

Essence and Contents Project-Technological Pedagogue's Culture

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Abstract: The new task of preparing students for work in the conditions of the post-industrial information society, in the conditions of electronic (design and technology), human culture and society are possible only of the individual formed of engineering and technological culture presence. In the study on the basis of theoretical and empirical studies approaches of design and technological culture definition as an important component of teacher training were analyzed. The researchers "design and technology teacher culture" concept interpretation as a dynamic elements aggregate that combine knowledge, skills, motivation, values, personality traits which are necessary for effective transformational acquisition activity.

Key words: Design-technological culture of the teacher, actualization, essence, conceptual ideas, content, components, functions

INTRODUCTION

The modern world is characterized as "the world changes" which required an appropriate person himself having highly educated and capable scientific master the realities of the world, through continuous self-improvement, self-education, self-development taking into account the increasing dynamics of changes in the socio-cultural and political spheres, the economy and science, in the relationship with nature.

There is a production technologies, new scientific knowledge, amplified upgrade, the complex scientific and theoretical problems of interdisciplinary nature growth in connection with the society's specialist preparation demands increased and the high schools, respectively, the competitive specialists who are ready to innovate in terms constant creative research preparation task, complex systems processing and information data interpretation that may be formed only in the presence of the individual design and technological culture.

The research purpose: The actualization factors to analyze, the phenomenon essence to reveal, conceptual ideas and identify possible content design and technology teachers' culture implementation models in the modern university conditions.

Material and research methods: The socio-philosophical, psychological and pedagogical, scientific-methodological and technical literature analysis, the system-structural, theoretical and methodological analysis of the problem.

The research results and discussion: The problem of creating a modern, competitive and in demand teacher training system in the past decade became especially acute under the influence of education field developments in its civilization role, economic and social development in our country and the world in general. Among the most significant pedagogues training system actualization factors and the design and technology teacher culture formation may include:

- The role of the general basic educational training strengthening future self-education and professional adaptation potential providing
- The education, science and industry (cooperative education) integration
- Strengthening the education role as an integral capital flow ("hot" qualitative economies with the highest level of demand of education and science) in economic development
- The establishment of lifelong education system (Krylov, 2015; Komelina *et al.*, 2016; Khairullina *et al.*, 2014)

In order to characterize the information technology society current state put into circulation and the "technological world" term is actively used. In order to live in this world successfully and be able to influence its development, citizens should be well informed and prepared and that the technology has become a philosophy of action, students should be able to design its activities and technologically competent to implement it that is have a high level of design and technological

culture. Properly prepared pedagogue will be able to implement effective management of design and engineering students' activities. The design and technological culture phenomenon is beginning to attract the attention of many researchers and has become one of the important components of the modern educational process. However, the "design and technological culture" of the pedagogues' concept essence not formed so far, its components not defined the theoretical and methodological conditions of formation and the like are not justified. On the pedagogues' development issues design and technological culture in the theoretical and methodological studies is not covered properly, although other pedagogues' professional activity and the culture components (design, technological, technical, graphics, information, etc.) have been studied quite extensively.

LITERATURE REVIEW

The teachers' nature of design and technology culture the following major categories to determine: culture, a project, designing, technology, technological culture it is necessary to characterize.

Let's consider more detail of "culture", "project culture" concepts nature as the categories which are the basis of project activity of the future pedagogue. The philosophical, psychological and pedagogical, cultural and historical literature analysis shows that the first theoretical understanding of culture refers to the spiritual heritage of modern times, when it, finding the independent concept value becomes the object of philosophical and theoretical interest. E. Taylor gave one of the first culture's anthropological interpretation, defining it as a body of knowledge, art, morals, law, customs and other features inherent in man as a member of society, at the same time believing that the historical religions have their origin from the idea of the soul. In a philosophical sense, "culture" is defined as a way of an individual's life as well as people's consciousness behavior and activities feature in specific areas of public life.

According to Kagan, culture formed by human activity is characterized by the following components: the individual's quality including himself as a creator and accessory creations; ways of working, inventive man perfected and passed down from generation to generation through the process of training and education; diversity of material, spiritual, artistic objects which objectified processes activities that make up the cultural environment; secondary methods of activity, serving to disobjectification human qualities that are stored in the object being culture. Hence, a person having the appropriate personality traits and ways of activities

creates a culture (material and spiritual) objectified her but disobjectified it develops and forms itself as the bearer of a higher individual culture.

In turn the socio-economic practices analysis allows us to conclude that, in spite of the different culture components (artistic, economic, legal, environmental, information, design, technology, etc.) composition dominated by one or another at every social development universal culture stage. So, the first universal culture- mythology explaining the world on the basis of direct observations was inherent to ancient civilizations. The second universal culture-cosmological was characterized by the natural factor public consciousness predominance, in which a person was seen as a contemplative place in nature and society events. The third universal culture- anthropology was characterized by personality role predominance, considered as a researcher and creator of the new. Industrial society is characterized by rationalism, where every branch of science acts rationally-organized system with its original principles with the division of the knowledge contents to the original, fundamental and derivative its division into portions followed by their hierarchy.

In summary, it can be noted that the leading trend of modern culture deep integration of: science (opening at the junction of various sciences, interdisciplinary research, etc.); manufacturing (high technology, information nanobiotechnology, etc.); art (cinema, theater, television, exhibitions, etc.); life style (fashion, behavior, pace of life, etc).

For centuries, of mankind development through certain varieties of organization activity basic forms (types of organizational culture): the traditional, corporate-craft, professional (scientific) present postindustrial (information) society is defined as a design and technological type of organizational culture. If you move the social development of the pupils' labor preparation process it can be seen that in the course of ontogenesis are under the pedagogue direction consistently master the ways of working that are typical for the type of organizational culture and implemented through appropriate labor training systems: traditional (subjective), craft (operating), professional (operational and subjective, operational and integrated) and design process (design, technology, design and technology). Because each type of society's organizational culture necessarily reflected through the education system the design and technological culture need to be considered as a condition and the result of its effective economic and social development at the same time.

In general, the "culture" concept (from the Latin-*colere, cultura*) during its operation in the ancient

world had many different meanings: “cultivation”, “splice”, “care”, “processing”, “improvement”, “creation”, “formation” and others. Now the identity of its use in the scientific practice is impossible except in relation of man concept can be interpreted as the cultivation, the formation, the improvement of its image. Culture in its various manifestations is the object and subject of study of many sciences so now account for almost 300 of its definitions. In this study, we use two main areas of culture interpretation often present in the scientific literature:

- The totality of material and spiritual values which are created by man in the course of his life
- A form of human self-realization in all its diversity a way of being human

These definitions we consider optimal, since both design and technological types of crops that are the basis of design and technological culture, closely connected with the creation of material and spiritual values and opportunities of pedagogues’ self-realization in the course of their productive activities. The students design culture, in our opinion, reflects creativity, makes its design and technological culture and is formed in the design process. The term “project” is of Latin origin (verb *proicere* or *projicere*, *communio projectus*) and literally means “thrown ahead”, “speaker”, “naked” or such that the “striking”. Abroad (in particular, in the UK), there are interpretations of the term:) design (from English design) a documented plan of the building or structure;) project (from English project) the system set out in the framework of its purposes (or to be re-modernization) for the implementation of physical objects, technological projects, processes and the like. Based on these project definitions, it can be argued that the project it is mental activity determines the future process and the reality transformation result based on the natural and social laws, on the basis of selection and decision-making. It is important in projecting to emphasize his perfect character; actions are carried out not with real phenomena or processes and their imaginary models.

It is also worth noting that the project of which is traditionally carried out in the technical areas of expertise to the middle of the 20th century, it was transformed and became widespread in the humanitarian sphere: There were organizational, design, economic, professional, ecological, pedagogical and other types of social project. In the context of the teacher’s design culture development we allocate engineering, pedagogical and design projecting. Engineering projecting is traditionally considered a preparatory stage of production activity and

is intended to solve urgent technical problem which is based on the invention. The project contents are determined by the value orientations; In the projecting process is modeled by a particular object of reality.

Jones (1986) considers projecting as a mental activity associated with the production of ideas. In his opinion, the projecting purpose-to initiate human changes in the artificial environment. The natural environment can’t be projecting because it is an objective reality from a scientific, materialistic point of view: everything it touches the human hand in the process of purposeful activity it is an artificial environment. Projecting is a mental change in this environment. Hill (1973) projecting process considers the wider, combining it with creative and transforming activity in the material sphere (in the design involved the technological aspect).

The scientific and educational literature analysis shows that scientists that deal with the problems of engineering project different interpretations of the process. However, most of them are inclined to think that the project is a special kind of mental activity aimed at the creation of a mental or artificial transformation of the environment. Pedagogical projecting is a type of modern pedagogical activity developed over the past decade. Since, it has technical roots in all its pedagogical field characteristics are typically stored to procedures carried out can be identified as the projecting.

There are different visions of functions and the methodology of pedagogical projecting. Most often it is interpreted as the direction of social engineering aimed at creating and modifying processes organized education, upbringing and training. Thus, Zair-Beck (1994) notes that the projecting is always associated with the study of the essence of pedagogical regularities, psychological characteristics of the individual, targeted development of interoperability so the pedagogical design must be understood as a specially organized comprehension of pedagogical projects and systems.

Design projecting is a special kind of creative activity associated with the development of a design object on the principle of constructive functionality+constructiveness+ beauty combining scientific and intuitive foresight and requires continuous development of project capabilities. At the heart of the design projecting is the design artistic implying the nomination of a new artistic-projection and design ideas and the conditions for its rational realization. A generalized representation of the design makes it possible to develop a common (universal) methodology which can be effectively used in engineering, pedagogical and art education. In this context, in a logical structure design is convenient to define the following stages: formulation of the problem→information collection→data

analysis→selection strategy→choice of tactics→wording ideas→options compare→synthesis of proposed solutions→their evaluation→selection of optimal solutions→its concretization.

The main projecting functions that are crucial in formation of the pedagogue's project culture is a motivational, organizational, communication, prognostic, coordinating, evaluation, control and correction and management. We add to it as the function awareness responsibility of its activities results. Defining the essence of the different projecting types, their functions and stages of implementation make it possible to approach the definition of the concept of "project culture" which is the most common interpretation of project culture is seen as the highest form of professional competence of the expert in the field of projecting; knowledge and skills of projecting and implementing the best ideas.

M.M. Akhmetova says that the project culture is for the teacher of his professional and pedagogical culture a set of "project" innovative ways to transform teaching reality-based forecasting, planning, design and simulation of educational and upbringing phenomena, processes and systems.

In a similar position N. Y. Pakhomova defines culture as a pedagogue's characteristics pedagogical design which indicates its ability to organize and implement the project technology. N.V. Topilina, in turn, uses the term "project culture", defining it from pedagogical design position as "integration socio-cultural phenomenon is objectified in pedagogical practice, the level of development of teacher's methodological culture". Matyash (2002) believes that project culture substance use in professional work collectively project ways to transform reality (nature, society, human) in combination of the normative content of the meaning and value. Gennesaretskaya and Sidorenko suitable for the design culture in the context of art activity, considering it a higher level of design sphere which is built on the current design conversion process and (or) the reproduction environment. According to Chenobitov and Kovalenko, the concept of "project culture" is an integral; this culture can be defined as "socially progressive, the educational process subjects creative activity in all areas accessible to them being and consciousness".

Usher and Shekhovtseva believe that the project culture a quality characteristic, a certain level of development of the system and the project of thinking, worldview, perception and understanding of reality; it reflects the creativity of man (a group of people, society as a whole), achieved as a result of the development of theoretical knowledge and practical skills in a particular activity, allowing to improve and create new objects,

objects, technologies, processes to meet the growing material and spiritual, informational and other people needs as well as the degree of development of systems of ethical and legal norms, values, attitudes, related to technical, social and computer-aided projecting. Some of the characteristics of the design culture of overly generalized and narrowed (Khairullina, 2005), others expanded (Krylov, 2015) that does not contribute to a clear and unambiguous definition of its features.

Most of all, in our opinion, the project culture essence corresponds to Lavrov (2008) definition, who believes that pedagogue's project culture, being a professional and pedagogical culture, it is the system as a pedagogue identity which is determined by skills development and implementation of technological, pedagogical and personally significant projects on the basis of accumulated knowledge and skills in the process of training and project activity. This definition is confirmed by the opinion Sidorenko (2010) that the project is based on the culture of the pedagogue:

- The project competence which contains the substantive knowledge and skills and relevant knowledge and skills related to the projecting of learning activities in the study of a particular subject
- With respect to the humanistic educational environment that requires creativity in reform efforts aimed at its optimization and humanistic organization
- Formation of the creative qualities and abilities of the individual the ability to design their own technological approaches to solving problems in rapidly changing non-standard situations

Summarizing the presented definitions, we describe of the pedagogue project culture as an integrative property of the person which is realizes actively itself in individual or collective project activities and is a prerequisite for effective professional pedagogue development. Another component of the project and technology pedagogue culture is a technological culture that defines its technological aspect. This approach is based on the fact that an essential feature of all industrial and social (pedagogical and design) processes is their technologization-strict observance of relevant content and sequence of stages of practical implementation of the projects, i.e., the use of certain technologies.

The concept of "technology" (from greek-techne, i.e., art, craftsmanship and logos-word, teaching, science) as a science about the art arose in connection with technical progress. Most of all it is connected with the production process; technology in this sense is defined as the

totality of the processing methods producing changes state, properties, shape of raw materials in the production process. Technology as the task of science is to find out the physical, chemical, mechanical and other laws in order to identify and use in practice the most efficient production processes. In connection with the penetration of technology in different (even the “non-technological”) regarding the knowledge of definitions, there are a few dozen. We will focus only on those that reflect the specific creative transforming activity of the future labor training pedagogue. For this reason, we take the technology as a means of human exploration of the built environment through specially organized activities. This activity includes the following components: information (methodological bases, scientific principles), material (tools and objects of labor), functional (algorithm implementation) social (public demand for labor), personal (level of professional competence). Leading in any technology is considered to be specific definition of the final result and predicted his achievement. The prerequisites for the application of technological processes in the industrial and social spheres (pedagogy and design) is their planning, programming, outlined the final properties of the proposed product, the means of their creation, purposeful modeling the conditions of their implementation as well as the actual functioning of these processes. The problem technologizing industrial, educational, artistic processes in recent years transformed into a need for the development of technological competence and technological culture of the perpetrators.

The pedagogue’s technological culture formation urgency in the contemporary socio-economic conditions is based on the understanding of all members of the information society values the impact of different technologies on the individual his professional growth, welfare and so on. Komelina *et al.* (2016), Krylov (2015), Lavrentiev *et al.* (2015), Matyash (2002), Simonenko (2005) and Zair-Bek (1994) and others define a technological culture in the broadest social sense as the level of development of society on the basis of appropriate and effective reform activities of people expressed a set of technologies achieved in the material and spiritual world; in a narrow personal sense, they interpret it as a mastery of modern methods of human knowledge and transform themselves and the world. D.G. Lewites, G.E. Muraviev, N.E. Shurova, considering the pedagogical aspect of pedagogue technological culture, treat it as a special characteristic of the individual, which contains its technological capabilities and needs.

Simonenko (2005) considers the technological culture in social and personal plans: socially technological culture is the society’s level of development on the basis of

appropriate and effective transformational human activity, set of technology achieved in the production of material and spiritual; in a personal sense technological culture is the level of men mastery of modern learning methods and transformation of ourselves and the world ready for this transformation.

P.R. Atutov was given to the technological culture concept as an important sphere of common human culture, reflecting at every historical stage of its development goals, the nature and level of transforming the people’s creative activity, carried out on the basis of scientific and technological achievements of industrial relations.

The analysis of scientific literature has shown that the concept of “technological culture” is not an established definition. The main reason for this ambiguity is the ambiguity of the term itself basic terms “technology” and “culture”. Technological culture is one of the components of a common culture. It is closely connected to the converter (practical and projection) human activities.

EMPIRICAL RESULTS

In summary, from the perspective of cultural studies a technological culture we understand the man and society transformational activity development level, expressed in the aggregate reached technologies material and spiritual production as well as in the level of mastery of human ways of knowing ourselves and the world, allowing it to participate in modern processes and ensuring harmonious interaction of man, nature and technology environment, that is their humane partnership.

The analyzed approaches to the project and technological culture, reflected in the publications of domestic and foreign scientists, suggest the possibility that the design and technology teacher culture should be based on:

- Project and technological students’ competence which are formed on the respective knowledge and skills
- A creative attitude to the content and structure of labor training involves activity in the creative and transformative activities aimed at its optimization and efficient organization
- The ability to design their own technological approaches to the implementation of educational, artistic and engineering problems in dynamically changing unusual situations and transform in accordance with the information environment requirements

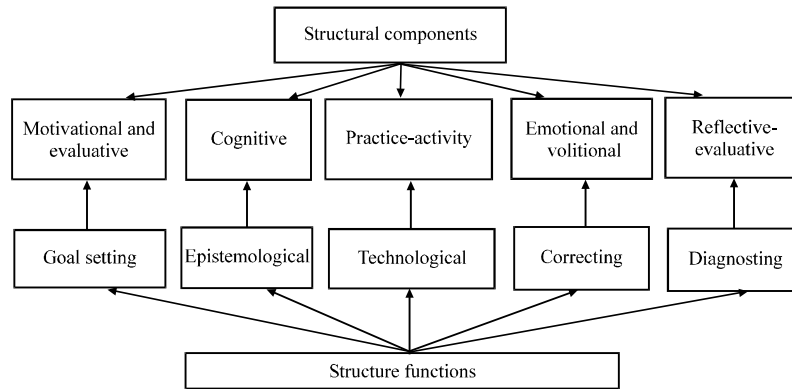


Fig. 1: Structure project and technology pedagogy culture

From this perspective, we can assume that a wide interpretation of pedagogue’s project and technology culture is an integral quality education and provides for: a set of professional competencies which correspond to the modern level of development of the society; the features of projecting and construction development and psychological readiness of innovative approaches for their implementation; the ability to creatively solve the engineering and technological problems; able to operate in non-standard working conditions of the process of preparation and the ability to transform them; the ability to predict the effects of the project decisions and be able to take responsibility for them.

In the narrow sense of pedagogue project and technological culture is characterized by the presence motivational systems and value-semantic orientations which reflect its ability to self-development, self-realization and relaxation and are formed in performance engineering, pedagogical and design projects. The main substantive elements in the structure of the design and technological culture we think of design and technology, based on information and communication, technical, artistic, graphic, economic, environmental, educational and others. The future pedagogue’s project and technological culture components of is motivational and evaluative, cognitive, practice-activity, emotional and volitional and reflexive-evaluation which is characterized by the following features: purposefulness, epistemological, technological, diagnostic and corrective (Fig. 1).

CONCLUSION

So, pedagogue’s project and technological culture is an important part of his professional culture. Determine the basis of project and technology pedagogy culture that help us define the essence of the concept of

“project-technological culture”. Design and technology pedagogy culture is seen by us in the context of engineering, teaching and design projection. It is a high-quality integrated professional-personal formation, formed in the conditions of implementation of engineering, pedagogical and design projects. Under the pedagogue’s project and technological culture we understand the dynamic aggregate of elements that combine knowledge, skills, experience, motivation, values, personal qualities which are necessary for effective transformational mastering activity. According to the content structure it is a creative process of self-realization. An important component is its diagnostic procedures, containing the criteria, indicators and tools for measuring performance, the level of formation of competence of students.

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