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## Humanistic Sense of Creativity in Professional University Education: The Role of Creativity in Forming Innovation Model and Modernization of University Training

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### Abstract

The scientific problem of the paper is connected with the "transition" period of the traditional education system that is severely criticized, but each era requires a specific identification of true reasons of divergences lead to reforms. An interesting research variant for these restrictions' overcoming and opportunities to observe how cultural innovations are integrated into the educational system and transform it during the "revolutionary period" of the university development is offered by authors. A professional type of education is associated with the inclusion of the professional training through the regular education. The university education environment is the academic field where the knowledge learning and transmission, as well as preparation for the prospective use of the collected skills are performed, also it is the environment in which the academic elite is shaped, the environment that drills mechanisms and methods of the elite specialists' preparation. The formation of social and cultural potential of an environment in which the reproduction of elite specialists can be achieved through the principles' implementation of the university education as fundamentalization, humanization, environmentalization that creates the possibility of self-realization through the creative development and the ability to express themselves in a problematic situation.

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## **1. Introduction**

Today the educational reforms taking place in society, especially it concerns the university education. This is due to a new quality of the social development and a focus on perspective values. An educational university practice should be considered under the angle of new thinking, corresponding to the relevant worldview. The authors appeal to the hypothesis, the meaning of which is that the fundamental component of a university education cannot have a humanistic sense to the end without a creative component.

Transformation of education systems caused by the following factors, among them there is an exhaustion of the traditional way of the human existence in the culture and the exhaustion of the pre-existing way of thinking. As Vygotsky (2011) wrote, the most important discovery of philosophical anthropology is that the essence of a man is his/her ability to build themselves, it means a constant change of the content to the question of their own essence. Formation of the university elite educational paradigm's characteristics corresponding to the present time is caused by a new outlook on a man. The following approaches as personalism, existentialism and humanistic psychology offer a variety of complex ideas. This situation is truly reflected in the thesis of Sartre (2001, p. 48): "... a man is not intended for him/herself as a given but given to him/herself as an obligation. A man is not what he/she should be. They must build their existence. The essence of a man is a self-healing, denial of themselves as something accepted, the strive for identity. An existential or phenomenological approach to a man is to consider and understand a person "as they are" it means to ontologize the phenomenon of a man.

Nowadays you cannot stay on the stage of the educational paradigm, directed to an effort of the mind to focus less attention on the values of the human existence. There is a necessity to develop new anthropological grounds of an educational paradigm. A personality is unique because self-education focuses on self-development of a man, his/her self-realization and self-actualization. The process of education, science and technology should expand the scope of human freedom. The society (university educational environment, as well) standardizes personal thinking, shapes a person with "mass" standard settings through the particular training methods. Ortega y Gasset (1962) introduced the term "mass-man" to designate such a person. This term names one of the reasons for the formation of "mass" consciousness and that is a domination of science and rationalist way of thinking in the society. Rationalist science, according to the author, is oriented on the technological excellence. A man loses real life landmarks: the purpose, a sense of personal responsibility for the events of the modern history, he/she ceases to be a "living" man. One way to solve this specific and dramatic situation is in the development of personal creative abilities of the individual which are important in the elite educational environment.

## **2. Research methods**

One of the ways to form a conceptual model of an elite education at the university is to incorporate the creative component into the model. This is due to the increasing trend of rapid development of a scientific activity, which is connected with purposeful transformation of the world. The scientific activity in the system of the elite education model should be organically involved into the structure of innovations, along with the design and management. In the basis of the educational process the methodology of creative activities should be put related to the innovation, design and management. It is important to determine the synthesis mechanism of these components. The Elite Education should identify a number of important areas of its perspective formation, one of which is the cultivation of individual innovative abilities.

The innovative ability can be defined as the ability to navigate the new environment, the ability to formulate and solve problems. It is determined not only by education, but the presence of science, technology and culture. The basic dynamics of this ability to change and determine the education. In the educational process a person cultivates the ability to design and creative activities. To do this, a person must form a holistic view of the world in the education system of the world transformation, including the methodology of management and projective methodology.

The innovative education suggests a connection with the design and management of the spiritual and moral assessment, with the requirements of environmental and moral imperatives that act as a criteria for evaluation, design and management. At any level of integrity, you can have multiple solutions. This changes the behavior of a person, especially if decisions are characterized by a different order of preference according to various criteria. If a

person makes a choice for a combination of several disparate and formal criteria (for example, for utility, effectiveness and safety, etc.), the unique solutions will be a rare exception, not the rule. Hazova (1990) noted the meaning and role of the synthesis methodology in the fast changing world - the methodology of management – projective methodology, in her work she wrote that this synthesis is able to set the context of the future mental activity of a specialist, not only professional, but also social. This context is defined by future professionals' understanding a new picture of the world, a man's place in the new world, new principles of people's activities. Accordingly, new priorities in the selection of the educational content, a new perspective of its construction, new technologies and education are meant (Ivanov, 1982). Ideas' realization of this summarizing requires a number of backgrounds, upgrading the content of education and its innovative formation, among them are the following:

- formation of the holistic (from Greek – Holos) outlook (we use the term “holism” to refer to the principle of integrity, but not for “the philosophy of integrity” that is close in the conceptual foundations to the theory of emergent evolution);
- new approach to the content of education, changing the way of its organization: the education should be focused on the problems of the real world, on the professional aspects of the global problems' resolution in our time. Traditional disciplines are the cognitive means in solving the problem - oriented education, developing a motivational environment, autonomy of search the alternative methods to solve issues and questions of self-education;
- content of education should develop tools, methods and principles of thinking, change the whole emphasis of the educational environment. This is the especial modernization of an educational content, which is written in Rozin's works: “... the world studying experience in higher education shows that the basis of education involves not knowledge and learning theories, propped up by the practice but professional training, i.e. the inclusion of a student as soon as possible to the real practical activities (research, engineering, design, management, medical, teaching, etc.), the creation of conditions in which they may adopt the experience and skills from trained specialists (professionals). In a high school it is necessary for students to master the tools, methods, principles of thinking, the main problems, the application of knowledge-based on theories of across disciplines, etc.” (Rozin, 2007, p. 77);
- conversion to the goal of the innovative education and formation of methodological consciousness and methodological culture that is dictated by humanistic possibilities inherent to the methodological consciousness and methodological culture (Ponomarev, 1987). An effective, in the analytical point of view, feature is associated with the formation of methodological consciousness, Hazova (1997) writes that the methodologies of an activity are interdisciplinary, they teach to apply the knowledge from various disciplines in order to achieve practical purposes, they link a theory and practice. Methodologies in themselves are neutral in relation to the subject of the upcoming activities: presenting a scientific description of complex methods, techniques, procedures and tools for detecting and deciding problem situations. Also to build the project the methodologies are developed in the subject material. Possession of methodologies increases the professional and social competences, makes human existence more meaningful, increases the social and occupational freedom, and that is what makes the goal of education global. “In the rules of work on projects, procedures of humanitarian and environmental expertise and humanitarian assessment of a possible result, which implies that an appropriate environmental and humanitarian expertise should be implied. Therefore, among the principles of an expert activity ethical principles of valuable consciousness must have an important place. The methodology acquisition of an activity should become a center of education fundamentalization through a strict selection of materials, the system analysis of the content and highlighting key invariants. Moreover, the methodologies should become thematic elements of the content and structured learning process” (Egoshin & Zhuravleva, 2014).
- development of the capability for reflection as the property of critical thinking, independent and autonomous, which allows realizing one's ownership to the sociosphere, the process of making a decision is associated with the development of reflective mechanisms; humanization of education. It is inherent in the cultivation of reflection, the development of its mechanisms (Mirskaya, 1995);
- development of abilities to the figurative vision, figurative images is a condition of the innovative education's effectiveness, it gives the opportunity to design and manage the correct innovation. It is about a qualitative description of objects as opposed to parametric, developed in engineering education. Shukshunov (2003, p. 39) characterizes the situation: “... about 90% of the courses and all the physico-mathematical “foundations” of the

education deal with the parameters describing the equations with their optimization, etc. As a result, the higher school does not want to recognize the generally accepted fact that the real development of technologies is mainly due to the change of looks. The result of this is a low persistence of students' inventive activity in most universities. In this case the invention may be perceived as a new look. And to handle these looks is the task we almost don't teach". In the literature, there is a point of view, offering a way out of the situation in the use of research results of creative processes the preferences are given to these types of thinking that are used in the solution of professional problems while courses of aesthetics, visual arts, design, introduced in the curricula.

The development of creative thinking is an important basis for the innovative education content. For a concept of the elite education in the modern university, this requirement should be the fundamental criterion in the educational content's modernization. The concept of "creativity" includes a number of mental characteristics that make possible the implementation of the creative process. Creative qualities are observation, sensitivity to new challenges; panoramic thinking, selective memory, fluency and flexibility, originality of thought; the ability to switch from one activity to the other solutions; independence, singularity, originality, the paradoxical ability of foresight, intuition and imagination, erudition. Hazova (1990, p. 44) draws attention to an interesting psychological feature of the process to form a creative thinking when she writes that "... highly creative students have different emotions, among them aggression and joy are dominated, along with that the willingness to come to the aid, the sense of beauty, humor. The next quality that is a part of the creative personality is self-regulation, including a focus on the solution of a great idea, striving for a certain kind of activity, tenacity of attention. A correct and clear statement of the problem and the issue at the level of consciousness organizes and directs the work of the subconscious mind and allows the phase of "insight and discoveries".

Creative elements of creative thinking allows highlighting certain elements of the creative culture of an elite student and this is due to the creative outlook (knowledge among the theory and practice of creativity) methodological principles of creativity (ideological component of the creative culture' structure), skills and abilities defined by a creative experience. Krylova (2000) calls this block a creative activity. Norms, methods and techniques of the creative activity's organization, emotional block of the creative culture (inspiration, risk, excitement). The task of a specialist training is in giving to these properties sustainable skills: at the level of intention the design (to form a creative challenge to see the problem), at the level of the plan implementation (to gain the ability to solve the problem tasks, analyze the options for solutions, focusing on the best result), at the level of the final decision it is a rationally organized labor. The goal to add to the mentioned above properties of the creative activity sustainable abilities and is difficult to get. It should be oriented to the active forms of training: playing modeling, game training methods, situational games and workshops, skills training of algorithms' formation in inventive problems, the development of a reflective-positional method to form the student creative position. The most important task in the process of giving properties of the creative activity the status of ability is to form techniques to think creatively.

Modeling of a professional activity; shaping of a creative atmosphere, with the exception of communication barriers and increase the speed of the group through the use of various gaming devices; freedom of self-determination and development of relations between group members; updating personal life experience, realizing the ideas of the elite educational training at the University require the formation (subsequent implementation in the educational process) and culture of innovation tasks' solutions.

One-criterion version of preparation and innovative solutions of the problem is insufficient. It happens because the search of the optimal variant has serious methodological and worldview limitations. Hiding internal conflicting tasks almost does not provide information for the next step of innovation, creating a false impression of the principal close in the innovation process. It creates a subconscious belief that the problems of transformation have unique solutions, as well as the problem of knowledge. This is a situation in which the need for humanized orientation of engineering education by strengthening the direction of scientific and technological education should be a powerful channel for implementation of humanistic ideas in the elite education at the university, what must be preceded by the conceptual development of leading values in the sociosphere and cultural environment. Focusing on the fundamental importance of the system, the specialist will be able to make value-based decisions. At the turn of 20th - 21st centuries an educational trend moves from a disciplinary-based model of education to a creative design. In the last the focus on a personal-active approach to learning is not hard to plumb. That means the statement that the basis of the educational process is not only in learning, but also in ways to master it, as a background for the development of an elite specialist's creative potential. Analyzing the necessity for the problematic nature of the educational

process, Dmitrienko (1989, p. 87) writes: "... the requirement of individualization is to identify such personal traits that can give maximum benefits to the society. The main orientation of the teacher is focused on the most different qualities of personal traits. The methods used in this case are summarized and varied, they refer to all the properties of an individual, influencing their activity, interest, imagination, emotional sphere". The author marks an important circumstance, the sense of which is in tasks' unity of an innovative socialization. These problems exist simultaneously during training, as in one subject there are areas that have to be studied, and those which are open for the research. Dmitrienko (1989) indicates also the mobility of the boundaries between these two types of problems, links this mobility with the development of the domain areas, suggesting that an integration of the individual approach is different, depending on which side of the border, we are currently teaching. To solve the problem of the elite specialists' training in the modern university a radical change of the educational process is needed, allowing to move away from the traditional passive teaching to students of an educational material to the principle of an active learning. Teaching form of an educational material's presenting is necessary in the course of natural sciences. Thus, the birth of the active learning style, when a student finds new self-knowledge, which will be a proof of his/her potential.

The transformation of the educational system in a modern university makes obvious the need for a values' reorientation. In this process, there is a registration of parameters in a new educational ideal. The dominant feature of this ideal is the discovery of human potential, which enables the individual to adapt to the rapidly changing environment. The ideal educational institution at some point conflict with the values and interests of certain social institutions. In "transition" periods the traditional system of education is sharply criticized. Every age requires a specific identification of the true reason for discrepancies that lead to reforms. This requirement holds for the modern ideal of education: opening a limitless potential of every person.

Lyurey (2011) offered an interesting option to overcome such limitations and opportunities to observe how in the "revolutionary periods" of the Education Institute the cultural innovations "enter" in the educational system and transform it. The methodology of "research types" by Weber (1990) allows making it true; it gives the possible to build "an ideal type of personality" created by a particular system of education in a particular period to see the discrepancy between the proclaimed objectives of education and the real role played in education and training. The study of this process makes it possible to define the "ideal-type" of a social institution structure; this structure is determined in accordance with the leading "values of the epoch, "assignment to values" and defined by relations of these leading values with the objectives of a formal education. This idea to use the methodology of "research types" by Weber (1990) gives ample opportunities in determining the mechanism of intellectual elite selection in a modern university: perceived as a value of education, including the university education. In terms of a social phenomenon it can be identified as a cultural phenomenon, when the fact of this type allocation indicates its social importance.

### **3. Overview of results**

Preservation of historical continuity, involving innovations, "the future anticipation" - all these in each particular epoch determine the content of the values that are important for the society and set the goals of education. Education serves as a link between the cultural potential and its actually used component. The boundaries that society puts for its further development are especially evident in the education system. Secondly, education analysis as a value is associated with the representation of it as a unique and individual act of "integration" in a cultural environment. This concept of "an educated man" fixes the certain valuable attitude to the person who has passed a certain education cycle. The methodology of Weber (1990) is taking as a base, where it is possible to distinguish such types of educational systems as: a traditional education; a professional system of education and a creative type of education. And precisely because of these educational systems' types the concept of "education types of the personality" can be introduced and formed by an educational institution of social ideals. It occurs in a specific period and the typology of educational systems makes it possible to show how institutional forms of education have shaped a specific type of education. So the traditional type of education is due to the habits, customs, and beliefs, shared by the entire group. The person acts according to the traditions and it is not necessary for him/her to set a goal, determine the values, they simply obey the established rules of the society. And the whole educational system coincides with the life of society. The traditional type of education is typical for the firstly separated educational institution, when the

reproduction of socially important values of a group is closely related to the social stratification into classes. Since the main value in this period is the preservation and reproduction of the social stratification structure, the main task of the institute is an educational objective. The professions are taught out of the Education Institute. The professional type of education is associated with the implementation of a profession transfer through the regular education. Here, as for example, Dmitrienko (1989) supposes (it is cited above in the monographic study) there is a view of two aspects of education division: training and education. Training and education are characterized by formal relationship, the reasons for which are as follows:

- 1) education factor is the individual's membership in a particular social group, and the existence of these groups in a society is the basis for an education and training division;
- 2) sufficient independence of professional acquisition is a stage in the educational development;
- 3) system of values is derived from the sphere of the educational institution, it sets the orientation and operates, makes tasks (explicit and implicit), but does not form them; the existing educational system is adapted for the reproduction of an aloof labor, and this labor presents goals, life values, ideals and aspirations from the work sphere. Reproduction of “educated people”, in particular, a fragmentary activity of individuals does not have effective methods to cover the reproduction of those life areas where these purposes are formed.

The methodology of the “ideal type” allows revealing the essential characteristics of an individually unique and historical event or phenomenon (in our case - the institution of education), if it is real to “differentiate” a value judgment and “referring to the value”. Turning to the modern era, and being members of its events, it becomes difficult to identify those major values that can be used as a basis for constructing an “ideal type” of modern education. However, focusing on the modern ideal of education, it is possible to plan those areas that will be most fruitful for improving the existing system of the elite education, for building of projects and programs for its reconstruction (Bogoyavlenskaya, 1990).

The existential dependence of education means that for an individual in culture the areas connecting with semantic and valuable self-determination of the individual are very important. The Institute of Education does not form spiritual integrity of an individual. How to find values, how to shape responsibility, how to make a choice? The existing system of education helps address these issues unconsciously. There is a necessity to define a related area that is able to mediate the freedom of an individual and time regular education at the same time. This is an area where meanings, purposes and valuable strategies are trained. If to summarize a personal experience of residence with a teaching process (a connection to the work, profession and other factors of an adult life) - like the dual training in Germany, where the merging of personal interests with social needs happens as the professional experience of mastering the culture; in this case the problem method used in the educational process will be fully applied and the mechanism of an individual entering into the culture will be obvious. They help learners acquire their own experience of living of personally significant situations. Then a problem of multicultural development will be solved, enclosed in removing the “natural” setting and a way out to the “other”, in an existential act of choice or exploring a foreign culture.

The important point is to address to the fundamentals of human existence. It becomes possible through an appeal to cognitive abilities, emotional, volitional and ethical qualities, such as art, which acts as a means of restoring the lost integrity of life. Education is really an “anti-crisis action” (the term of Witte, 1991), allowing you to prepare in a full way for the transmission of an intellectual capital and its absorption.

A university education space is an academic environment within which the learning, transmission and preparation for the prospective use of the accumulated knowledge happen. The environment in which the academic elite is formed, where it is important to practice the mechanisms and methods of training specialists of an elite level. The implementation of the highest professional potential requires an adequate environment in which the reproduction of the brainy and talented specialists is possible. Involving a Master's level of training in the university should not be associated with getting the Bachelor's degree with honors – it is just one of the factors. The formation of social and cultural potential of the surrounding, where the reproduction of elite specialists can be carried out becomes possible through the implementation of the university education principles as fundamentalization, humanization, environmentalization. This creates an opportunity for self-realization through the development of the creative potential, the ability to express themselves in a problematic situation. The reproduction of such a specialist can be done through the competitive selection process, with a focus on abilities, and then – “education” of an elite specialist through his/her reproduction in the scientific school, where only interpersonal relationship “student – teacher” can

be realized. The system of competitive selection should have the character of a through action, including a period of pre and post - university selections. A change-over to an individual work with talented students whose potential may be determined by establishing a coefficient of intellectual development using the existing opportunities at the University of Psychological Services is required.

What is the scientific school and its role in the reproduction of the university's intellectual elite? An outstanding scientist is grown by an outstanding teacher. For the university a research school has a great potential. A research school is not the only norm of the collective work (for example, there is such a form as the “invisible colleges” it is a reference group formed by a custom). The role of a scientific school in the reproduction of the elite professional in the modern university assumes the process of formation and development of a scientific school including the harmony of research and studying, the unity of teaching to create and research processes. The major aspect for one who is prepared for the research sphere is reality cognition. The process of formation the intellectual position arises within the communion of the student to the scientific school. This is reflected in the conscious choice of direction, in a special approach to the problem, in the development of the way to think and design of your own concept. The idea of Znaniecki (2013) is paid a special interest, “a social role of a man of science” is above all, a unique style of thinking and acting in to solving scientific problems; while the problems may vary, but the way of thinking as a way of reasoning and evidence remains unchanged. The importance of the style of scientific thinking in the intellectual elite formation at the modern university can be seen in the thesis: as long as a mature scientist’s style reflects the imprint of his/her early experience, the reason to raise the question about the possibility to transmit a master’s style to his/her students is justified. The conclusion: the possibility of constructing intellectual genealogies to understand the meaning of a particular person’s work is to remember who a master of his/her teacher is. This is an important aspect of the scientific schools’ formation. The process of this is due to an interpersonal style. With a help of this style a researcher relates his/her personal passion for science with the life of the scientific community to which he/she belongs. Some features of scientific schools can be identified on the basis of an informal understanding of the style. Assessing the role of a scientific school’s leader in the formation of elite specialists, the authors appeal not only to the results of the scientific school, but also to the fact how these results are obtained. Justus von Liebig wrote that the universe is filled with countless germs of spiritual life, and only in a few rare minds there is a way for the development of these germs, - “an ideal comes to life in the creative act”: the teacher and the researcher see the main line of science, defines trends of development.

The value and importance of such a stable structure as a scientific school in the education of elite rank specialists at the university due to the unity of the problems, research methods and interpretation of research results. A scientific school plays the role of an initiation means to the study: in the process of “an initiation into science”, a student learns the conceptual apparatus, values, a categorical structure. The introduction to the scientific community, to the logic of study forms a creative person. The study is individual, and a future researcher is formed in the process of communicating with those to whom the science is unique, this process of communication forms the motivational settings, a style of thinking of the future researcher, without it the creativity is impossible. Polanyi (1985) in his “Personal knowledge” wrote that the researchers are formed not only by the ideas of science, but also by men of science (their identity, style of thinking, motives and creativity); the research finding has something that can be learnt only through a direct communication and relationship of “Master’ – “Student”. The researcher called it “non-formalizable components” of research findings. A student perceive them in a direct communication; they cannot be learnt through the text, they are non-verbalized and unconscious by neither a teacher nor a student. Polanyi (1985) wrote that these non-formalizable components are unalienable from the inner psychic world of a researcher and called them intelligent components, meaning by this, obviously, the impact of the personal appearance of a leader-teacher to those who are around him/her.

It is necessary to distinguish the forms of motivation. The leader of the scientific school creates a certain motivational attitude. The motivation itself can be internal and external. Pel’c & Andrews (1973) in their study “Scientists in organizations” describe an internal motivation as a management of understanding one’s own ideas, while an external motivation is presented as a plan of research made by ideas of others, so these researchers argued that the efficiency of investigations in the case of internal motivation is higher, however indicators as “own ideas” and “the leader as a source of motivation” are correlated negatively. Yaroshevsky (1977) in the study “The logic of science and the scientific school” proposes a scheme “triplane interpretation of the internal motivation”. In this

scheme the role of “the third dimension” performs “a subject and logical content of the dual activity of an individual”. This is a situation in which the leader of a school group or community involves students in research programs that reflect not hopeless ideas but demands of the logic of the science that stimulates an internal motivation. The role of a scientific school in the formation of a unique style of thinking of the future researchers is hard to overestimate since every school is unique. The tradition of harmony and search for new conceptual and methodological approaches arising from the unique intuitive gift of the school leader are encouraged. Let’s have a look at an extract from Born (1977). Firstly, it is a description of the experience facts not an abundance of individual details but a well-ordered and overviewed material. This is followed by a simple summarizing necessary for creativity suddenly appeared in the form of a mathematical problem. Finally, the calculation is performed, which can be defined in this principle: “Mathematics has always understood itself”. At the same time, depending on the pre-training of students the term “strictness” has a very different measure. Controversial techniques acquire an amazing ability to a persuasion in Sommerfeld (1973) work, based on the enthusiasm with which the whole picture of events is portrayed. As a result of the deduction a new result is reached. In a student’s heart a storm of feelings appears, including the discovery of the important findings, expressed by simple and inspirational words. An expression of joy and pride of that you cope with snatching a piece of truth by nature. This is the highest art of teaching wouldn’t have given anything if the direct spiritual thread between a teacher and a student had not been established. The scene of this process is the workshop, where, thanks to successfully set tasks students try the sharpness of their mind. Students’ introduction to the scientific school plays in the elite education a huge role, as a condition and background of the continuous training in the development of educational and scientific traditions. It plays the role of a powerful communion means to develop the creative abilities of the individual student. In the process of initiation a background of acquired knowledge perception by those who are not a part of the scientific school is appeared (Weber, 1990).

The peculiarity of productive relationship “student-teacher” arising within the framework of the scientific school, as Hagstrom (1965) noticed and wrote that the student independence depends on the reaction of the teacher: the teacher’s grade is almost always perceived as a determinant of that it actually is. The personal development and self-reliance should be encouraged and supported by a teacher: Aristotle wrote that “a teacher does not give to all students the same knowledge”.

#### 4. Conclusion

The research acquisition, studying of scientific and methodological apparatus, learning the specific of interpersonal relationships, participation in the system of social roles and statuses that exist at schools happen in the process of talented youth fusion. “Personal” knowledge transfer from teacher to student occurs through the formation and choice of scientific problems, methods of construction and the implementation of research programs, from intuitive hypotheses to general theories that constitute the invariant core of science. This is one of the elite specialist reproduction forms in the university. During the implementation of this form non-formalizable training and hard verbalized mechanisms of scientific creativity can be observed. The process of learning is realized at an individual level, it is a special form of an intellectual, motivational and “overconscious” activity (the term of Yaroshevsky, 1977) – it is a special form of neophytes’ training in the scientific school. Scientific School as the type of the scientific community and a form of cooperation in the elite-level professionals’ preparation performs a number of functions, where the special role is paid to an educational function because in the process of teacher-student communication a special area of communication that promotes joining to ideas, methods and traditions of the scientific school is created. Within the scientific school not only knowledge transmission takes place (this is the attributive function of the scientific school), but also introduction to traditions, combined with the search for new. Emphasizing the role of scientific school in the preparation of elite specialists is one of the invariant features of a scientific school (along with such features as: scientific school is a form of scientific cooperation that constitutes Research Program as a dominant feature and the leader is a prominent scientist and the school combines same values, moral Egos, way of thinking etc.) –the work on a research program is related to the processes of training and education, the last obtains the status of equivalent components and the scientific school provides a basis for the individual creative abilities’ formation, no matter what type of a scientific school student deals with (research team, scientific direction, or something else). Polani (1985) in his work “Personal knowledge” noted an important feature



of the scientific school environment - within it there is a direct connection between the “Master of Science” and his “Student”, research questioning includes informal components (cognitive components of the scientific activity), their learning occurs only through communication: they cannot be passed through the text, they are not verbalized, they sometimes unconsciousness by the researcher. This “personal knowledge” (represents non-verbalized mechanisms of the scientific creativity), considered by the researcher, poses a beyond identification knowledge connected with a formally well-trained intellect. Polanyi (1985) believed that within the scientific school training of “personal knowledge” is the most important source of the creative process, and the authors suppose the component of creative thinking style, “creative thinking” (the term of Toynbee, 1987), as the key source of the creative process formation, the ability to get in future the highest index in the field of one’s activity. This “creative minority” will become the intellectual elite prepared by universities. The communication with the leader of the scientific school (“Master of Science”) will give the opportunity to realize the idea of the relay race.

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