ПЕДАГОГІКА

УДК 371.3

R. Ginevicius
A.V. Valiulis
E.K. Zavadskas, Dr. Sci. (Eng.)

THE LATEST CHALLENGES FOR HIGHER EDUCATION INSTITUTIONS

Vilnius Gediminas Technical University, Lithuania, e-mail: edmundas. zavadskas @adm.vtu.lt

The beginning of a new millennium coincided with the period of renovation and reforms of universities. Universities should be the leaders and help the society to adopt new characteristic elements of learning and to become a learning society. Aviation is the leading field where the modern knowledge and advanced research are applied. It the article an experience of the Lithuania is analysed, Lithuania being a small country boasts a rich tradition in aviation and strives to participate in this area of study and research.

Introduction

A learning society is such where the habits of life-long learning are respected and supported. It develops flexible curricula and increases the possibilities of study choice for all its members. It stimulates the creation of knowledge with the help of scientific research, invention and otherwise and its use for the sake of society. It values the expansion of national and international co-operation and cultural relations and new communication possibilities provided by information technologies as a means of improving education. A learning society induces such intentions, which grant equal rights of education for everybody seeking for the competitiveness, economical and social welfare of the state.

In its activity the university must confirm that the conception of lifelong learning is one of the main components of its mission and that individual learning is not only an episode of life but the activity that will last all the life.

Magna Charta Universitatum states that a university is an autonomous organization being differently formed due to geographical situation and historical heritage, carrying out research and training; it creates, studies and estimates, imparting culture from generation to generation.

University and society

There are different systems of universities in the world. They differ even in the same state, region or town. First of all they differ according to the type of trained specialists. In the Middle Ages the aim of universities was to educate people, but not to train specialists. The growing industry required various specialists who were trained in traditional universities. Later on specialized universities were founded and the first of them were technical universities. Previuosly it was enough to multiply and spread knowledge. Now universities must develop person's views and influence his behaviour. Therefore preparing graduates for life, the following new factors must be taken into consideration:

– a graduate should be able to work in a team, often in an international one with people of different nationalities and mentality;

– he/she must quickly adapt himself/herself to changes;

– a graduate should be able to generate innovative ideas and novelties as well as to prove and legitimate them;

– he/she must be a universal specialist capable not only of solving theoretical problems, but to apply the results in practice;

– more attention should be paid to students to ensure a high level of their knowledge and the ability of applying it practice.

The system of higher education has to pledge itself to collaborate with the society in a new way:

– to make higher education accessible to all members of the society inspite of their age, race, nationality and economic conditions;

– to create conditions for civic development of young people, to train students as active members or leaders of a democratic society;

– to develop and offer the curricula for general training, fundamental engineering training and special training only of a high level;

– to propose complex, wide profile themes for master's or fundamental research adjusting them to the particular important needs of the research activity;

– to use resources and experiences of the institutions for the solution of not only its problems, but national or international ones as well;

– to estimate its activity systematically and with transparancy.

In midle of nineties in many countries the structure of students of higher schools has greatly changed because the character of work has changed due to the development of science and society.

People have understood that after the main studies it will be necessary to continue learning and perfect themselves all their life.

New challenges forced the universities to flexibly meet the needs of the labour market and organize a variety of postgraduate studies, evening classes, correspondence-form studies and studies through the Internet etc. Many older educated people would like to have an opportunity to satisfy their cultural and educational needs. But most of them cannot afford such studies due to their economical state and the state does not allow the means for such activities.

Referring to the latest publication of Organization of Economical Co-operation and Development (OECD) three new types of students can be distinguished: young adults, students of "a second chance" and those studying for a second time.

The first group contains rather young adults who are older than usual students of 18-24 years. Those of "a second chance" are adults who seek a higher education, but did not study while they were young. Studying for the second time are such students who have returned to the university to continue their education.

In the countries of OECD during eleven years (up to 1996) the number of students of 18-24 years has increased 70% and the number of students of 25-29 years has increased 50%. The average age of students has increased and the number of "a second chance" students also increased. Distance education can increase the number of such students in Lithuania, but it needs financing from the government's budget.

The experience of OECD countries shows that about 8% of adults of 30-64 years having secondary education study wishing to get diplomas of higher education. Even more, about 20% are enrolled for short study courses in one of higher schools. This data shows that higher education is not only for young people, but it becomes the need of the citizens of highly developed countries of the world. This is so because an uneducated person is a potential unemployed person. The data of the Lithuanian labour exchange confirm this statement. Only 5% of the unemployed have higher education, 15% of them have college education and about 30% have vocational education. Other unemployed either have not finished secondary schools, or having finished them, did not continue their education.

Many present students come to universities willing to acquire knowledge and skills for successful work. Employers require practical experience from the graduates, but they do not create conditions for practical activity of future specialists. University curricula lead students to an academic degree or profession. Preparing students for work universities determine the range of subjects, their integration and practical application. This inevitably decreases the part of fundamental sciences.

Trends in higher education system modernisation

Globalization is one more challenge for universities all over the world. The United Declaration of European Ministers of Science was signed in Bologna in 1999 on the 19th of June [1–3]. The processes of the reformation of higher education going on in many European countries are structuralized in the Declaration. It shows the resolution of these countries to work more effectively and closely. Politicians, the academic world and the whole society are striving to create the future Europe by developing and inducing intellectual, social, cultural, scientific and technological spheres.

A Europe of knowledge is widely recognized as a stable factor of social and human growth consolidating and enriching every European. It is able to provide its citizens with the necessary competences by meeting the challenges of a new millennium and it shows their belonging to the same social and cultural space. The co-operation of science is most important for creating a strong, peaceful and democratic community. The autonomy and independence of universities should help the systems of higher education and scientific research constantly to adapt themselves to the changing needs of society, requirements and scientific achievements. The co-ordination of the systems of higher education of states will require much effort and many practical activities. Much attention should be paid to the development of the competitiveness of European higher education and the increase of attractiveness of this system on a world scale, and a maintaining of the level of cultural and science traditions of the European countries [4; 5].

It is pledged in the Declaration [2] to create a space of the European higher education and to support the system of the European higher education in every possible way. For this purpose it is planned to introduce an easily understood and comparable among states, two-level system of scientific degrees: basic studies and postgraduate studies (master's and doctor's degree of studies), to implement credit accumulation and transfer systems and to support the international exchange of students, teachers and administration staff. It is important that a degree granted after the first stage of higher education will be recognized in the European labour market.

In Lithuania at present there are two models of studies. Most often the programmes are made in such a way that at the beginning various subjects are

studied and only later the training becomes specialized. Such a model is used in universities. The programmes of the second model forsee professional training from the very beginning of studies, but due to the lack of time it is not of a sufficient level. This model is used in most of Lithuanian colleges. Their graduates are more often unemployed than university graduates. This system of higher education is called a binary education system. Two-tier education was implemented in universities in accordance with Bologna Declaration and after Berlin communique (2003) this system included the third tier- Doctor's degree studies [6–8].

Considering the economical situation of the country and the needs of citizens, universities are trying to increase the number and flexibility of their curricula. New forms of training appear: distance education, continuous education, evening classes for those who work and study. But great flexibility may be risky because training institutions must guarantee a certain professional and subject level of programmes. Therefore tutorial and control structures must be created which, offering programmes for students, should not forget the needs of labour market. Universities should consider the needs of modern society and try to find "the golden mean" between fundamental studies and training for practical work [9].

Teaching experience shows that educational process must be "student-centered". Therefore universities have to:

– improve the teaching of the subjects directly connected with the student's future career in the first two years of the main studies;

– improve the quality of studies defining the aims of the studied subjects and showing the student's achievements;

– increase the student's responsibility, the part of his/her individual work and to stimulate creative research work;

– present more practical tasks in lecture rooms and laboratories and develop student's abilities for the solution of various theoretical and practical problems;

– stimulate members of the teaching staff to teach student's to perceive phenomena not as a sum of separate elements, but as the whole. Estimate all kinds of student's activity as indivisible whole.

– emphasize the importance of moral values, ethics and civic responsibility for future practical activity;

– greate special support programmes helping students to overcome their problems.

It is believed in Lithuania that colleges could solve problems of practical training, but they lack the scientific potential. Universities can probably better solve such tasks. This is confirmed by the structure of Lithuanian's unemployed. Some authors of the reform of education support colleges by opposing them to universities. This is hardly a rational way. The main problems can be solved only by means of collaboration and their integration and by applying some principles of globalization.

In reorganizing the system of higher education it is necessary to take into consideration that new information and communication technologies require to change the process of studies. It is a challenge for universities under conditions with insufficient financing. But these technologies open new perspectives. The role of a teacher changes greatly as far as conveying knowledge and being a mediator in the process of studies. Information technologies can guarantee not only flexible teaching, but independent learning as well and this is a challenge for universities. These technologies allow a university to proceed to such teaching methods as when a student, but not a teacher, is the main person. New technologies help to acquire more practical skills and develop self-organized studies. But even in future the direct tie between students and teachers will undoubtfully remain important.

It should be remembered that under present conditions when studies are insufficiently financed from the budget and the number of students paying for their studies is increased, it is difficult for universities to compete with private institutions preparing specialists of informatics, law, management and economics the training of which is more general and does not require special equipment or specialization.

These changes influence scientific research as well. Traditionally universities integrate research and training. This distinguishes them from other institutions of higher education. Research is a base of progress. If it is not enough financed and there are no possibilities to renew equipment, to acquire necessary materials and even to subscribe to scientific periodicals, financial problems are like shackles. Universities are searching for possibilities of co-operation with scientific centers in Lithuania and abroad. Some researchers go abroad and make use of the research equipment and scientific information there.

Universities must carry out fundamental research and cannot become only industrial experimental laboratories. Otherwise they will lose their main function of being the source of knowledge and the most effective means of rendering technological knowledge for the society.

During twelve years of independence Lithuanian higher schools based their activities on rather liberal Laws of Research and Higher Education ensuring many rights for universities. The autonomy of universities permits the creation and improvement of the system of research and studies by taking the way of evolution, but not revolution.

The interests of taxpayers should not be forgotten. A Society represented by democratic governments has the right to know about the main spheres of the university's policy and the use of State money. If a country is ruled by a far seeing authorities, research and education must be given real priority in financing which would cover minimal expenditures for teaching and training of a specialist. At present not enough money is assigned for students grants, new equipment and the maintenance of buildings.

The reformers of Lithuanian science recognize only fundamental researches. All applied sciences are inferior to them and a well knows axiom that "science is systematized knowledge" is considered as unacceptable. But the universal globalization of science is going on in political, cultural, economical technical and social aspects. Globalization can mean great competition and at the same time it includes an effective system of collaboration. Under the conditions of globalization a new generation is entering universities and have different needs and ambitious to gain an education of a new kind. This in its turn raises new tasks for scientific research. New kinds of services are expected from universities. This requires qualitative renovation of universities. The system of university co-operation with other institutions should embrace various institutions such as government, regional, local and town administration, enterprises and joint-stock companies. The aim and aspiration of such co-operation is the wish of universities to be needful for the country and its industry and to solve the problems together.

Aviation in Lithuania

Lithuanian military aviation was created in 1919. The first planes with Lithuanian colours took off on March 1. They were eight LVG C VI bought in Germany. According to the International Aircraft Convention (Paris, 1919) Lithuania declared "the airspace above the territory of Lithuania is governed by the Lithuanian state". In 1921 Lithuanian transport aviation began – aircraft of "Deutsche Lufthansa" and other companies flew from Lithuania to Berlin, Konigsberg, Moscow, Riga, Tallinn, Helsinki and Warsaw. In 1933 S. Darius and S. Girenas set out to bring fame and glory to their newly independent nation by embarking on an epic flight from New York to Lithuania. The plane left New York on 15th of July 1933 and flew across the Atlantic, covering 2,984 miles (6,411 km) in 37 h 11 min. Nobody knows exactly why, but it never reached Lithuania and crashed at Soldin in Germany. In 1938 the first airline "Lithuanian Airlines" was established and the first air route of the Lithuanian civil aviation was opened and the Directorate of Air Transport at the Ministry of Transport was founded (1938). Lithuania was annexed by the USSR in 1940 and Lithuanian air transport was incorporated within the jurisdiction of the Civil Aviation Ministry of the Soviet Union and the Aeroflot was the only airline servicing the USSR territory. In March of 1990, Lithuania became the first of the Soviet republics to declare its independence. With the re-establishment of Lithuanian independence, all natural resources and industries became the property of the Republic of Lithuania. This unavoidably caused many problems, and the 59 aircraft registered at Vilnius Airport became the subject of a heated political debate. In 1991, "Lithuanian Airlines" break away from "Aeroflot" and a state-owned company was established. The board of a new company realised that western aircraft were needed to facilitate integration into western markets. After assessing offers from the world's aircraft manufacturers, Lithuanian airlines chose the most commercially successful aircraft Boeing-737 to replace some of its aircraft. The expansion of civil aviation to the West meant meeting a lot of new demands. The company had experienced pilot, mechanics and flight attendants, but lacked experts in the fields of marketing and law. In 1993 Lithuanian Airlines joined IATA. This secured the company international recognition. The last Russian troops withdrew in 1993. Lithuania subsequently has started restructurisation of its economy (including aviation) for eventual integration into Western European market.

The area of Lithuania is only 65,200 km^2, but country has 25 airports with paved runways and 71 with unpaved runways (many of them under 914 m). One of the most important priority of Lithuanian transport developement is to integrate the Air transport system into Transeuropean transport network (TEN) and to gradually approach the technical standart rate of West European countries. There are 1677 licenced aviation specialists, 6 certified air flyers working in Lithuania. There also are 536 registered airplanes, and 4 international airports operating in Lithuania: in Vilnius, Kaunas, Palanga and Siauliai.

The specialists in civil aviation with a university degree have been trained in Lithuania since 1993 after the Aviation Institute at Vilnius Gediminas Technical University (VGTU) was founded [10].

In training aviation specialists the following goals are pursued:

– to ensure that the body of specialists conform to the present-day requirements of the Republic of the Lithuania;

– to ensure that the specialists are qualified to meet the ICAO and IATA requirements;

– to harmonise the study programmes to the present and future visions of aviation development;

– to minimise training costs;

– to instruct the graduates for the performance in the conditions of free market economy.

The Aviation Institute at Vilnius Gediminas Technical University provides a quality academic education for students in various fields of aviation. The students are trained in six professional fields: the aircraft piloting; the air traffic control; the aviation mechanics; the aviation electronics; the specialists in aviation electric equipment; the air transport management. For the fundamental engineering knowledge the facilities of VGTU Fundamental sciences, Electronics, Mechanics, Transportation, Environmental engineerin, Business management faculties are used. For the needs of special professional instruction training facilities of the Aviation Institute: simulation laboratory, flight training centre, air traffic control training centre, library, etc. are used.

The Aviation Institute is committed to delivering quality undergraduate and postgraduate education to students in programs offered in the department. The Aviation Institute mission in these technical and professional programs is to teach students not only the fundamentals of aviation but also the advance concepts related to the field of aviation. The success of these programs is a direct result of the periodic revision of the programs' curriculum. This allows the program to incorporate new and emerging technologies into curriculum, which is needed by the aviation. The Aviation Institute expertise is increased through activities, including attending national conferences, professional seminars and professional summer training activities. Students benefit from these activities by the direct transfer of knowledge and skills from the experienced people and by new and innovative teaching methods applied in different stages of teaching process. The academic exchange programmes between neighbouring and West European universities (UK, Sweden, Germany) and special schools help very much in this wide and specific educational process.

Taking into account a great demand for aviation specialists in Lithuania, their training was launched under extremely complicated conditions. Simultaneously the structure of the Aviation Institute was being shaped, the study model worked out, teaching staff qualified, study, programmes developed, technical bases of the Aviation Institute created, western experience of training aviation specialists applied, the process of studies organised in line with the ICAO and IATA requirements, first introduced in Lithuania only in 1990. All the available resources of Lithuania were used for the purpose - the potential of the scientific and teaching staff of VGTU, the production and training facilities of Lithuanian aviation, the aid of international projects.

Aviation industry in Lithuania, as Lithuanian industry on the whole, now experiences the period of crisis and stagnation. In Soviet times, Lithuania did not have its own aviation industry, as all aviation enterprises in its territory were subordinate to different (mostly military) structures of the USSR. Lithuanian aviation industry has a perspective only as a part of world aviation industry. Lithuania, as well as other countries having little raw materials, will be simply forced to export the most costly goods, i.e. the production requiring intellect and high qualification. The major obstacles that might impede the process are the following: the shortage of investments, the impotence of commerce and state regulaions providing proper conditions and infrastructure where independent enterprises could operate.

The challenges of a time beeing

However, recent inventions and technical achievements do not solve all the problems of mankind raised by humane traditions. In his book "Fides et retro" the Pope John Paul II wrote that the first drawback is the crisis of the sense, that a human soul is often occupied by the way of thinking fostering greater shrinking into oneself limited by stability of one self leaving no place for something higher. It is also written there that the world wide spread of science and technologies did not become the indicator of children's health, duration of life, literacy, equal possibilities, labour productivity and thrift use of means. It did not change the system of education and did not stop the ruin of towns and the pollution of environment. It did not make care of public health more accessible and did not decrease the largest in history national debt.

Thus, the main aim of universities is to become centres of humanism, training not only good creative specialists, but real humanists as well. Universities

must unite scientists of different fields, summarize and spread knowledge of various branches and investigate the problems of mankind. Only close collaboration with the society can help universities to meet its expectations and to solve all the important problems together.

Seeing the Lithuanian obligations stated in the Bologna Declaration VGTU can be proud that much has been done and is being done like in other universities. A successfully implemented three-thier model of higher education and credit accumulation and transfer system can be mentioned. Much has been and is still being done to make the university open to the world. Each faculty has study programmes are taught in English and this facilitates the student exchanges with the European higher education institutions participating in the Tempus, Leonardo da Vinci, Socrates and other European Union programmes [11; 12]. It can be stated that we do not stay off the space of the European higher education, but create it and integrate into it not only by getting, but by giving something in return as well.

At the junction of the millenniums life challenges universities. Much will depend upon the maturity of university communities and the cultural level of their students and staff. If we are not capable of training creative specialists with a global outlook based on humanism, we shall not meet the challenges of life in the future.

References

1. *Scott P.* Globalisation and the university // European universities, world partners. CRE action: Journal of the Association of European Universities. – 1999. – №115. – P. 35–46.

2. *Joint* Declaration of European Ministers on the European Higher Education Area // Bologna. – 1999. – 19 Jun.

3. *European* Commission. Strategic Planning and Management for Higher Education in Central and Eastern Europe. Final Draft. – Geneva, 1997. – 91 p.

4. *Scodvin O.J.* Mergers in higher education-success or failure // Tertiary Education and Management. The Journal of EAIR- a European Higher Education Society. – 1999. – 1, Vol. 5. – P. 65–80.

5. *Kehm B.M., Maiworm F., Over A., Reisz R.D., Steube W., Teichler U.* Integrating Europe through co-operation among universities. Jessica Kingsley Publishers. – London, 1997. – 346 p.

6. *Higher* education in Lithuania. Department of Science and Higher Education under the Ministry of Education and Science of the Republic of Lithuania. – Vilnius. – 2001. – 142 p.

7. *Documents* on Higher Education and Research in the Republic of Lithuania. Ministry of Education and Science of the Republic of Lithuania. – Vilnius: Leidybos centras, 1998.

8. *Cizas A.E.* Quality Assessement of Lithuanian Higher Education // Global Journal of Engineering Education. UNESCO International Center for Engineering Education. – Melbourne, 1997. – 1, 3. – P. 281–284.

9. *Zavadskas E.K., Valiulis A.V.* The Reform and Development of Vilnius Gediminas Technical University. – Vilnius: Technika, 1998. – 284 p.

10. *Prognosis* of the need for specialists with higher education (in Lithuanian) // Labour and Social Research Institute. Accounting of the second stage of research. – Vilnius, 1999. – 135 p.

11. *Study* Programs for Studying in English. Vilnius Gediminas Technical University, Vilnius, 1999. – 128 p.

12. *Impact* of the Tempus programme on the reform of higher education in Lithuania. – Vilnius: Alma Littera, 1998. – 126 p.

Стаття надійшла до редакції 11.02.04.

Р. Гінявічюс, А.В. Валюлис, Е.К. Завадскас

Сучасні вимоги до інститутів вищої освіти

Показано, як у новому тисячолітті, початок якого збігається з періодом реновацій та реформ у вищій освіті, університети адаптують характерні елементи навчання для становлення суспільства. Розглянуто досвід Литви, яка є маленькою країною, але пишається багатими традиціями в авіації, що займає лідируюче місце в області наукових досягнень, та активно використовує сучасні знання і передові дослідження.

Р. Гинявичюс, А.В. Валюлис, Э.К. Завадскас

Современные требования к институтам высшего образования

Показано, как в новом тысячелетии, начало которого совпадает с периодом реновацій и реформ в высшем образовании, университеты адаптируют характерные элементы обучения для становления общества. Рассмотрен опыт Литвы, которая, будучи маленькой страной, гордится богатыми традициями в авиации, занимающей лидирующее место в области научных достижений, и активно применяет современные знания и передовые исследования.