

THE FORMER SOVIET UNION

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Summary

An overview of the development of higher education in the former USSR and in Russia is given. The contemporary state of Russian engineering-technological higher education is discussed through the prism of sustainable development concept. It is shown that the technocratic approach provides a way to education for sustainable development in the leading technical universities of Russia. The important role of chemical-engineering education in solving environmental problems is stressed.

1. Introduction

The higher education system of the former USSR was an integral part of the complex socioeconomic sphere of the country.

All of the republics and economic regions in the Union had wide nets of higher education institutions with a total enrollment of more than five million students (see Tables 1 and 2). About 850 000 specialists graduated annually. All of the 15 million Soviet graduates of higher education institutions were employed in the national economy. One out of nine people employed in the economy was a university graduate. This figure is an example of how the tasks of raising the educational and professional levels of working people and of developing the intellectual potential of society can be accomplished efficiently in a short period.

The higher education institutions had two tasks: first, to train qualified specialists for the national economy; second, to be a significant component of the scientific potential of the country. The staff of the various institutions included more than 20 000 Doctors of Science and about 220 000 Candidates of Science (equivalent to Ph.D.) who, apart from lecturing, were very active in the development of new science, research and advanced technology, and resolution of social problems.

This article explains the organizational pattern, functions, and tasks of the higher education system as well as its current state and prospects. The Appendix includes tables of statistics that illustrate trends in university education in the former Soviet Union up to 1988.

2. Organizational Patterns and Management

A uniform system of public education functioned in the former Soviet Union. By constitutional mandate, this system provided the general educational and professional training of the citizens of the USSR, the moral and physical development of young people, and preparation for employment and social activity.

2.1. Basic Principles

The basic principles of the public education strategy in the Soviet Union may be summarized as follows:

- Equal rights to education for all Soviet citizens, irrespective of social or economic

status, race, nationality, sex, spoken language, attitude to religion, type of employment, place of residence, etc.

- Universal secondary education as well as vocational training for young people
- Public ownership and management of all educational establishments
- Free tuition at all educational establishments; free day-care centers for a certain proportion of the families with pre-school and primary school age children, the costs of which were fully covered by the state, free textbooks in the schools, and state aid to students of all levels by means of stipends and grants
- Freedom of choice among the languages of the Soviet Union and languages of instruction
- Uniformity and continuity of the institutions and the programs making up the system of public education; easy transition of students, based strictly on academic qualification, from lower to higher levels of education and from one institution to another
- Close links between the education of young people and their preparation for life and entry into society through socially useful productive labor
- Constant improvement of content of educational programs through application of the latest achievements in science, technology, and culture
- Inculcation of humanitarian principles and high moral standards
- Secular education, uninfluenced by religion
- Coeducation for women and men.

The Soviet public education system included pre-school education, general secondary education, vocational technical training, specialized secondary education, higher education, and extra-curricular education, as well as postgraduate programs, doctoral courses, and continuing education programs.

3. Higher Education

Educational programs and individual courses at higher education level were offered by universities, academies, factory-sponsored higher technical institutions, and other institutions of higher learning. These institutions admitted only students who had completed secondary education. Average undergraduate programs lasted four to five or more years and were concluded by the defense of graduation theses or diploma projects. Graduates were awarded diplomas specifying their qualifications (e.g. engineer, medical doctor, agronomist, economist). Higher education courses were offered by full-time, evening, and correspondence mode. At the end of the 1980s about 53% of students were being trained full-time, 12% in evening divisions, and 35% in correspondence divisions (see Table 3).

3.1. Purpose and Goals

The main purpose of higher education was to train highly skilled, educated specialists with in-depth knowledge of the theory as well as full mastery of the practical skills needed for practicing their professions. These specialists had to be versed in contemporary economic theory and be able to make practical use of scientific achievements. They were to participate actively in socioeconomic and scientific development, in organization and management, and in sociopolitical and educational

activities. Therefore, higher education institutions were set the following tasks:

- Fostering in students a responsible and creative approach to studies and labor to make them disciplined, well-organized, cultivated individuals able to handle state property with care and to protect nature
- Providing formal education to students and sensitizing them to their social duties as well as their rights and obligations as Soviet citizens
- Providing aesthetic as well as physical education
- Ensuring a proper blending of all aspects of education to produce graduates who were well-developed mentally and physically, as well as being harmoniously well-rounded from a cultural point of view
- Conducting research that, on one hand, improved the training of specialists and promoted socioeconomic development and progress in science and technology and, on the other hand, had practical application for putting results into practice
- Training researchers and teaching staff workers and perfecting the qualifications of both categories of personnel
- Providing continuing education for graduates.

The graduates of higher education institutions were awarded diplomas, which qualified them to continue their studies in postgraduate programs.

3.2. Types of Institutions

The various higher education institutions of the USSR constituted the basis of the higher education system. They included universities, engineering and technical institutes, agricultural institutes, institutes of law, medical schools, teacher training institutes, and institutes of art and cinematography. The institutes functioned according to the Regulations for Higher Education Establishments endorsed by the Council of Ministers of the USSR and rules that had been worked out by each individual institution on the basis of these regulations.

3.2.1. Universities

At a time of great progress in science technology, the role and scope of university education was continuing to expand. At the end of the 1980s, the country's 69 universities were providing training for 583 000 students. Of these, 121 000 were newly enrolled, and more than 91 200 graduated from the universities that year. The universities were primarily responsible for the training of research workers and teachers in the humanities, the natural sciences, psychology, political economy, etc.

In the 1990s, more and more university graduates were needed in industrial and agricultural production as well as in the service sector, particularly in the information area. Also, because the system of education was expanding rapidly, there was a growing need for teachers. Although the teacher training institutes were designed to satisfy the need for teachers, secondary schools gave preference to the employment of university graduates because the latter had been trained to a higher scientific and pedagogical level than graduates of the teacher training institutes. The same was true for specialists in sociology and psychology.

At the time of *perestroika*, university graduates faced with new tasks of great importance. They were called upon to make use of the most advanced scientific achievements at all levels of the education system. It was necessary to enhance the role of the universities in the training of the personnel who were to be engaged in the social and the natural sciences in the institutes of theoretical and applied sciences. In order to train specialists in a profound knowledge of the fundamental natural sciences, the leading universities of the USSR needed to set up special departments and faculties for training and retraining specialists in the research required for use in industry, in agriculture, and in the public health services. Universities were designed to be able to advance the national scientific and technical potential, to contribute to the rapid socioeconomic development of individual regions, and to become genuine centers of science and culture.

3.2.2. Engineering and Technical Institutes

The polytechnic, industrial, engineering, transport, and other kinds of engineering and technical institutes also ranked among the most important of higher education institutions. At the end of the 1980s, about 2 149 000 students were being trained in 280 institutes of this sort; a total of 483 000 were admitted that year, and 309 000 of them graduated.

Efforts to reform higher education were also directed at engineering education. If Soviet industry was to be competitive, engineering and technical personnel had to be capable of introducing radical transformations into technology, reorganizing production methods, and increasing the productivity of labor. Therefore new training methods were required to broaden and deepen the theoretical knowledge of engineers. They had to master the fundamentals of engineering and of management and to receive improved practical training through work in production.

3.2.3. Agricultural Institutes

Agricultural workers were trained in more than 100 agricultural institutions, academies, and institutes. These institutions had a total enrollment of 520 300 at the end of the 1980s; over 107 000 were admitted to agricultural institutions, and 76 000 graduated. The principal guidelines of *perestroika* stressed that accomplishing the food program of the USSR hinged on improved agricultural education. Specialists in agriculture were trained to master the most advanced technologies in horticulture and animal husbandry, taking into account the industrialization of agriculture and agro-industrial integration of production, as well as the adoption of cost accounting in the state and collective farms.

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Bibliography

Berezovsky A. and Bolotin I. (1997). Scientific and pedagogical of problems higher school. *Vuzovskie Vesty* **12**. [in Russian.]

Handbook for Entrance to Higher Educational Institutes of the USSR in 1988 (1989). Moscow: Vysshaya Shkola. [in Russian.] [Gives the scope of knowledge students should have in order to enter university.]

Manual Juridical (1978), Vol. 1, 400 pp.; Vol. 2, 359 pp. Moscow: Vysshaya Shkola. [in Russian.] [Gives some statistics on the Soviet system of education.]

Savel'yev A.J., Zuev V.M., and Galagan A.I. (1990). *Higher Education in the USSR*, 94 pp. Bucharest: CEPES, UNESCO. [Gives a broad view on the educational system of the USSR.]

State Institutions of Higher Education. Handbook on the State of Higher Education in the Regions (1997). Moscow: Scientific and Research Institute of Higher Education. [in Russian.] [Gives a broad view on the educational system of Russia.]

Biographical Sketches

Victor F. Zhilin was born in Moscow in 1937. After graduation from high school he entered Moscow Institute of Chemical Technology, named after D.I. Mendeleev. In 1959 he received a Master of Science in chemistry with honors from Mendeleev Institute. In 1965 he received a Ph.D. in chemistry, and in 1978 was awarded a Doctor of Science in chemistry from the same institution. He was appointed an associate professor at Mendeleev Institute in 1978 and became a full professor from 1979. He is a regular member of the International Higher Educational Academy of Sciences. Since 1976 he has been the vice-rector of Moscow Institute of Chemical Technology named after D.I. Mendeleev (in 1992 renamed the D. Mendeleev University of Chemical Technology of Russia) for educational process. His fields of scientific interest are the chemistry and technology of nitrocompounds, and higher education.

Savel'yev Alexandre Yakovlevitch holds a Doctor of Science and is director of the Sciences and Research Institute of Higher Education, expert in the field of education of the former Soviet Union and Russia, and author of more than 200 articles, books, and monographs. He is involved in UNESCO educational activities.