

Access of disabled people to engineering education

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ABSTRACT: The article deals with the integration of disabled people into engineering education through widening access. Each country has a fraction of the population that face some obstacles in entering, participating, gaining or completing education. People with disabilities acknowledge their disabilities at enrolment and request special services for access to informational sources. Changing social and economic conditions in Central and Eastern Europe have had a profound impact on the place of the disabled people in society. For a long time, society looked upon the disabled as helpless people who could not adapt to the surrounding environment by themselves. For many years, technical universities were not hospitable to disabled people's needs. The opinion prevailed that the best education choice for disabled people was the humanities. Following European trends in higher education, the Vilnius Gediminas Technical University, Vilnius, Lithuania, recently included certain measures concerning access for disabled people into the University's development plan for the social integration of disabled people into society. It is important to take their needs into consideration, the opportunities available and the obstacles that prevent disabled people from fulfilling their needs.

INTRODUCTION

Each country has a fraction of the population who face some obstacles in entering, participating, gaining, completing or continuing education. Lithuania is no exception.

Successful outcomes from education are complex rather than simple. People with disabilities are those who acknowledge their disabilities at enrolment and request special services for access to informational sources and, at times, special means for information transfer.

Changing social and economic conditions in Central and Eastern Europe have had a profound impact on the place of the disabled people in society. For a long time, society looked down upon the disabled as helpless and worthy of sympathy; generally, society felt that very few disabled persons could adapt to the surrounding environment themselves or with the help of professionals. For many years, technical universities were not hospitable to disabled people's needs. The main reason was the lack of goodwill. The notion that the best choice for disabled people would be humanities was prevalent.

Following the European trends in higher education, the Vilnius Gediminas Technical University (VGTU), Vilnius, Lithuania, has recently included certain measures into the University's five-year development plan that concern access for disabled people. Thus, it seeks the social integration of disabled people into society.

Several important factors must be considered. It is important to take the needs of disabled people into consideration, the opportunities that are available for them, as well as the various obstacles that prevent disabled people from fulfilling their needs.

DISABILITIES AND THE SURROUNDING ENVIRONMENT

Disabilities include the following:

- Physical;
- Intellectual;
- Psychiatric;
- Sensoric;
- Learning;
- Neurological;
- Disfigurement;
- The presence in the body of disease-causing organisms.

Accessible environments for disabled people include consistent linkages between communications, transport, buildings, struts and public areas to provide access to employment, education and other areas and facilities.

The main obstacles of social integration can be divided into two main groups of *external* and *internal* obstacles. *External* obstacles include: legal situation and physical conditions (transport, accommodation, elevators, toilets, learning facilities, etc). *Internal* obstacles cover: the educational level of the disabled, psychological readiness to integrate themselves into the environment of healthy people and the psychological readiness of the healthy people to accept the disabled into their environment.

Society should create the environment that would encourage and stimulate the disadvantaged people for personal, professional and social self-realisation. First of all, social integration of the disabled is directly related to their integration into the labour market, which directly depends on one's professional knowledge and skills. Thus, in seeking the social integration of the disabled people into society, it is first

important to take into consideration the disabled people's needs, the opportunities available and the obstacles that may prevent the disabled people from fulfilling their needs. Then, some extra means or opportunities should be established or created to make the gap between the needs and opportunities as narrow as possible.

LEGISLATION PROTECTING DISABLED PEOPLE

After regaining independence in 1990, Lithuania is attempting to become an equal part of the European community. This implies awareness and the respect of international policy documents, as well as creating its own legitimate basis of special education. Lithuania has already joined the United Nations (UN) and thus adopted the UN's Standard Rules. Lithuania signed the Salamanca resolution, the Convention on the Rights of the Child and is currently preparing for the full adoption of the *Acquis Communautaire* of the European Union, which also includes the European Social Charter and the EU legislation in force on equal rights.

The law on the Social Integration of the Disabled was adopted on 28 November 1991. This Law emphasises that the disabled can not be discriminated against and that they have the right to work, study and train, that, regardless of the cause, character and degree of their disability, they shall be entitled to the same rights as other residents.

The first basis in legislation for the integrated education of children with Special Educational Needs (SEN) is the document entitled *The Act of Special Educational Provision for Children with Special Educational Needs in Mainstream Educational Institutions* from 27 May 1993. *The Law on Special Education* of 15 December 1998 established the structure of the system of special education, as well as the administration and management of early and pre-school, general, supplementary, vocational, college, university and adult education of persons with special needs. Basic definitions of the Law (Article 3) defines that:

Persons with Special Educational Needs are children and adults, who because of congenital or acquired impairments have limited opportunities of participating in the educational process and social life.

This document increases state responsibility for providing free and appropriate education for all youngsters (ranging in age from 0-21 years old) with *special educational needs* in the *least restrictive environment*, providing all the needed supplementary aids and services and assuring that the rights of children and their parents/guardians are protected. The document *Principles of Special Education* (Article 4) lists the principles of special education: equal opportunity, integration, decentralisation, universality of education, flexibility and educational functionality. Article 25 regulates the provision of education-assisting technology and training appliances, while Article 27 describes transportation to an educational institution.

THE QUANTITY OF PEOPLE WITH SPECIAL EDUCATIONAL NEEDS (SEN)

According to the data [1] pupils with Special Educational Needs (SEN) comprised 9% of the student population of 0-12

grades. Figure 1 provides a breakdown of this figure with regard to disability [1].

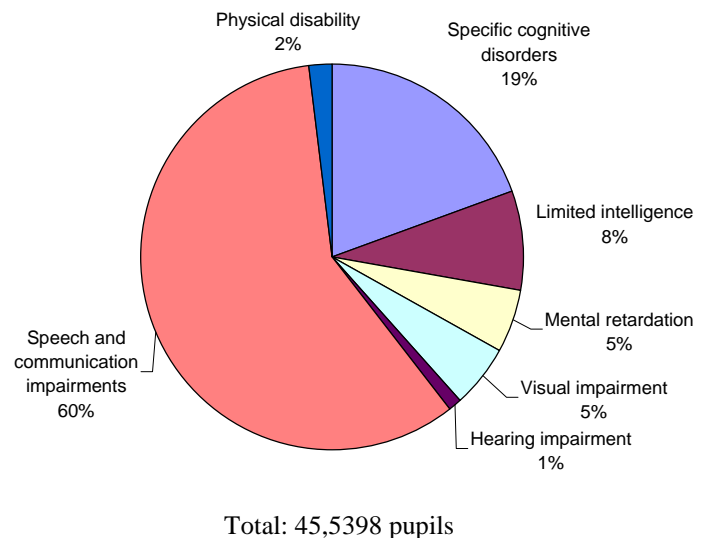


Figure 1: Special educational needs for children in general classes of mainstream schools at the beginning of school year 2000/2001 [1].

European countries have quite different approaches towards the education of pupils with SEN. Some countries segregate high proportions of their pupils in special schools or special classes. Other countries educate only small proportions of SEN pupils in separate provision [3]. These differences, which may vary between less than 1% to more than 5%, are the result of many factors: differences in history, policy, demographic and geographical factors, but also to different societal views on disabled people and the resulting approaches in providing for them. The Ministry of Education and Science of Lithuania lists the following problems:

- Lack of specialists: Children with SEN, families, teachers and school administrators cannot be provided with the necessary assistance due to the lack of specialists.
- Mainstream schoolteachers lack the necessary knowledge in how to deal with children with special educational needs in the general classroom; this is particularly so for the older generation of teachers.
- *Money still does not follow a child*: The new model of financing the educational system must be introduced in the nearest future in Lithuania.
- Lack of financial resources, which are necessary for the implementation of the policies.

NEW TOOLS OF LEARNING

The development of the post-industrial information society has become the precondition of successful state and societal development. The post-industrial information society is distinctive for its rapid changes in all areas of human activity closely connected with the system of life-long learning, training or studies, which meet individual needs and societal interests and continue throughout all stages of human life.

In the contemporary learning information society, one of the most promising ways to improve the quality and opportunities of *conventional* education for the professional education of the disabled is the promotion and development of the distance

education system. Modern distance education is, first of all, orientated to the learners' needs. It allows studying at any time, at any place and at a personal pace without giving up professional activities and changing the place of residence.

The establishment of the infrastructure for a modern distance education system is directly related to the infrastructure of informational technologies in all spheres of the national economy and the level of computer literacy among the population. When creating the system of distance education, it is necessary to establish a well functioning macro and micro learning environment. This includes:

- A legal basis for distance education.
- Developed computer networks and other means of telecommunication adjusted to distance education.
- A system of training and professional development for organisers, lecturers, consultants, tutors, etc.
- A support system for the development of distance education programmes.
- A system of quality evaluation and quality assurance for distance education programmes.
- A system of support for the students of distance education programmes.

In planning to develop a distance education course for the disabled, it is necessary to be aware of the physical, psychological and intellectual abilities related to the type of disability and the additional requirements for distance education courses for the disabled. This includes teachers' preparation, study materials and its forms, technologies used and the adjustment of the environment (entrances, doorways, elevators, toilets, etc). The peculiarity of distance learning is the lack of a traditional teacher-to-student and student-to-student communication and cooperation.

Figure 2 shows that about 30% of disabled people have been disabled since birth.

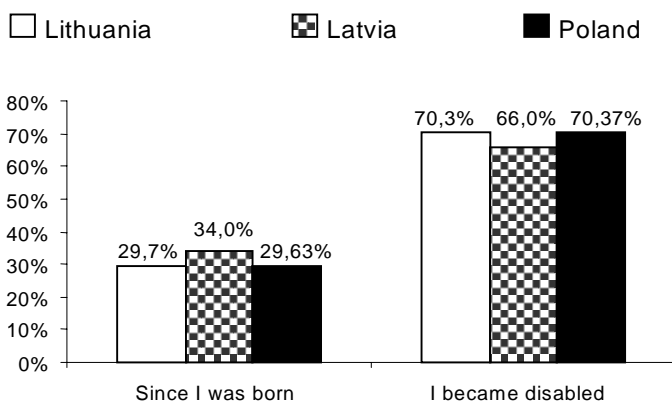


Figure 2: Response to the question: *When did you become disabled?* [2].

The *SOCRATES* project ADIS survey showed that the distinct need for computer skills among the disabled people is indeed very high [2] (see Figure 3). All of them would like to attend fee-free computer courses. A great need for computer skills is the main problem most of the working disabled people face. The lack of education and computer skills together with difficult current Lithuanian economical

situation and the ostracism of disabled people are among the most important obstacles, which prevent them from finding a job.

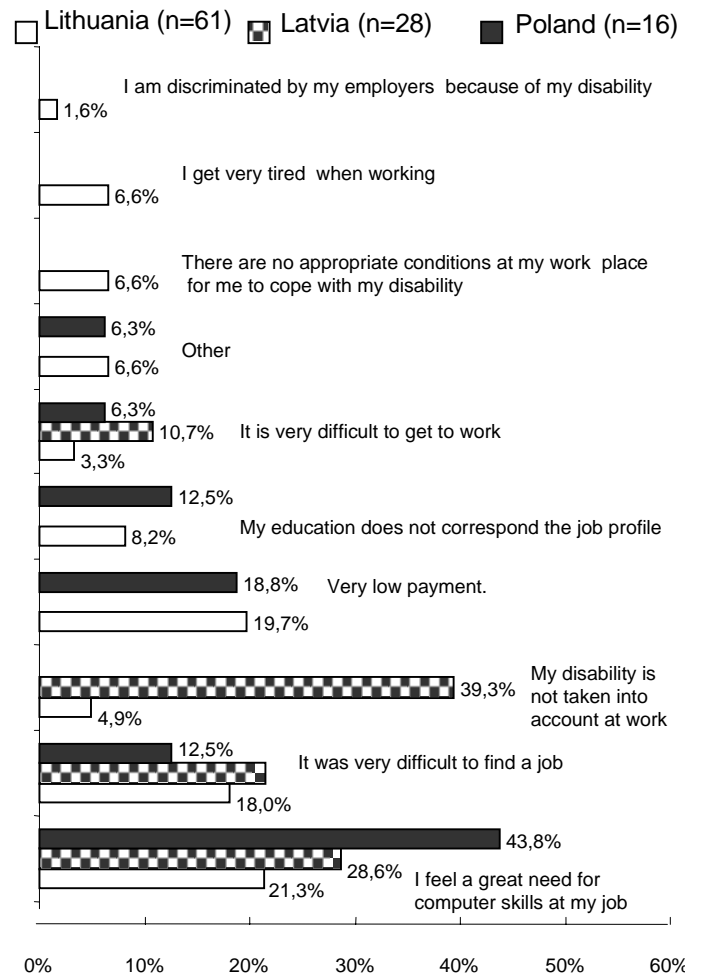


Figure 3: Most important difficulties working persons have to face [2].

Figure 4 displays the level of education attained by SEN people in Lithuania, Latvia and Poland.

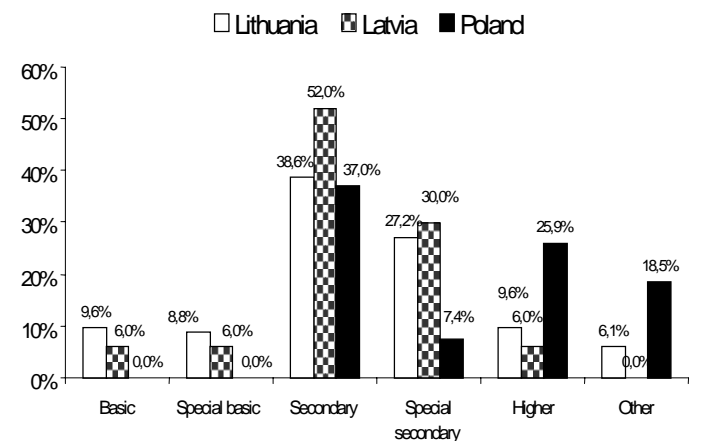


Figure 4: Education of SEN people [2].

Figure 5 illustrates the level of computer skills of SEN people in Lithuania, Latvia and Poland. It shows 35.2% of SEN people in Lithuania have never tried to work with a computer, but that 30.6% have tried to work with a computer on several occasions.

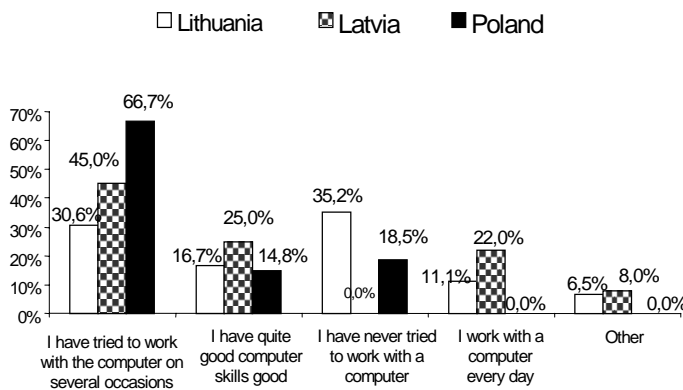


Figure 5: Computer skills of SEN people [2].

One of the general conclusions of this survey was that the development of distance education is one of the most promising ways to increase the opportunities for the traditional professional education system for the education of the disabled. This will also contribute to the development of a modern professional education system.

IMPROVING ACCESS FOR DISABLED PEOPLE AT THE TECHNICAL UNIVERSITY

For many years, the technical university was not hospitable to disabled people's needs. The main reason for this was the general lack of goodwill. Indeed, many thought that the field of humanities was the best choice for disabled people.

Following the European trends in higher education, the VGTU recently included some measures devoted to the improvement of access for disabled people into the University's five years development plan. These general measures will be transferred into an action plan that will be the basis for the development of a collaborative partnership.

In the University today, there exist many separate actions and activities that are directed to solving the various problems encountered by disabled people. The main directions of the activities are as follows:

- Making the current University building and other facilities universally accessible for disabled students.
- The development of a flexible assessment system.
- Counselling and guidance support.
- Agreements with social welfare institutions and entrance quotas for disabled people.
- Development of distance education courses for disabled people (eg with laboratory experiments).
- The development of Internet classrooms together with the national network LITNET. These classrooms will be located in different country areas and accessible for disabled people.
- Improving the accessibility of distance education programmes for some groups of disabled people.
- Campus transport development.

In 1993, the Faculty of Mechanical Engineering at the VGTU started the study programme entitled Biomechanics. Here, the students are taught physiology and movement problems. In their course papers and practical works, they must investigate how to compensate physical and physiological problems of disabled people with the help of technical devices.

The students and professors have created the hearing device for deaf people. The devices were subsequently advertised at the Hanover Fair. The students and staff of the Faculty also work in the area of developing endoprostheses. Together with the State Rehabilitation Centre, the modelling of artificial heart elements is also being investigated.

The Faculty currently cooperates with the Association of Disabled People and the State Rehabilitation Centre. The means have been allocated for improving the entrance to the Faculty premises for disabled people and at the background of projects. According to the agreement of cooperation, the disabled persons (people with movement problems, etc) are encouraged to enter the Faculty and the programme of Biomechanics.

In conclusion, the VGTU totally agrees with the opinion published recently that:

The universities cannot solve the problems of poverty that force people into work rather than study, or combinations of the two. However, it is well within the capacity of the institutions to alter those things about themselves that create or heighten the difficulties that students, or potential students, experience [4].

Elements that universities can address include trying to improve access for disabled people.

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