

**VOCATIONAL TRAINING
SOME PROBLEMS AND CONTEXTS**

PAŃSTWOWA WYŻSZA SZKOŁA ZAWODOWA W CHEŁMIE
CHEŁMSKIE TOWARZYSTWO NAUKOWE

VOCATIONAL TRAINING SOME PROBLEMS AND CONTEXTS

Edited by:

Halina Bejger, Halyna Rusyn

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Reviewers:

Doc.dr Nadežda Leonyuk

Brest State University A. S. Pushkin, Belarus

Doc. Pead Dr Anton Lisnik

Institut Stefana Nahalku v Poprade, Slovakia

DTP and cover design:

Mariusz Maciuk

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TENDENCIES OF PEDAGOGICAL PROCESS DEVELOPMENT IN HIGHER ENGINEERING SCHOOL OF RUSSIA

Qualitative renewing of higher professional school of Russia, the improvement of specialists of higher qualification's training acquires the prime significance nowadays.

The integration of higher engineering school of Russia into the international system makes for the use of world experience and the achievements of science, engineering and education in community's interests, the rise of the quality of specialists' training, the development of international cooperation up to co-production. All over the world the overestimation of an engineer's role takes place. The role of an engineer in social progress, the protection of the environment, harmonic existence of mankind and nature is increasing.

Russian higher school faced a very complicated problem: to integrate into the international system of education, having saved the best traditions and having provided the graduates with international qualification qualities. The qualification requirements to a specialist have changed essentially. At present it is necessary for a specialist not only to have subject knowledge and skills but the intelligently - spiritual development of a person is also required so a specialist should be professionally and socially competent. The transference of culture accumulated by society to younger generations, realized in a broad meaning (knowledge, skills, technologies, moral values, code of behaviour, views on the world etc.), represents indispensable conditions of survival, reproduction and progress of mankind.

The traditional system of education has absorbed many features typical of the production sphere: the stiffness of organisation and management, the absence of essential link between structural units and their narrow

functionality, age, sexual, social, physical restrictions for the promotion in educational system, deadlock directions in teaching. The educational institutions for working adults were limited by professional training. Only some separate philanthropic, political or religious organizations were involved in educational work among adults.

The contents of pedagogical process were reduced to remembering and reproducing the educational material. The main motive of learning was competitiveness between the students based on examinations, marks and punishment. Such qualities as needs, requirements, psychological characteristics usual for human nature were not taken into account in the educational system. The increasing break between the existing system of education and new living conditions became the reason of a system's "crisis" and demanded for its reorganization. "Like the adult can not wear clothes suitable for him in childhood, - the outstanding figure of education of the USA F. Kumbс wrote, - so the system of education can not resist the requirement of changes, when everything around is changing"¹.

The idea about "single" nature of the teaching process was put as a base in the classical system of education activity. Teaching was considered to be a stage of preparing a person for his future life. It was also considered that during the process of teaching the person should master all totality of knowledge necessary for him in his life. The static vision of a usual man's course of life was represented as successive, many times repeated passing of the same situations. This understanding led to the conclusion of the possibility of division both the processes of getting and applying knowledge and the experience of a person.

Such an idea about a man's course of life and the possibility of providing with knowledge "for reserve" defined the practice of traditional educational system.

The acceleration of a knowledge renewing system has made an actual problem to teach a person during the whole period of his professional activity. At the same time the ideas of uniqueness of a man's course of life, dealing with the original passing by each of us through the system of

¹ Ф. Кумбс, Кризис образования: системный анализ, М. 1970.

problem situations and the uniqueness of personal experience, defining the system of educational needs became more and more evident.

The variety of man's courses of life developed through the solution of problem situations changes the image of educational practice in conditions of dynamical changes in the life of individual, society, state considerably. The conception of "single" education transmits to multiple education realized during the whole life of a person. From a continuous, sad period of filling up the person with knowledge "for reserve" the education becomes shorter, oriented to the needs of a person ².

The formed technocratic practice of higher school directed to the narrow pragmatic aim – to train specialists - produced phenomena negatively effected on its moral climate. The spirit of search, darings, innovation has left the higher school. The general, global aim, dealing with supporting the cult of culture, has disintegrated to a set of small particular subaims - to receive a diploma, to defend a thesis, to hold a post.

The training in higher engineering school is directed to the aims of education arisen on the stage of engineering revolution. This stage was connected with the epoch, when progress went first of all not only on the way of creating the new technologies but also devices introduced in active, stable enough technologies. The system of engineering knowledge being rather stable and invariable had the prime meaning. That is why the system of education, the forms and methods of teaching adopted in it were directed to mastering the system of ready knowledge, methods of computation and designing. The classic model of engineering education with lecture as the leading form of teaching is intended for broadening of this only task. Knowledge in its traditional understanding as the aim of educational process loses its sense. Activity, the ability for its modification, personal qualities, defining not only especially professional characteristics of a person, but also the image of his life, level of his culture, intellectual development act as the aims of training.

² П.И.Пидкасистый, Л.М.Фридман, М.Г. Гарунов, Психолого-дидактический справочник преподавателя высшей школы, Педагогическое общество России, М. 1999.

It is evident that bringing these aims in this or that form in traditional educational process is unpromising. It is necessary to work out a new approach for constructing the didactic model of engineering education with qualitatively new management structure, with new system-forming factors. In this connection it is extremely important to reveal the capabilities on designing such a model, the dynamics of possible decisions' changing.

Earlier the main aim of higher school as a social institution was to form the system of students' knowledge and practical skills, which were necessary for the future professional activity of a narrow profile specialist. Now it is necessary to achieve upbringing, education and development of a specialist as a highly moral, socially mature, creatively active person, enterprising in hard conditions of market relations.

Scientists of different fields of knowledge – philosophers, psychologists, teachers, sociologists, economists, etc. turn their attention to education as a subject of study. Actual directions in modern theory of education are determined. To these directions, in particular, one can refer education as a process and the result of a person's interaction with the subsystems of culture; priority values, objectives and standards of educational process; planning and education management system, etc.

The analysis of modern pedagogical studies and the practice of home higher school are evidence of the increasing interest to the problem of education's quality being one of the most acute national problems. It is caused by the functional differentiation of administrative work, the changes in higher school organization structure, the education system decentralizing, etc. In these conditions the search of new approaches to the increasing of the effectiveness of organization and education systems' management, the orientation to the qualitative aspects and the educational system reforming on their basis are of great importance.

The increasing role of education in modern public life causes the necessity of deep studying of different factors having an influence on its functioning and development. Under the influence of socio-economic and political processes tasks, contents and organization of education have changed considerably. The basic directions in education of a new millennium are its humanization, humanitarization, democratization, computerizing, continuity and fundamentalization .

The modern condition of higher professional education, as well as the whole system of education in Russia, is estimated by many authors as a crisis. First of all the crisis of education is the crisis of a “person’s education” (L. Buyeva, T. Voronina, M. Mamardashvili, etc.), the other aspect is connected with the “deficit of culture in education” (V.P. Zinchenko), with the technocratic overload of education, its “humanitarian starvation” (E.D. Dneprov), the translation of knowledge in estrangement, impersonal form.

The humanitarization of education proposes the considerable increasing of time for disciplines of humanitarian cycle in the educational schedule. In other words, the humanitarization of education is developed in the logic of an educational subject³.

. But to be limited to the extensive way of this only problem’s solution, “slack humanitarization” is impossible (K. Yaspers). The style of relations “teacher – student” in this case does not undergo to any radical changes. It is necessary for the extensive way of humanitarization of education to be completed with the intensive one. We speak about the humanitarization of education not only in the logic of educational subject, but also in the logic of educational process. It is first of all the humanistic style of relations in higher school, humanitarization of educational environment in it and joining the culture as a picture of the world of human values and senses⁴.

The humanistic approach to the education means the admission of a person’s self-appraisal, his right for individual development, making conditions for creative self-implementation in the life activity system. The humanistic pedagogics assumes the radical rethinking of educational process, the components of which are:

- the development of the democratic style of relations between the teacher and a student;

³ Ю.В.Сенько, Гуманитарные основы педагогического образования: курс лекций, Учеб. Пособие „Академия”, М. 2000.

⁴ Ibidem.

- the changing of the way of students' thinking on the basis of their world's integrity understanding and the role of a person in its protection;
- the establishment of relations between students based on the norms of humanistic morals. The main aim of humanistic education in scientists' opinion is the forming of a creative person.

The necessity of the education system humanization is also evident. The Law of the Russian Federation "On Education" directly approves the humanistic ideas of education sphere reforming.

The modern behavioural aspect of management theory is directed to a man and social values. For the educational institution as a "human organization" it is extremely important. The humanization of management in higher school pedagogical process is the aim, condition and the result of higher school modification.

The higher school is an institution in which a student is formed and developed as a person in consequence of collective teachers' actions. So the pedagogical management should be directed to a person, have humanistic nature expressed in relations of cooperation on the basis of respect and confidence of a person. The higher the level of cooperation inside the management staff, between management and teachers is, the deeper and more stable the humanization of relations between teachers and students will be, the more effective the problem of a student's forming and developing as a person will be solved.

A person, his growth, development, education is the most valuable and important thing in the pedagogical process. Therefore, pedagogical management should be oriented to a person and have brightly expressed personal orientation. The main characteristics of humanistic management are the respect for a person, confidence to him, the integrated view on both the teacher and the student and the concentration of attention to the development of a creatively active person.

Giving the developing character to the pedagogical management in higher school demands deep and broad democratization of an administrative process, its decentralizing, autonomy, including teachers and students in management, organization of their collective thinking activity.

“New philosophy” of higher school requires the manager to change his view on his role and position in pedagogical management. It is the manager who constructs the integrity of pedagogical process; it is the person who makes conditions for the development of initiatives of each teacher and his potential. It is the management, which is directed to a person.

In the society structure education realizes the transmission of social values and scientific achievements and in this way stipulates for the nature and the range of their application in different spheres of people’s life. Socio-economic progress in its turn results in the considerable changing of the aim, tasks, functions, contents and organization of education [4].

The transition to the continuous education should overcome the orientation of traditional educational process to a surface contents’ “encyclopaedic”, to the overload with informative and factual material which is not connected with the students’ requests or the society’s needs. It is necessary to redirect the educational process from the reproduction of the models of the past experience of mankind only to mastering the ways of transforming the reality, acquiring the means and methods of self-education, study skills.

Education should be directed to the future, to such problem situations, solving of which assumes the usage of scientific knowledge as means of practical activity. So professional educational institutions of all levels should be redirected - from teaching the students to any particular trades “for the whole life” to giving them the opportunity first of all to get broad basic professional education.

The system forming factor of continuous education is its integrity that is not the mechanical increasing of its members, but the deep integration of all subsystems and the process of professional education.

The idea of continuous education, on the one hand, is the condition, and on the other – the most important social pedagogical principle which reflects the modern social tendencies of education’s construction as an integrated system. The continuous education as a pedagogical system is an integrated collection of means, ways, forms of acquiring, deepening and extension of basic education, professional competence, culture, and education of civil and moral maturity of a person.

Computer revolution has converted an intellectual occupation into the basis of other aspects of human activity. The transition to the post-industrial society puts rather complex problems for the Russian education. The reforming of home professional education should be adequate to the logic of computer revolution and the tendencies of market economics [5].

The Conception of computerizing of education sphere of the Russian Federation stresses that the purpose of education computerizing consists of:

- the global intellectual activity rationalization with the usage of new computer technologies;
- the radical improvement of the quality of specialists' training, with the new type of thinking which corresponds the requirements of the post-industrial society.

Today the sphere of education computerizing must change the educational process in higher school fundamentally, but it cannot be done without the reforming of the structure and contents of education⁵.

The application of computer technologies in pedagogical process is meaningful if it gives the additional capabilities and organization and engineering resources, helps to solve tactical tasks:

- access to the greater volume of educational information;
- figurative visual form of learning material representation;
- support of active methods of teaching in higher school pedagogical process;
- modular principle of educational material constructing;
- support of computer technology with the applicable scientific and methodical material⁶.

The main directions of the pedagogical process computerizing should be:

1. teaching processes computerizing;

⁵ Г.Р. Громов, Очерки информационной технологии, М. 1993.

⁶ Концепция информатизации сферы образования Российской Федерации. Проблемы информатизации высшей школы, Бюллетень 3-4 (13-14), М. 1998.

2. getting necessary (defined by the state educational standards) level of knowledge, skills in the field of general and professional “computer culture” by the students;
3. pedagogical process management computerizing;
4. computerizing of scientific studies and elaborations taking place in higher school;
5. equipment of higher schools with modern computer devices.

The realization of computer teaching is one of the main directions in perfecting the technologies of future specialist training, for creative and inventive activity of a person. The intensification of the future specialists training system to such an activity is impossible without the usage of means of computer technology. Such devices help to realize the qualitative progress in the development of scientific-creative activities of students. They allow:

- to extend the capabilities of accumulation and presentation of information for educational and research activity of the students considerably;
- to intensify the motivation of the teaching process and the participation in scientific and research work;
- to extend the capabilities to compound sets of tasks applied for educational and scientific activity of students;
- to change the control for the activity of students qualitatively, thus ensuring a control flexibility;
- to form the reflection of the students’ activity.

Recently, in connection with the intensive development of computer science, computer equipment and their active penetration into the sphere of education, we have to face with the especially informative approach to understanding the essence of educational process more often. Thus it is supposed that the educational process is something like a channel of transmission of information from the teacher, or even from an atomized complex, being a source of the educational information, to a student, listener being a customer of this information. The improvement of the quality of specialists’ training in higher school is largely defined by the achievements of computer science introduced in the educational process of higher school.

The facilities of computer science can be simultaneously used for joining the younger generation with computer culture that becomes actual especially in connection with the transition to a “computer society”. Under the forecasts of the scientists such a transition in Russia is planned in 2050, in the USA and Japan - in 2020, in the leading countries of Western Europe - in 2030.

Considerable changes take place in the contents of higher education, in conditions of the transition of the country to market economics.

Item 14 of the Law of the Russian Federation “On Education” points out, that the contents of education is “one of the factors of economic and social progress of society and must be oriented to ensuring the self-determination of a person, making conditions for his self-realization”⁷.

The government of Russia has approved the State standards of higher professional education. According to these standards the general requirements to the contents of higher education are established. On each direction and speciality the obligatory disciplines, which should be studied by each student are determined. The standard defines the general educational knowledge and skills any young specialist should have for receiving the corresponding qualification.

Specialists from the Russian Federation Ministry of Education consider that the defined standards and the disciplines’ system help to overcome a “one-side” in education, technocratic tendencies in specialists of a naturally-scientific and engineering profile training on the one hand, and on the other – the isolation of a person and making conditions for his (her) self-realization. They should train specialists not only of good professional level, but also capable to integrate and analyze the complex problems of modern society⁸.

Different conferences, symposiums on the indicated problems were held in Russia. It was pointed out that the higher school in Russia trained and trains specialists on naturally-scientific and engineering disciplines of “the

⁷ Закон Российской Федерации „Об образовании”, Изд-во „Ось 89”, М. 2001.

⁸ В.Г. Кинелев, Об итогах работы высшей школы в 1994 году и основных направлениях ее деятельности в 1995 г. в России, „Высшее образование” 1995 nr 1.

highest sample”. Also it was stressed that the engineering education in Russia with more than one century and a half history always ensured a high level of specialists’ training on many directions of engineering activity^{9 10}.

Various materials were also discussed: Memorandum of International Symposium of UNESCO “Fundamental (naturally-scientific and humanitarian) University Education” (October 17-19, 1994), “Appeal of the Participants of International Conference on Engineering Education” (May 22-25, 1995), “Concept of Naturally-Scientific Education: Purposes and Structure”; “Concept of Development of Higher Education in the Russian Federation”, “Conception of Open Engineering Education”, proposed by Management of scientific work of continuous education and low. The guidelines on perfecting the indicated directions of higher education were adopted.

As it is stressed in the indicated materials, one of the problems of a new stage of education development is the creation of premises for the liquidation of the arisen separations of naturally-scientific and humanitarian culture, their inter enriching and interpenetrating.

The ensuring perception of modern scientific culture of the world requires the innovations in the most important – the contents of education and its structure. Such scientific knowledge, disciplines and courses should first of all figure in the educational process, which “are capable:

- to reflect the fundamental moments of two-united process of integration and differentiation in science;
- to use the achievements of cybernetics, synergetics and other fields of knowledge originating from the joint of sciences and permitting to enter the system level of cognition;
- to see and use both the mechanisms of self-organizing and self-progressing of the phenomena and processes.

⁹ В.Г. Кинелев, Государственная политика развития высшего образования, „Высшее образование в России” 1993 nr 1.

¹⁰ В.Г. Кинелев, Проблемы инженерного образования в России, „Высшее образование в России” 1993 nr 2.

Disciplinary and interdisciplinary courses which express the most fundamental knowledge being the base for forming general and professional culture, quick adapting to new trades, specialities and specializations, theoretical basis for broad developing of applied researches and elaborations should play the prime role”¹¹.

The basic conceptions of the development of naturally-scientific and technical-engineering education in the system of higher professional education of Russia are directed to liquidate the following drawbacks and negative moments having place in higher education:

1. orientation of higher education towards socio-economic and production spheres on narrow directions of branches, the transition (beginning since 30s) to higher educational institutions of narrow profile, as a result of which specialities and specializations, educational schedules were designed, mastering them beginning with the first course chained the future specialist to a narrow profile of consequent professional activity;
2. specialists’ training on the indicated directions was oriented, basically, to the mean student, without taking into account the individual development, that did not allow in full measure to show potential educational-cognitive capacities of each person especially gifted and talented students;
3. underestimation of the role of fundamental sciences in work on the educational schedules, programs and text-books;
4. aspiration to join in the name of “the training of specialists for the whole life” with fundamental and professional education, that led to arising the real threat of liquidation of physics, chemistry and mechanics as independent disciplines in a number of higher schools; unreasoned interference in forming the course of mathematics threatening by losing the aspect of fundamental discipline.

To liquidate these drawbacks it was offered as follows.

¹¹ Материалы Международного симпозиума ЮНЕСКО „Фундаментальное (естественно-научное и гуманитарное) университетское образование”, „Высшее образование в России” 1994 nr 4.

- The enlargement of specialities in different directions of specialists' training.
- The changing of the position aside fundamentalization of naturally-scientific and engineering education, which would have larger time of survival and which would allow to pass from the education for the whole life to the long life education. Many lecturers of plenary meetings of the indicated forums – rector of Moscow State University V.A. Sadovnichy - at a seminar on naturally-scientific education, vice-president of the Russian Academy of Sciences K.V. Frolov - on conference on technical-engineering education stressed, that there can not be any prominent engineering and technological solution without fundamental knowledge ¹²¹³.
- The usage of modern programs and forms of teaching oriented to the most prepared and capable students should provide the training of highly qualified specialists necessary first of all for fundamental science, sphere of national economy, state administration and management in new socio-economic conditions.
- The rising of the level of students' motivation to the teaching at the basic stage, independent mastering the educational-professional programs of higher level of difficulty, active participation in scientific programs ¹⁴¹⁵.
- Mastering the methods of scientific studies, which are the foundation of the selected field of science, the continuous perfecting of scientific knowledge, principles of forming of tasks and the organization of scientific studies in the selected field.
- Getting professional knowledge supplying the competitiveness of master's degree in accordance with the international requirements to

¹² В.А.Садовничий, Роль университетов в формировании естественно-научного образования, „Высшее образование в России” 1993 nr 1.

¹³ К.В. Фролов, Техническое образование и социальный прогресс, „Высшее образование в России” 1993 nr 2.

¹⁴ Концепция развития высшего образования в Российской Федерации, „Высшее образование в России” 1993 nr 2.

¹⁵ Проблемы качества образования в России. Материалы Всероссийской научно-практической конференции, 22-27 мая 1997 года, Уфа, Москва 1997.

the specialists in the field of science, education and definite applied (practical) activity.

Among general requirements to the programs of magistracy, in contradistinction to bachelor put forward by the Eurasian association it is supposed to orient them to:

1. active independent work of a student, the development of skills of intensive independent activity in scientific labs, libraries, archives, independent work with definite parts (units) of educational courses and the whole course, etc.
2. free form of university education, by virtue of what the greatest possible “freedom of choice” of students to construct the contents of his teaching in accordance with his personal interests and inclinations on the basis of recommendations of teaching faculty or lab with which the scientific activity of the holder of master’s degree should be provided; and also laid claims to the holder of master’s degree from the future place of work;
3. introduction of the unit of specialities of professional training permitting to give additional specialization after graduating from the basic stage of university education ¹⁶.

The main principles of development of engineering education proposed by Association of Engineering Education on international conferences in Moscow are similar:

- providing with flexibility and dynamics of educational-professional programs renewing;
- realization of academic mobility, academic freedom in the sphere of higher education;
- using the modules in programs and educational disciplines;
- providing with balance of auditorium supply, consulting service and independent work of students;
- combination of fundamentalization, humanization, humanitarization and professional tendency of engineering education with emphasis on

¹⁶ Общая концепция университетской магистратуры, М., 1993.

the unification of the programs of the basic level and the programs of a higher (third) level personalizing;

- providing with combination of professional readiness, education and social - personal preparedness to the life and activity in a modern world (including living in conditions of the world market specialists' forming), etc.

Among the other basic ways of engineering education's fundamentalization they offer: the introduction of elect courses professionally oriented to the important meaning of fundamental disciplines; the optimization of inter-subject links; the broadening of scientific research work on the junction of professional and fundamental disciplines executed with the participation of students; the transferring of fundamental departments in the category of graduating ones.

Education is the constituents of social sphere of society therefore the main problems, ways, stages and tendencies of education development coincide on the whole with the general situation of society basically.

Thus, it is necessary to state, that in the nearest future the professional education in Russia should become completely different, be carried out at a new qualitative level. The ideas of humanitarization, humanization, democratization, fundamentalization, using computer and telecommunication facilities and computer educational technologies and continuity should form the basis of such education^{17 18}.

¹⁷ И. Н. Языкова, Генезис, эволюция и функционирование непрерывного образования, „Философия образования” 2006 nr 2, p. 39.

¹⁸ И. Н. Языкова, Управление педагогическим процессом в системе непрерывного технического образования., Ed. И. Н. Языкова, Рубцовский индустриальный институт, Рубцовск 2012, p. 252.