

## Training specialists in humanities at technical college

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### Abstract

This paper deals with the training of engineers, the role of the humanities in the course of vocational training in higher school. The authors conclude that a modern world of information requires a fairly high level of language training and the development of humanitarian thought, which is intended to arm a specialist not only with a certain amount of knowledge, but also to shape the qualities of educated person, a competent engineer. The authors in this paper examine the issue of professional competence, emphasizing fundamental importance of the teacher, who lays the foundations for this process. This paper gives a fairly clear idea of educational process management, ways of presenting new educational information. The paper reveals the role of the engineer in society, strategic objectives of humanitarian education are indicated concisely and clearly, as well as the attitudes and relations which it aims to build and develop for younger generation.

**Key words:** humanization, engineering personnel, professional training, method, education, competence, technology, training activities

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### Introduction

A unique role in preservation and enhancement of cultural resources belongs to education, particularly higher humanitarian in a modern rapidly changing world.

Democratization process and associated with it humanization of social relations and social structures set for theorists and practitioners, organizers and authorities of public education problems of humanization, strengthening humanistic trends in higher education. Now all the necessary conditions should be created in higher school for the formation of an intellectual that is a specialist equally possessing professional skills and foreign languages, as well as having a high level of culture (Vanyrihin, 2000).

Humanitarian education plays an important part in the student's personality, the future engineer development. The concept of "humanitarian" imbued with the immediate care of the person implies as its foundation, according to A.F. Losev, not just the sum of knowledge in the humanities, but also a special state of mind, a particular tune of mind - a strive for free-thinking (Stepanova, 2010) Humanitarian education forms the scientific world outlook, values orientation and students vital positions. It is the main core of all higher technical education humanization (Shimov, Romaeva, 1999).

The complex and contradictory nature of the processes taking place in Russian society, changing value orientations of youth, prestige lowering and the role of engineering activities while increasing the prestige of higher education, which enables the individual to be quite competitive in the shaping market economies, calls for changes in the content and methods of training engineering personnel, mostly focusing them on the formation of a specialist as a professional. In this connection there is a problem of optimal balance between fundamental components of education and training, the optimal content of their filling. Fundamental education is necessary for training of flexible and polymath scientific thinking, for effective ways of learning, for the holistic perception of the world, professional adaptation in rapidly

changing social and economic conditions should be focused on the solving of creative professional problems.

Globalization transforms education in one of the most important elements of the social infrastructure of developed countries. Socio-economic and technological transformations in the modern world raise difficult problems, and these problems are inevitably linked to the education institute functioning which is one of the ways to increase the competitiveness both the country as a whole and each person individually.

Formation of a new educational paradigm involves solving a number of major contradictions between the developing culture and traditional way of human formation, between the integrity of the culture and the principle of its presentation through a variety of subject areas in education. The traditional educational system is based on the transfer of existing knowledge, alienated from the dynamics of cultural development, alienated from the life of the individual and society. It does not take into account the growing need for continuous human development in the rapidly changing modern world.

The most important with regard to open education becomes humanization principle, which is directed of training to human and creating conditions for the development of creative individuality. Humanitarian component becomes the backbone of a new educational system, which, in turn, is transformed into a priority dominant factor of social development in the information society as a society of education, in which society's expectations are reflected in the field of education.

Global thinking, the ability to analyze a variety of information flows, a willingness to creative problem solving - this is the most important characteristics of a XXI century man. That is why the function of education in the modern era is much more complicated than a simple transfer of experience and knowledge from generation to generation. Humanization of higher education should contribute to the cognition of the human itself, including those posed by their reality, the principles of cognition. But such cognition is impossible without substantial polylogue of all humanities in educational process.

A humanitarian much easier perceives and interprets the fundamentally new form of description of the world, because his mind is already prepared for a meeting with other, alternative ways of describing reality (Colin, 2002). The social and humanitarian education advocates a kind of intermediary between the present and future developments of the past culture, reconciling them to the level of reflexive attitude towards the possibility of productive dialogue of times (Laptev, 1991). Humanization of technical education is one of the leading strategies for the renewal of higher education. Its main task is to give common to all mankind nature to training of profession. The role of higher education in the formation of professional culture, development and improvement of the future specialist should be considered in the context of the current state of the education system and social and economic development of society (Yagodin, 1989, Kotelnikov, 1998).

## **Methodology**

Social needs of innovative and dynamic society necessitate a reorientation of higher education to a productive learning activities based on the interaction of all training subjects. A specialist in modern production conditions requires such individual professional qualities as the ability to make independent and responsible decisions, awareness and self-determination of performance targets, the ability to actively interact with the environment, etc. Such qualities are formed in the course of vocational training in higher school, including with the help of humanities (Underbill, 1989).

It is the teacher of the higher school who lays the foundation of professional competence which is the result of professional education that includes both the content of training and a system of non-professional knowledge required to a specialist (Glukachev, 1999).

We mean a professional competence as the ability of future specialist to make his own responsible decisions in specific situations during professional activities. It requires a creative approach to business. This ability a future specialist should learn in higher school, that is, he must master not only the necessary amount of knowledge but also the methods of non-standard problem solutions every time in a new social environment. Thus, the process of professional training in higher school is the formation of its professional identity (Samoilov, 2002). Formation of professional competence of the future specialist cannot be solved outside the concept of the individual. Therefore, new education models are required now which are oriented on the development of personality, the formation of motives and needs of the person in a task-oriented self-improvement. At the same time, we must pursue the idea that the specialist is not only a person with humanitarian and professional education, but also an active, tolerant, capable performer in a professional team and in the social sphere (Fokin, 2002).

Personality formation occurs in the training activities. It seems to us that a teacher of any discipline presenting new training information should take into account the following points:

- Student's willingness to understand presented information, i.e., a teacher should take into account the level of knowledge and skills of students;
- A teacher must find moments in new information that would require from a student "an involvement in the work" of related disciplines information;
- To consider, if possible, every new topic in the social aspect from the attitude of the citizen;
- To build a training process with a focus on acmeological aspects of personality development.

A human is a social phenomenon. Therefore, a future specialist should be involved in the social sphere of life as soon as possible where he could perform a specific social function, since through active participation in the social sphere of life a person's social significance acquires a personal meaning.

A person in some socially significant situation gets an opportunity to comprehend the world, its place in it both as a person and as a future specialist. In this situation, there is self-realization of personality, allowing a person to assess human and professional qualities, to assess his abilities and opportunities to understand the importance of his future profession in the world of things and events.

The Russian economy reforming problems are possible for the specialists who know modern equipment and technology, having creative thinking and the ability to invent. The modern engineer is both a good industrialist and a specialist who understands the economic, environmental, social and other problems of society. He must have scientific and technical erudition, the striving for continuous development of his professional interests, critical approach to finding constructive solutions to the problems, the ability to work with people.

In any sphere of activity a real engineer must act independently, creatively and with initiative. These necessary qualities are not only the result of training and education at the college, but also the result of the accumulated practical skills in solving problems in the course of professional activity (Grebnev, 2003).

One of the main engineer's competences is the ability to adapt to the rapidly increasing demands in the field of new software, modern engineering and the latest technologies.

An important element of the solution to these problems is a qualifying humanitarian education of technical college graduates.

A high level of language training is necessary for the effective activity in the modern world of information (Shiyarov, 1991).

## Results

A technical college is the main element in the system of higher technical education. An engineer is a creative person, but the current state of society in which the priority of scientific technical work and creativity is unnoticeable, creates a contradiction between the increasing demands for training and subjective decrease in the engineering profession motivation choice. An engineer is a person with the higher technical education who should combine special knowledge with socio-psychological competence and intellectual culture. Training in a technical college is carried on considering the specifics of the engineering functions: rational and efficient use of the existing equipment and technologies, new technologies development, new equipment designing. Therefore training in a technical college takes into account the major changes taking place in science, technology, economics and organization of production.

It is aimed at training professionals in the creative, independent activity, the ability to improve their education continuously, to be competent in Scientific and Technical Center (STC). The higher education peculiarity in a technical college is not only the development of fundamental scientific knowledge, general engineering and special disciplines, but also the technical kind of thinking formation inherent in the engineering field activities and engineering thinking.

To develop the engineering thinking a future professional needs “the ability to carry out mental experiments, combining different sensory images on the basis of some original concept, creative imagination and intuitive knowledge elements - all this becomes a necessary component of the future engineer technical thinking creation”.

High technical school education is associated with the well-known peculiarity of educational process organization traditional forms: build up methods of lectures, seminars and workshops, training and research work of students, field and pre-diploma practice. It also forms the engineering thinking.

Training at technical college is characterized by the development of humanitarian thinking. Under new conditions of education development the issue of strengthening humanitarian training is of particular relevance, since “no other sciences can be compared with the humanitarian training for the relevance and effectiveness in the human culture formation and moral education. We don't have to carry out computerization at the expense of the humanities for the latter does not give good seedlings without human knowledge”.

Many scientists consider that “the higher technical school humanization (i.e. the technical education orientation is not only directed towards the technical sciences but also to the humanities) is important for the development and improvement of technical specialists thinking, not only in connection with association enrichment in solving technical and technological problems, it is also important to realize that any engineering development work is done, ultimately for humans; it should help to increase the “human” in the life of the user, implemented on this basis”.

Thus, from the above it is clear how important are comparative studies in the field of humanitarian education nowadays, designed to provide a specialist not only with a certain amount of knowledge, but also to develop qualities of a civilized man and a competent engineer.

This position is confirmed by the practice of foreign scientific and technical higher school, first of all, the US, where proportion of the humanities in the curriculum is constantly growing, reaching almost 30% in recent years.

### **Main part (discussions)**

Most scientists agree that the new concept of education must be linked to its humanization. It must due to the fact that the man is a self-developing system and higher education should promote the self-development of a human. A human is an open system and requires a deep study of his relations with the social world, an impact of the world and national cultures achievements exposed to him. A human is a biopsychosocial creature, and we should take into account the genetic code impact on him, the nature character of the mind and its development, and finally, the impact of the environment, primarily social (Yelmanova, 1989).

Modern society development conditions put new challenges for higher education, that is, to prepare specialists, meeting the changing needs of society. Now young professionals should have more professional mobility than yesterday which requires a fairly high level of intellectual activity. This is due to the peculiarities of the new socio-economic conditions and the intensification of scientific and technical progress. An engineer is a person with higher technical education who must combine specialized knowledge with social and psychological competence and intellectual culture (Barannikov, 1989). The training in a technical college is organized according to engineering functions specifics (rational and efficient use of the existing equipment and technologies, development of new technologies, new equipment designing), so the training in a technical college takes into account the major changes taking place in science, technology, economics and production management. It is aimed at training professionals for the creative, independent activity, for the abilities to improve their education all the time, to be competent in scientific and technological progress achievements, to provide conditions for self-determination and self-realization. This statement is based on the change in relation to the person as a complex system and to the knowledge that should be turned to the future, not to the past. The anticipatory reflection of "cognition of the future" degree becomes the criterion for the new educational model implementation. The student becomes the subject of cognitive activity and not the pedagogical influence object in the new educational paradigm. The dialogue between a teacher and a student determines the basic forms of educational process. The result is an active, creative activity of students, far from being simple reproduction.

Russia's transition to market relations in the sphere of economy and production demanded a rethinking of public policy in the field of education. It became apparent that the traditional system of technical education in the current socio-economic environment does not provide implementation of the social order in the field of professional training does not satisfy the needs of the individual in obtaining the required education.

The graduates of technical colleges have the depth and width of knowledge, but in practice do not show flexibility, agility, variability of solutions, they are poorly developed in the future prospects vision, and the reaction to changes in the specific situation. In terms of adaptation to a market economy and fierce competition in the educational services field the universities faced the challenge - to educate professionals, whose quality of training would satisfy the consumers in the labor market. Results of foreign and domestic studies suggest that the market is often unable to predict what specialists it will need. Therefore, the modern specialist, along with fundamental training must have a general cultural development level.

The competitiveness of the modern expert depends not only on student's future profession mastery, but also on his versatile humanitarian culture, creative

thinking and good education. The higher education specifics in technical colleges should be not only the development of fundamental scientific knowledge, general engineering and special disciplines, but also the technical and engineering way of thinking formation inherent in the engineering field activities (Novikova, 1993).

For the future specialist engineering thinking skills development it is necessary to conduct mental experiments, combining different sensory images on the basis of the original concept. That is why the development of new education environment, the question of strengthening humanitarian training is of particular relevance, since no exact sciences can compete with humanitarian training in relevance and effectiveness in the formation of human culture, its moral education. Along with engineering and humanitarian training in a technical college the higher education should set the task of formation the individuality strive for self-realization.

Higher technical education should not only orient the students to prepare for work in the conditions of modern technology, but also to promote them to a new level of culture corresponding to these technologies. Y.G. Fokin expressed a similar point of view: "Despite the technical profile profession, the university graduate of the XXI century must be, above all, the culture subject, the bearer of high moral and social activity".

A specialist-engineer must be surely a carrier of culture, be able to evaluate from the professional culture point of view the universal implications of any changes in the field of technology. This is due to one of the aspects of the education humanization - the identification of technical culture of humanitarian conditionality. Indeed, today, scientists and engineers are constantly finding out that their activity is not impersonal for society, the man and nature, that it not only creates wealth and brings progress, but it also destroys nature, mechanizes society corrupts the spirit (Laptev, 1991). Therefore, education in engineering involves the analysis of crisis situations created by engineering analysis of the negative effects (for nature, society and human) technical activities, starting with the scientific study, and ending in the industrial production, involves the analysis of values, world views, ideas that determine the activities and different mass errors of a scientist, an engineer, a designer, and a technologist. There is really need to refer to a number of humanitarian sciences, but not at all out of context, as is happening now but namely for a scientist or an engineer to clarify the negative consequences of his activities for the person or the nature, the reasons that lead to the typical mistakes, anti-humanitarian nature of technical activities.

This article is based on the results of a sociological survey conducted in 2010 and 2015 according to the plan of the Ministry of Education on the basis of Naberezhnye Chelny Institute of Kazan Federal (Volga region) University. It had two interconnected parts: fundamental-theoretical and scientific-applied and it was carried out in two directions - the intelligence and analytical. Universities and The Ministry of Education archives and current records, legislation were studied, about 100 individual and group interviews with senior officials and leading scientists of universities, managers of industrial enterprises, the students and young engineers were carried out. The survey for the three profiles (questionnaires) covered 800 students, 300 professors and lecturers, 100 engineers.

The research object is an Automobiles Division, Power Engineering and IT Development Division, Civil Engineering Division in Naberezhnye Chelny Institute of Kazan Federal (Volga region) University: the problem of the technical college graduates training level was studied at KAMAZ industrial enterprises. The research showed that the students understand the growing importance and role of the humanitarian sciences in training. The traditional underestimation of the social sciences in technical colleges is gradually giving way to a more thoughtful approach. According to the study in 2015, 57% of the 800 students surveyed believed that the

humanitarian sciences are promoting to understand the surrounding reality, themselves and others. In 2010, the proportion of such responses was 31%. More than half of the respondents noted the positive role of these sciences in the development of skills for independent thinking (in 2010 - only 29%). 37% of students positively evaluated the role of these sciences in the enrichment of the political, moral, aesthetic culture of the individual. It should be noted that the 4th year students finishing the studies and who were able to sum up the results of study in high school more adequately gave the highest evaluation of the humanities for the overall development and ability to understand in the surrounding reality. The polls in 2015 showed the students increased attendance of lectures in the humanities: regularly visit 72% of the respondents; occasionally - 25.4%; do not go to - 2.8%. These data are significantly higher than those that were received in 2010. One of the students' increased rates interest in humanitarian sciences, especially in the social ones, were the answers to the question: "What is your favorite subject?". Positive responses on individual social sciences accounted for more than 30%, including on the economy - 32%. At the same time among the favorite subjects of the special profiling of science did not occupy the leading position, as it was 5-10 years ago, they received less approval than humanitarian sciences. However, students expressed criticisms on the teaching of social sciences. The lectures quality assessments were the following: high - 27%; average - 57%; low - 16%. Many respondents noted the lack of active teaching methods uses; 36% believed that the lecture content coincided with the textbook; only 30% believed that the lecture course was of problematic nature. More than half of the students mentioned the seminars on the simplified method "question - answer".

In general, the students evaluated negatively prevailing at many departments humanitarian subjects teaching methods based on information and extensive model of learning. Although it provides a wealth of knowledge, but doesn't promote to the development of students' independent theoretical thinking leads to an uncritical, dogmatic perception of the material that is fundamentally contrary to the objectives of the humanization of the educational process. In the study of humanitarian training level in higher education, we were not limited to the survey of students of different courses and added it to determine the views of 500 young professionals who graduated from a higher school institution 1-2 years ago. The survey showed that it was humanitarian knowledge and ability to apply it in practice that young engineers particularly lacked for the work with the high level of humanitarian training and preparation (both theoretical and, in particular, the applied one). About a quarter of respondents mentioned and admitted the lack of economic knowledge. But the creation and implementation of innovative tools, materials and technical processes requires primarily developing techniques and technology economic grounding to ensure high productivity and minimum cost.

A growing significance of the human factor in the production process due to the humanization of production requires considerable engineer mental training. Meanwhile, the psychology course, due to obvious underestimation, is declared optional and actually read in a few universities (if it is taught, it is usually separated from practice, there is no emphasis on engineering psychology and ergonomics). Psychological knowledge is particularly important in the automated systems operations that require taking into account the behavior, management and staff performance and tiredness in various conditions and modes. There is lack of knowledge of 97 young specialists about inner "I", of the spiritual world, the features of nature that contribute to self-development and self-realization. The graduates often lack the organizational skills, flexibility elementary behavior, which should be based on knowledge in the field of psychology, sociology, management. Young professionals are often helpless in dealing with the interaction between the man and technology, few of them is aware of the labor scientific organization. Many young

engineers don't know the principles of communication with the workers, engineers, managers they are not familiar with the system of motivation and motives in team activities, personal goals and interpersonal relationships. But some of them are appointed to managerial positions in the workplace during the first years of working activities. Hence there is a need for a sound psychological and sociological training of students, the formation of social and psychological qualities needed for employment, providing a clear vision of the social consequences and conditions applied to the technical and administrative decisions. In practice young professionals with difficulty realize the principles of industrial design and engineering ethics, which they did not study in higher schools, for ethics and aesthetics are considered and taught as elective disciplines. The present day life, however, urgently requires mastering them and applying in practice. With regard to the course of sociology, it is traditionally taught often in universities purely academically. Therefore, a young professional, having taken this course, even with a high score, cannot organize the sociological research at work, create a profile and hold a public opinion survey, as he didn't study it.

All this indicates a lack of profiling the social sciences teaching, which hampers the qualified engineer preparation. In an interview with the Technical Sciences teachers there were opinions that the teaching of the humanities, divorced from the university profile is not efficient enough. This is confirmed by our research data: only 5% of the students surveyed believe that, for example, philosophy, sociology, economics and other humanitarian sciences facilitate the study of the special sciences, their methods learning. The lack of a full-fledged humanitarian training is one of the main reasons of low level scientific, technical and engineering thinking of young professionals, who, by their own admission, are proficient in high or sufficiently only 52%. This evidence is directly reflected in the level, innovative activities scope, which only 14% of young engineers tend to. These data suggest the gap between training and education, theory and practice. The social and political practice, which is one of the sections of industrial practice promoted to the deficiencies overcoming noted in the past. In our opinion, it is, unreasonably abolished in recent years. The department of Social Sciences, previously in charge of this practice is away from any involvement in its organizing.

## **Conclusion**

Having analyzed the results of our research we came to the following conclusion: the humanitarian cycle structure and the content of the subjects taught needs further improvement. Thus, the ethics and aesthetics courses should be considered obligatory. It should be the introduction of Psychology at the profile level. It is advisable to distinguish the main departments for humanitarian specialties to perform coordination functions of the teachers' methodological and theoretical seminars. It remains relevant to the preparation and retraining of teachers in the humanities in view of new tasks. The humanitarian education potential requires further development and improvement.

So, we can state that the training and education specifics in a technical college is in such problems decision making as: the students' respect development for their future professional activity, the responsibility for the further development of scientific and technological progress; the personality of a specialist engineer with high universal, aesthetic, professional skills, wide communicative and adaptive capabilities by increasing the significance of the humanitarian and socio-economic training; constant adjustment students' behaviors, taking into account the socio-economic development and national mentality peculiarities.



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