. a logistic chain, should be considered from various perspectives. In the context of determining the effectiveness of transportation by various means of transport, it is interesting to investigate freight transportation from the departure to the destination point. However, from the perspective of transportation organization, the whole process of transportation – from freight sender to freight receiver – should be analysed. When the interests of the customers are taken into account, other processes, including not only transportation by the major means of transport, but processing, storage, packing and unpacking, as well as feeding the materials to machine-tools in the shop and information processes related with the flow of materials, should be considered. This approach helps us to make an optimal choice of transport services because, usually, the quality of transportation is more closely connected with overall expenses than its cost [1–3].

From the perspective of specialization and cooperation of production, the study of transport should not be restricted to the area of some particular material and technical links. Therefore, transport should be considered in the system of logistics, including transportation from the primary supplier to the final user and all intermediate stages.

Logistics is a science dealing with planning, management, control and regulation of material and information flows in space and time in their movement from the primary source to the final user.

Logistics, though having deep roots in the past, is still a relatively new science. It flourished in the years of World War II, when it helped to solve the strategic problems, providing effective interaction between the defence industry and supply bases and transport for timely supply of the army with arms, ammunition, combustible materials, lubricants and rations. Later, the concepts and methods of logistics were gradually transferred from military to civil life. First, it was perceived as a new scientific approach to achieving the effective control of the flows of materials in the area of circulation, and, then, in the sphere of production.

Logistic departments have been established at industrial and agricultural enterprises, in transport system, NATO organizations, etc. They are even included in the organizing committees of some large international competitions.

At the end of the 20-th century, logistics was seen as a complex discipline including purchasing or supplying logistics, logistics of manufacturing processes, sale (market) or distributing logistics, transport logistics, information or computer logistics, etc.

A great deal of logistics operations performed with the flows of materials in their movement from the primary sources to the final users are based on the use of various means of transport. The costs of these operations make up to 50 % of the overall costs of logistics.

The subject matter of transport logistics is a number of problems associated with organizing freight transportation by commonly used means of transport.

The main problems of transport logistics include:

- the choice of a particular means of transport;
- the choice of the type (category) of transport;
- simultaneous planning of transportation, storage and production;
- simultaneous planning of transportation (by various means of transport) for multimodal transportation;
- ensuring technological unity of the processes of transportation and storage;
- determining rational delivery routes.

To solve the above problems, the country (not only Lithuania) needs highly qualified specialists in the area of *Transport Management*.

2. Training Specialists in *Transport Management* at Lithuanian Higher Schools

Specialists in the area of transport logistics (study programmes in *Transport Management*) are trained at two higher schools of Lithuania – Vilnius Gediminas Technical University [4] and General Jonas Žemaitis Military Academy of Lithuania [5] (see Table 1).

Specialists in *Transport Management* with Bachelor’s, Master’s and Doctor’s degrees are trained at Vilnius Gediminas Technical University [4].

At General Jonas Žemaitis Military Academy of Lithuania, only Bachelors of Transport Management are trained [5]. The graduates are awarded not only the Bachelor’s degree, but a military rank Platoon Commander as well. For getting the Master’s and Doctor’s degrees, the graduates should choose another study programme or higher school (university) of Lithuania.

The popularity of the programmes leading to the first (Bachelor’s) degree in *Transport Management* (qualification – *Bachelor of Management and Business Administration*) in two Lithuanian universities is considered below (see Table 2).

Table 1. Study programmes available at higher schools (universities) of Lithuania in the area of *Transport Management*

Bachelor’s study programmes	Master’s study programmes	Doctor’s study programmes
Vilnius Gediminas Technical University		
Transport Engineering Economics and Management (<i>Transport Economics</i>) Qualification – <i>Bachelor of Management and Business Administration</i>	Transport Engineering Economics and Management (<i>International Carriage Organisation and Management</i>) Qualification – <i>Master of Management and Business Administration</i>	Social Science (<i>Management and Business Administration</i>) Qualification – <i>Doctor of Social Science</i>
Transport Engineering Economics and Management (<i>Transport Logistics</i>) Qualification – <i>Bachelor of Management and Business Administration</i>	Transport Engineering Economics and Management (<i>Transport Logistics</i>) Qualification – <i>Master of Management and Business Administration</i>	Technological Science (<i>Transport Engineering</i>) Qualification – <i>Doctor of Technological Science</i>
	Transport Engineering (<i>Transport Engineering Management</i>) Qualification – <i>Master of Transport Engineering</i>	
General Jonas Žemaitis Military Academy of Lithuania		
Platoon Commander training Transport Engineering Management Qualification – <i>Bachelor of Management and Business Administration</i>		

Table 2. Bachelor’s study programmes in *Transport Management* of Lithuanian higher schools (qualification – *Bachelor of Management and Business Administration*)

Bachelor’s study programme	Study programme objectives and competencies acquired	Professional status, access to further study
Vilnius Gediminas Technical University		
Transport Engineering Economics and Management Qualification – <i>Bachelor of Management and Business Administration</i>	Specialists in Transport Engineering Economics and Management can perform various managerial functions in creating and developing business, organizing the work of the staff at transport enterprises and their departments, designing and implementing projects and making plans for developing and providing transport services, as well as compiling and arranging documents for developing business, maintaining business relations and initiating and implementing innovations in transport, giving the priority to management and administration of international transport.	Graduates can work at different departments of transport enterprises solving various economic and management problems. Graduates can continue studies in the fields of economics, management and administration.

General Jonas Žemaitis Military Academy of Lithuania		
Platoon Commander training Transport Engineering Management Qualification – <i>Bachelor of Management and Business Administration</i>	To train medium link transport engineering management specialists having sufficient knowledge, capabilities and skills to solve management problems. Upon graduation from the Academy, they must have mastered the fundamentals of transport economics, marketing, management, transportation technologies, finance and enterprise management and should be able to plan, organize and effectively use the transport of enterprises and institutions in accordance with the laws in force.	Graduates can work in subunits of the National Defense System as managers or in similar positions at various enterprises, institutions and organizations. Graduates can take Master-degree studies in management or choose the directions of studies close to it.

3. Lithuanian Higher Education System and Joint Applicants' Admission to Lithuanian Higher Schools

In 1989, a discussion about the introduction of two-stage education, involving Bachelor's and Master's degree studies, was organized. In 1991, the law was adopted on science and education in the Republic of Lithuania, legitimating the reform made in this area. Since then, this system has been considerably improved, and the 3rd stage of Doctoral studies was introduced [2, 6, 7]. Besides Bachelor's and Master's studies, there is a system of two-stage professional training aimed at more practical aspects of education. The scheme of Lithuanian higher education system is presented in Figure 1.

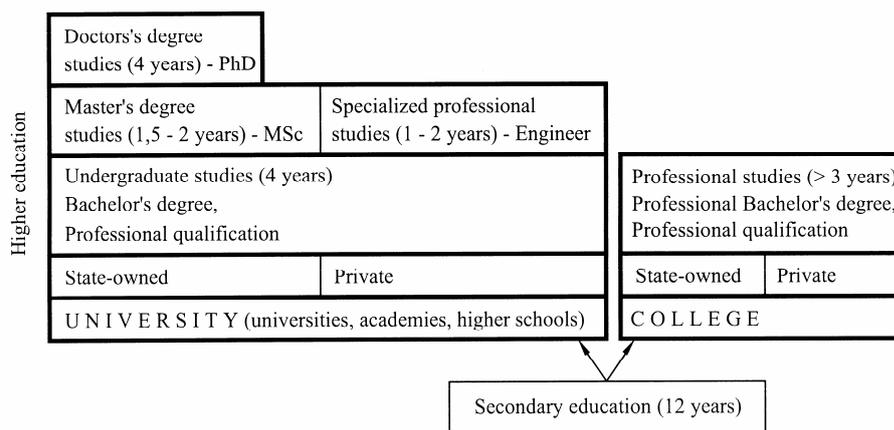


Figure 1. Scheme of Lithuanian higher education system

The above higher schools formed an Association of Lithuanian higher schools to implement the programme of joint admission helping the applicants to enter a higher school and to reduce the risk of a single possible choice, as well as making the selection of potential students more objective and simplifying the entrance by allowing them to apply to several higher schools simultaneously [2, 3, 6–8]. Based on this programme, an applicant is given an opportunity to choose a higher school and a study programme according to his/her order of preference and depending on the marks obtained in a secondary school. An applicant submits an application to any of the higher schools of the Association allowing him/her to select a number of study programmes in several higher schools.

Seventeen university-level higher schools and two non-university-level higher schools formed the Association (sixteen higher schools are state-owned and three higher schools are private).

In 2008, the Lithuanian higher schools participating in joint applicants' admission programme offered the applicants 732 study programmes: full-time (daytime) studies, part-time (evening) studies, part-time (extra-mural) studies in 62 study fields, which make 6 study area groups: technological sciences, social sciences, physical sciences, biomedicine sciences, humanities and fine arts [8, 9].

A chart of joint applicants' admission to Lithuanian higher schools is presented in other papers [2, 3, 6, 7].

Its main parts are as follows:

- starting joint applicants' admission (April 15, 2008) – accepting applications to Lithuanian higher schools from applicants (via Internet and personally);

- carrying on entrance examinations;
- correcting the study programmes indicated in the application (if requested by an applicant);
- accepting and considering applicants’ appeals for correcting errors in evaluating examinations;
- registering the documents;
- announcing the competitive marks of applicants;
- accepting and considering applicants’ appeals for correcting errors in calculating competitive marks;
- announcing the lists of applicants admitted to higher schools for all available study programmes;
- officially registering the admission of applicants to particular higher schools;
- completing of joint applicants’ admission (August 1, 2008) – announcing the information about vacancies left.

An applicant, participating in the joint admission programme, can mention up to twenty study programmes (choices) in the application to study at any Lithuanian higher schools. Study programmes are arranged in the order of preferences in the application. The name of the higher school, form of studies and financing are indicated for every study programme. The applicant is admitted to a higher school to study one of the study programmes included in his/her application, which is determined by computer after calculating his/her competitive mark. When the first study programme from the list of applicant’s preferences is found, for which the calculated competitive mark satisfies the requirements of admission, all other study programmes given below in the list are not considered (though the mark is sufficient for an applicant to be admitted to study them).

Competitive marks [2, 4, 5, 9] of the applicants to study according to the programmes in *Transport Management* at various Lithuanian higher schools are presented in Table 3.

Table 3. Competitive marks (without any additional points) of applicants to study according to the programmes in *Transport Management* at Lithuanian higher schools

Examination mark at secondary school	Weighted coefficient	A yearly mark in school-leaving certificate at secondary school	Weighted coefficient	The highest competitive mark (without any additional points) available at higher school
Vilnius Gediminas Technical University				
Transport Engineering Economics and Management – <i>Bachelor of Management and Business Administration</i>				
mathematics	0,50	history	0,15	21,35
the Lithuanian language	0,20			
a foreign language	0,15			
General Jonas Žemaitis Military Academy of Lithuania				
Transport Engineering Management – <i>Bachelor of Management and Business Administration</i>				
mathematics	0,45	mathematics	0,04	21,35
a foreign language	0,25	a foreign language	0,04	
the Lithuanian language	0,15	the Lithuanian language	0,04	
professional aptitude test	0,00	history	0,03	

4. Popularity of Study Programmes with the Applicants, Participating in Joint Admission to Lithuanian Higher Schools

The present publication was being prepared for RelStat’08 International Conference before the joint admission campaign for 2008 was over. Therefore, the data for this year are not provided.

The number of the study area groups of science in school-leavers’ applications in 2007 are presented in Figure 2 (the number of applicants to all six study area groups is assumed to be equal to 100 %). As mentioned above, there are 6 study area groups in Lithuania: *Technological Sciences*, *Social Sciences*, *Physical Sciences*, *Biomedicine Sciences*, *Humanities* and *Fine Arts*.

The average number of study programmes in school-leavers’ application is presented in Figure 3. The average number of study programmes chosen by school-leavers has been constant for some years and makes about 10 points.

Popularity of study programmes according to the study area groups in 2007 is given in Figure 4. For many years, *Social Sciences* have remained a popular area of education. Unfortunately, “more difficult” *Technological*, *Physical* and *Biomedicine Sciences* are not very popular with school-leavers, though the graduates have guaranteed employment and a high salary.

The popularity of study area groups reflected in school-leavers’ applications (based on choice No 1) and the state-fixed quotas in higher schools in particular study area group in 2003–2007 are presented in Figure 5. Study programmes in *Transport Management* refer to the study area group of *Social Sciences*. Study programmes in *Social Sciences* are approximately twice as popular as study programmes in *Technological Sciences*. Nowadays, *Social* and *Technological Sciences* are the most popular study programmes (see Figure 4 and Figure 5). In the last five years, the popularity of *Social Sciences* among applicants has been decreasing. In contrast, the popularity of *Technological Sciences* has been increasing.

The most popular study programmes in all study area groups in 2007 are presented in Table 4 based on the overall number of applicants' choices.

As shown in Table 4, four study programmes of *Transport Management* are not among the twenty most popular study programmes, but it does not mean that they are quite unpopular with the applicants.

The popularity of study programmes in *Transport Management* in school-leavers' applications (competition based on choice No 1 and all choices) in 2003–2007 is shown in Figure 6. The comparison of popularity of two study programmes in the area of *Transport Management* reveals that the most popular programme (according to competition or the number of applicants per vacancy) is *Transport Engineering Economics and Management* at Vilnius Gediminas Technical University, while the less popular programme in *Transport Engineering Management* is found at General Jonas Žemaitis Military Academy of Lithuania.

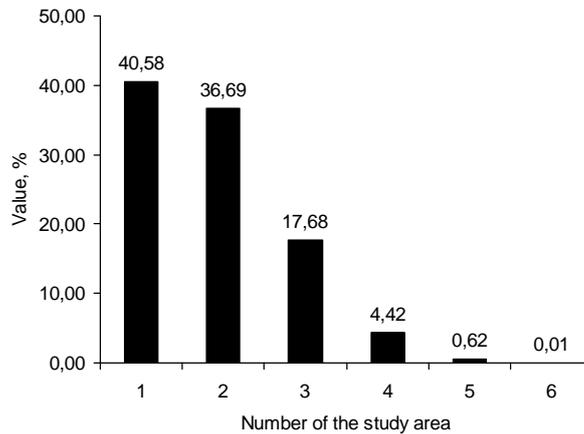


Figure 2. The number of the study area groups of science in school-leavers' applications in 2007

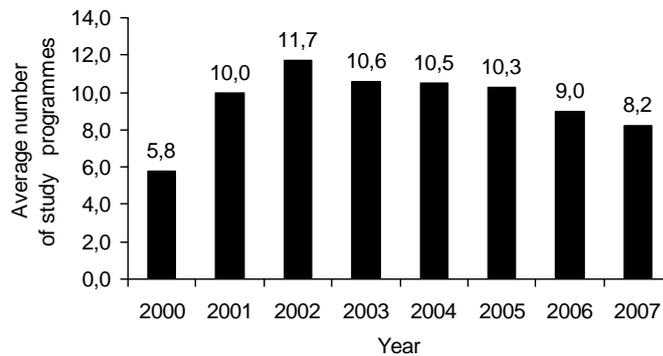


Figure 3. The average number of study programmes in school-leavers' applications in 2000–2007

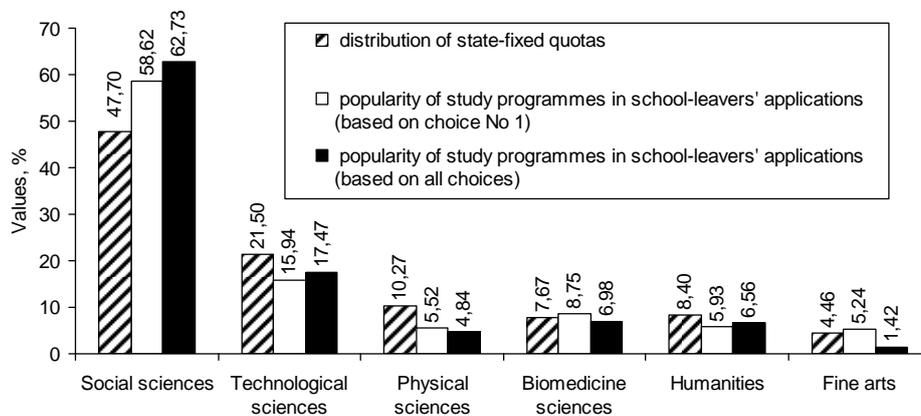


Figure 4. Popularity of study programmes according to the study area groups in 2007

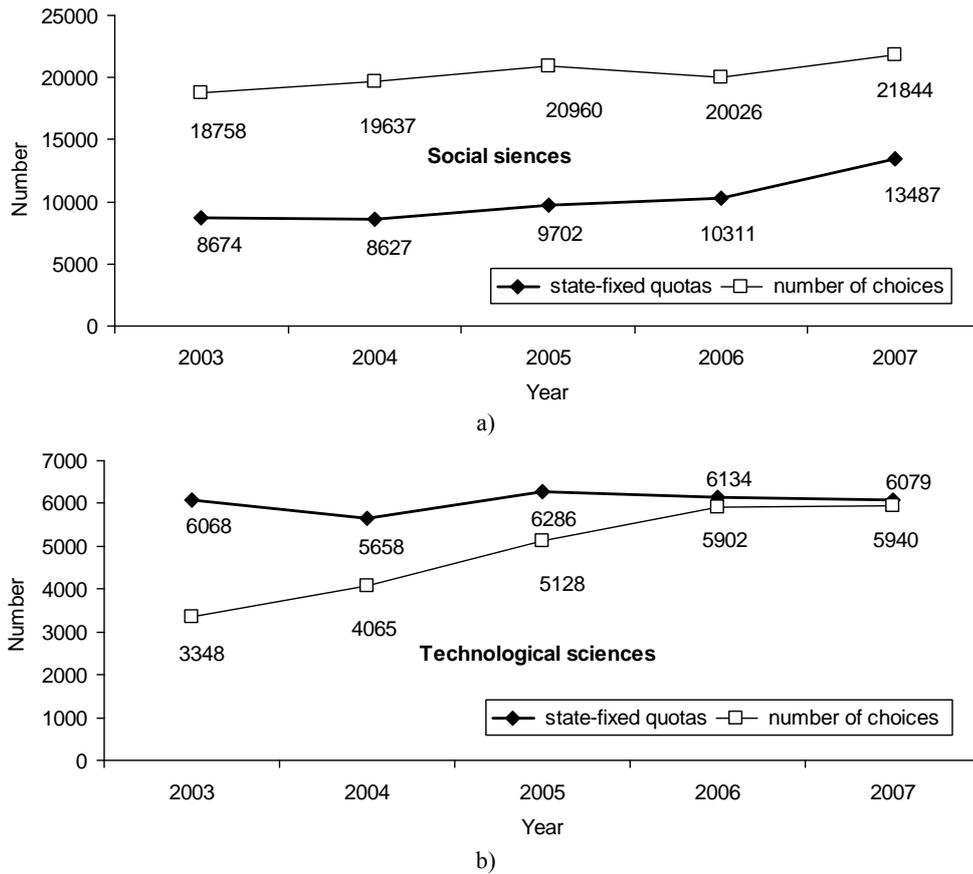


Figure 5. The popularity of study area groups reflected in school-leavers’ applications (based on choice No 1) and the state-fixed quotas at higher schools in particular study area groups in 2003–2007: a – Social Sciences; b – Technological Sciences

Table 4. Most popular study programmes in all study area groups in 2007

No	Higher school	Study programme
1	MRU	Public Administration
2	VK	Tourism and Hotel Administration (<i>non-university-level study programme</i>)
3	VG TU	Business Management
4.	VU	Management and Business Administration
5	VG TU	Real Estate Management
6	VG TU	Office Management
7	VK	Advertising Management (<i>non-university-level study programme</i>)
8	VK	Business Management (<i>non-university-level study programme</i>)
9	MRU	Law and management
10	MRU	Financial Economics
11	VK	Banking (<i>non-university-level study programme</i>)
12	MRU	Law
13	VU	Economics
14	VU	Business Information Management
15	VG TU	Construction Engineering (<i>Civil Engineering</i>)
16	VK	Office and Enterprise Management (<i>non-university-level study programme</i>)
17	KTU	Business Administration
18	VU	Law
19	VK	Insurance Management (<i>non-university-level study programme</i>)
20	KTU	Management

VG TU – Vilnius Gediminas Technical University; KTU – Kaunas University of Technology; MRU – Mykolas Romeris University; VU – Vilnius University; VK – Vilnius College of Higher Education (*non-university level*)

This may be accounted for by the fact that the study programme at Vilnius Gediminas Technical University is intended for civilians (in particular, specialists in transport economics and transport logistics are trained), while the study programme of General Jonas Žemaitis Military Academy of Lithuania is specific (being

intended for training not only specialists in transport economics and transport logistics, but military specialists – Platoon Commanders as well). The applicants to the Academy are required to be in good physical form and professionally fit, while school-leavers, usually, do not like it.

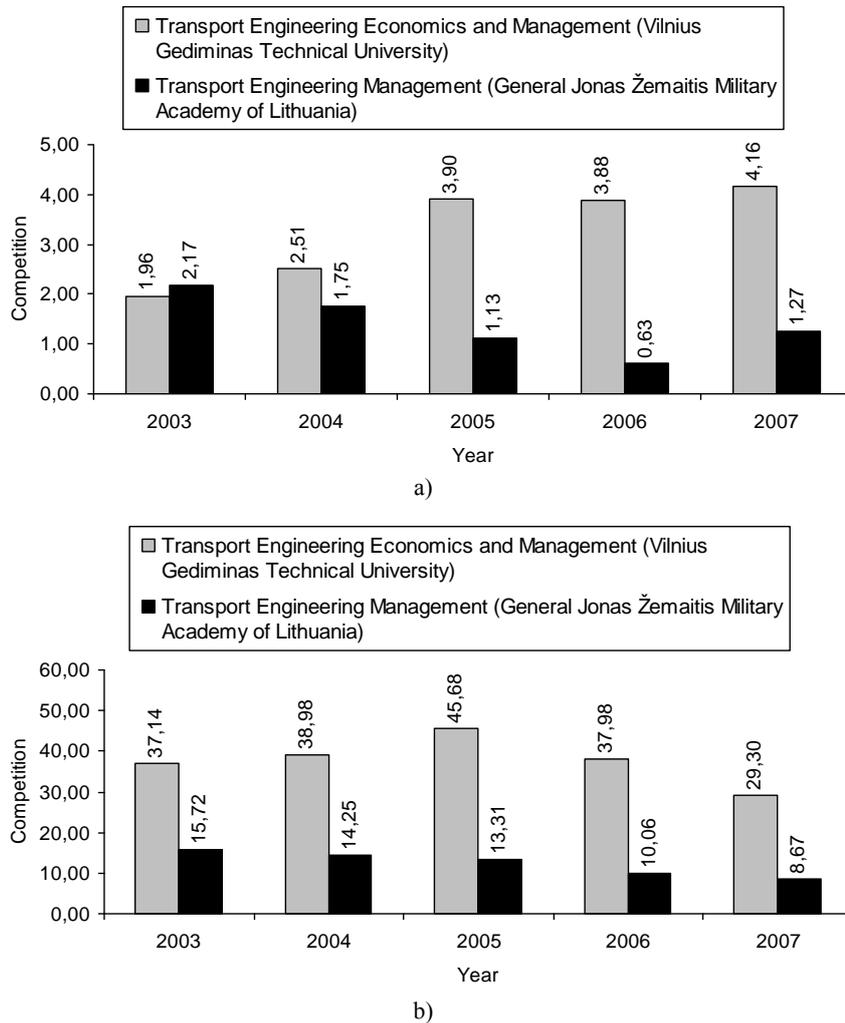


Figure 6. Popularity of study programmes in Transport Management in 2003–2007:
 a – competition based on choice No 1; b – competition based on all choices

The *competitiveness index* [2, 3, 7] shows the preparation for studies and intellectual potential of the admitted to a particular study programme. It is calculated as the average mark of the key subjects in the school-leaving certificates of all admitted to study this programme.

The competitiveness index of the admitted to study a particular study programme is calculated in the following way:

$$I_c = \frac{\sum_{i=1}^m \left(\frac{LL + M + P + FL + H}{5} \right)_i}{m},$$

where I_c is a competitiveness index of the admitted to a particular study programme; m is the number of the admitted to the study programme; LL is a mark for the Lithuanian language in school-leaving certificate; M is a mark for mathematics in school-leaving certificate; P is a mark for physics in school-leaving certificate; FL is a mark for a foreign language; H is a mark for history in school-leaving certificate.

To calculate I_c , a mark obtained at the secondary school-leaving state examination [2, 4–6, 8] is considered. If this exam was not taken, the mark obtained at school-leaving examination is considered.

The competitiveness index shows the competitiveness of an applicant to study any programmes at a higher school (compared to other applicants). The higher the competitiveness index of a study programme, the higher the general level of education of a person admitted to study a particular programme.

The highest possible competitiveness index for the best applicant is equal to $I_c = 23$.

Competitiveness indices of full-time studies in *Transport Management* study programmes are given in Table 5. As shown, more qualified applicants were admitted to the study *Transport Engineering Economics and Management* programme in Vilnius Gediminas Technical University.

The preparation level of the admitted to study according to a particular programme may be determined based on the average competitive marks of all the admitted, particularly, taking into account that the competitive mark (21,35) is the same for the above two study programmes (*Transport Engineering Economics and Management* and *Transport Engineering Management*). Average competitive marks for full-time studies in *Transport Management* study programmes are given in Table 5. As shown, more qualified applicants were admitted to study *Transport Engineering Economics and Management* programme in Vilnius Gediminas Technical University.

Table 5. Competitiveness indices, motivation indices and average competitive marks for full-time studies in *Transport Management* study programmes in 2007

Study programme	Competitiveness index	Motivation index	Average competitive mark
Vilnius Gediminas Technical University			
<i>Transport Engineering Economics and Management</i>	16,39	2,09	19,14
General Jonas Žemaitis Military Academy of Lithuania			
<i>Transport Engineering Management</i>	13,28	1,40	16,07

Training of a qualified specialist depends not only on the number of qualified university teachers, well-equipped laboratories and training centres, but also on the thirst for knowledge and eagerness of an applicant to become a qualified specialist in the selected field, i.e. his/her motivation. Motivation is reflected by the order of preference given by an applicant to a particular study programme in the application to a higher school.

The *motivation index* [2, 3, 7] is calculated by the formula:

$$I_m = \frac{\sum_{i=1}^m O_i}{m},$$

where I_m is a motivation index of a particular study programme; O_i is the order of preference (No) given by the i -th applicant to a particular study programme; m is the number of applicants admitted to a particular study programme.

The lower the index value, the higher the motivation of applicants taking a particular study programme. The ideal motivation index is $I_m = 1$, when all school-leavers admitted to a particular study programme mention it in the application as choice No 1.

Motivation indices of full-time studies in *Transport Management* study programmes are given in Table 5. As shown, more highly motivated applicants (eager to make a career in National Defence) were admitted to study *Transport Engineering Management* programme in the General Jonas Žemaitis Military Academy of Lithuania.

Conclusions

1. In Lithuania, there are six study area groups: *Technological Sciences*, *Social Sciences*, *Physical Sciences*, *Biomedicine Sciences*, *Humanities* and *Fine Arts*. Most of the applicants to higher schools of Lithuania indicate the study programmes of one or two of study area groups. The average number of study programmes in school-leaver's application is about 10 points.
2. The study programmes referring to *Social Sciences* (including the programmes in *Transport Management*) are more popular among the applicants to higher schools than the study programmes referring to *Technological Sciences*.
3. Nowadays, study programmes in *Transport Management* are available at two higher schools in Lithuania – Vilnius Gediminas Technical University and the General Jonas Žemaitis Military Academy of Lithuania.
4. The educational level of the applicants and those admitted to take various study programmes can be defined by their competitive marks and competitiveness indices.
5. The competitiveness index shows the level of preparation for studies and intellectual potential of the applicant admitted to a particular study programme.

6. Motivation is reflected by the order of preference given by an applicant to a particular study programme in the application for admission to a higher school.
7. Study programmes in *Social Sciences* are approximately twice as popular as study programmes in *Technological Sciences*. Nowadays, *Social* and *Technological Sciences* are the most popular study programmes. In the last five years, the popularity of *Social Sciences* among applicants has been decreasing. In contrast, the popularity of *Technological Sciences* has been increasing.

References

1. Prentkovskis, O. The Anniversary: the Journal "TRANSPORT" – 20 Years Together! *Transport*, Vol. 21, No 4, 2006, pp. IIa–IIc. (Vilnius, Technika).
2. Kliukas, R., Prentkovskis, O., Daniūnas, A. Qualitative Analysis of the Knowledge of Applicants to Transport Engineering Courses of Study, *Transport*, Vol. 21, No 2, 2006, pp. 95–104. (Vilnius, Technika).
3. Prentkovskis, O., Kliukas, R., Daniūnas, A. The Popularity of Study Programmes in Transport Engineering and Telecommunication Engineering among the Applicants to Lithuanian Higher Schools. In: *Proceedings of the 7th International Conference "Reliability and Statistics in Transportation and Communication, October 24–27, 2007, Riga, Latvia*. Riga: Transport and Telecommunication Institute, 2007, pp. 200–208.
4. Website of Vilnius Gediminas Technical University – www.vgtu.lt
5. Website of General Jonas Žemaitis Military Academy of Lithuania – www.lka.lt
6. Kliukas, R., Prentkovskis, O., Daniūnas, A. A System of Joint Admission to Lithuanian Higher Schools: the Guidelines to Entrants. In: *11th Baltic Region Seminar on Engineering Education: Seminar Proceedings, 18–20 June 2007, Tallinn, Estonia*. Melbourne: Monash University UICEE, 2007, pp. 97–100.
7. Prentkovskis, O., Daniūnas, A., Kliukas R. Study Programmes in Transport Engineering and Telecommunication Engineering: Attractiveness among Applicants to Lithuanian Universities. *Transport and Telecommunication*, Vol. 8, No 2, 2007, pp. 4–13 (Riga, Transport and Telecommunication Institute)
8. Website of the Association of Lithuanian Higher Education Institutions for joint applicants' admission – www.lamabpo.lt
9. Database of Association of Lithuanian Higher Education Institutions for Joint Applicants' Admission. (In Lithuanian)