EDUCATIONAL SYSTEMS: CASE STUDIES AND EDUCATIONAL INDICES

L.N.Strekova
D. Mendeleyev University of Chemical Technology of Russia, Russia

V.S.Arutyunov
Semenov Institute of Chemical Physics, Russian Academy of Sciences, Russia

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Contents

Summary

The transition of the post-industrial world to information technology enormously increased the role of the human factor, the so-called “human capital” in modern society. It determines the very high value of education today and its desirability to the overwhelming majority of young people entering their working lives. The transition to mass higher education and the globalization of world economy pose some very important questions concerning educational quality, differentiation of fields of knowledge, unification of the educational systems of various countries, developing new ways of delivering high-quality knowledge to any part of the world, and so on. Humanity is having to develop common principles and standards to make it possible for any person to upgrade his or her personal educational or professional level for life.

1. Introduction

On the threshold of the new millennium humankind has been faced with a sharp change in the role of education in modern society. From the privilege of a sparse elite interlayer it has turned into a vital need for the normal life and working activity of the overwhelming majority of the populations of both industrially developed and developing countries. The educational level of the population has become a main factor determining the development of productive forces in society and, accordingly, the level

of income and quality of life. It has notably increased the value of education, having made it a desired purpose for millions of young people entering productive life all over the world. Governments, having realized the direct relationship between the welfare of their countries and the mass educational level, began to pay much attention to this problem. The support of these efforts by industrial circles, militaries, and public opinion has made the problems of development of a national education system dominant among public concerns and efforts for the majority of countries. On the other hand, the sudden globalization of world economy, development of communication facilities and increased migration have transformed a problem of quality and unification in education into one of global proportions. Without the solution to this problem, it is difficult to ensure the sustainable development of humankind.

It is no wonder that the educational level, along with the level of public health services and the standard of living, forms the basis for the definition of an index of human development, by which the experts of the United Nations Organization estimate the level of human development in different countries. It is determined as a combination of two parameters -- the degree of literacy of the adult population and the degree of coverage of the population by three levels of education (primary, secondary and higher).

2. Information Technologies and Human Capital in Post-Industrial Society

The period of formation and development of post-industrial society, which step-by-step comprises all humankind, has demonstrated the roles which information technology and human knowledge play in production of high-performance goods and services. Industrial capital has conceded superiority to human capital, which became the main productive force. In the 1980s in the majority of industrially developed countries the total sum of incomes obtained from earned capital was several times less than the sum of the incomes from knowledge and skills as a wage. Therefore governments invest vast sums in the development of national educational systems, considering them as investments in the future of the nation, because the educational level is, first of all, a capacity of a nation to perceive and to assimilate new ideas and to master new technological achievements. For a nation the successful training of human power for highly professional activity means maintenance of high economic efficiency at the high wage level. Industry willingly invests in education, considering one of the most profitable areas of capital investment, ensuring fast increase in incomes and in competitiveness of manufactured products. The population also willingly pays educational services, as a rise in educational level provides significantly higher increases in incomes and welfare.

3. Transition to a Public Higher Education and Development of a System of Educational Services

Development of advanced technologies, and mass increase in income level have induced mass demand for highly educated specialists both for industry and for services. Now in developed countries up to 50 % of secondary school graduates receive one or another level of higher education; i.e., higher education has already become a public phenomenon, like primary or secondary education.

The transition to a public higher education has initiated the industry of educational services, which has some customers. The main one is the state. The majority of countries are still bearing the biggest portion of the expenditure on higher schooling. Students bear the second largest expenditure. Third are the employers. Different customers have different requirements in the quality of educational services.

State expenditure on education does not give the full picture of national investments in human capital. In many countries a considerable portion is paid in the private sphere of education. The ratio between the state and private sphere of education in different countries does not correlate directly with the levels of average income in the country and varies over a wide range. Among countries with low levels of income it varies from 20 % (Sri-Lanka) to 60 % (Uganda, Vietnam), and among countries with high levels of income from 5 % (Austria) up to 50 % (Switzerland). In the majority of countries the state provides free primary and quite often secondary education, which makes available to all citizens full-range participation in public and economic life, from which society as a whole benefits also. At the same time in high schools, both state and private, there is usually a charge for training as more of the benefits of higher education go directly to graduates of high schools.

4. Differentiation of Fields of Knowledge and Unification of Educational Systems

The transition to a public higher education, the value of which developed countries increasingly realize, has given rise to many problems about its quality. How is it possible to educate effectively the increasing quantity of students at practically the same cost? How is it possible to correlate the traditional requirements to received knowledge with the realities of these new times -- with globalization, internationalization of learning processes, fast differentiation of fields of knowledge, and an information revolution in education?

Statistics demonstrate that only 20 % of the people receiving a higher education then work in the originally chosen profession. Swiftly developing and often fundamentally changing, major manufacturing processes demand that individuals sometimes have to master new professions several times during their working lives. These circumstances dictate the necessity of broad fundamental education permitting easy mastery of new areas. On the basis of fundamental education, both narrow specialization for particular areas and training of scientific elite for the creation of new basic knowledge can be conducted.

The globalization of the world education system and fast differentiation of fields of knowledge have raised the question of the unification of educational systems of different countries. For this purpose in the early 1970s UNESCO designed The International Standard Classification of Education (ISCED) to serve as an instrument suitable for assembling, compiling and presenting comparable indicators and statistics of education both within individual countries and internationally. It presents standard concepts, definitions and classifications. ISCED covers all organized and sustained learning opportunities for children, youth and adults including those with special needs, irrespective of the institution or entity providing them or the form in which they are delivered.

ISCED is a multi-purpose system, designed for education policy analysis and decision making, whatever the structure of the national education systems and whatever the stage of economic development of a country. It can be utilized for statistics on many different aspects of education such as statistics on pupil enrolment, on human or financial resources invested in education or on the educational attainment of the population. The basic concept and definitions of ISCED have therefore been designed to be universally valid and invariant to the particular circumstances of a national educational system. However, it is necessary for a general system to include definitions and instructions that cover the full range of education systems. The ISCED classified educational programs by their content along two main axes: levels of education and fields of education. The years of application of ISCED by national authorities and international organizations have shown the need for its updating and revision. This would further facilitate the international compilation and comparison of education statistics and take into account new developments and changes in education and anticipate future trends in the various regions of the world, such as the multiplication and growth of different forms of vocational education and training, the increasing diversity of education providers, and the increasing recourse to distance education and other modalities based on new technologies.

The present classification, now known as ISCED 1997, was approved by the UNESCO General Conference at its 29th session in November 1997. It was prepared by a Task Force established by the Director-General for that purpose and it is the result of extensive consultations of worldwide representation. ISCED 1997 covers primarily two cross-classification variables: levels and fields of education. UNESCO's data-collection program will be adjusted to these new standards and Member States are invited to apply them in the reporting of education statistics so as to increase their international comparability.

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Biographical Sketches

Ludmila N. Strekova was born at Usman, Lipetsk (Russia) August 1, 1954. In 1977she graduated from Voronezh State University, Biological Department, Chair of Biophysics. Since 1977 she worked in Semenov Institute of Chemical Physics, Russian Academy of Sciences, in the field of photosynthesis, photochemical conversion of solar energy, ESR and molecular spectroscopy. In 1987 she received her degree: Candidate of Chemical Sciences (equivalent to Ph.D) in Semenov Institute of Chemical Physics, Russian Academy of Sciences. Topic of the thesis: "Tunneling of electron in reaction centers of photosynthesis and in model systems". Since 1997 worked as a lecturer and than assistant professor in High Chemical College of Russian Academy of Sciences. Since 2000 has been assistant professor in Institute for the problems of sustainable development of D. Mendeleyev University of Chemical Technology of Russia. Now she is assistant professor in D. Mendeleyev University of Chemical Technology of Russia and assistant professor in Moscow State Pedagogical University. Her scientific interests include: photochemistry of porphyrins, electron transfer in tunnel reactions at natural photosynthesis and in model systems, ecological problems of energy, sociological problems of science and education, professional sociology of scientific community, humanitarian aspects of scientific activity, and the problems of sustainable development. She has published about sixty scientific publications, in including monographs, Russian and English.

Vladimir S. Arutyunov was born at Moscow (Russia), June 6, 1946. In 1970 he graduated from Moscow Institute of Physics and Technology, Department of Molecular and Chemical Physics. Since 1970 he has worked in Semenov Institute of Chemical Physics, Russian Academy of Sciences. Now he is a head of Laboratory of hydrocarbons oxidation and professor of Chair of Gas Chemistry in Gubkin Russian State University of Oil and Gas. Has forty years of scientific activity in the field of gas phase kinetics, study of elementary chemical reactions, kinetic modeling of chemical processes, flashphotolysis, ESR, resonance-fluorescence and molecular spectroscopy. In 1979 received in Moscow Institute of Physics and Technology degree: Candidate of Physical and Mathematical Sciences (equivalent to Ph.D). Topic of the thesis: "Experimental Study of Some Reactions of Fluorine Atoms and Trifluoromethyl Radicals". In 1993 received in Semenov Institute of Chemical Physics, Russian Academy of Sciences degree: Doctor of Science. Topic of the thesis: "Kinetics of Gas Phase Processes in Carbon and Sulfur Containing Systems". His research interests include: elementary chemical reactions in gas phase including multi-channel reactions, chain-branched processes of oxidation and sulfurization, oxidative conversion of methane and other saturated hydrocarbons, kinetics of complex gas phase reactions, kinetic simulation, conversion and processing of natural gas, ecological problems of energy and transport, sociological problems of science and education, professional sociology of scientific community, humanitarian aspects of scientific activity, and the problems of sustainable development. He has been responsible for over two hundred and sixty scientific publications, including monographs, in Russian and English.