Development of Student's Creativity in Informational and Educational Environment

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The work presents a review of the problem of student's creativity development in informational and educational environment of educational organization. Article presents theoretical basis of student's creativity development in informational and educational environment of educational organization. Essential characteristics of creativity concept such as development levels, structural components (operational, cognitive and motivational) are analyzed in the article along with conceptual field of the problem of student's creativity development in informational and educational environment of educational organization. Age specific of the youth that has substantial impact on student's creativity development has been revealed. Informational and educational environment of educational organization that contains external factors of student's creativity development is viewed as a system of informational educational resources and tools that provide conditions for realization of the main educational program of educational organization. Informational and educational environment of educational organization is characterized by such features as openness, humanitarian character, variability, ICT availability (availability of information and communication technologies). Besides pedagogical conditions of organization of informational and educational environment of educational organization aimed on development of student's creativity under the condition of informatization of educational process are presented. Considering of informational and educational environment in the context of student's preparation to life in information society and design of this environment on the base of activity approach is one of essential conditions. The other condition of development of student's creativity is project activity as the main type of activity. Preparation of pedagogical team of educational organization to collective creative work of students and pedagogues in development and effective application of multimedia resources in educational process is important condition of development of student's creativity.

Key words: Ability, creativity, informational and educational environment, project method, information and communication technologies.

Various professions are highly valued in today society but people with developed creativity have a guaranteed perspective to find the way to realize their abilities in professional activity. Foundations of development of student’s creativity are being laid in all levels of education. From the point of view of dynamics, education is the only dedicated process that is characterized by adoption of experience of former generations; bringing up of typological features of personality; forming of motivation to train throughout the whole life; intellectual, spiritual and moral, creative and physical and(or) professional development of a person (On education in Russian Federation Federal Law #273-FL dated 12/29/2012.). Development of student’s personality including student’s creativity is realized indirectly in the process of education and upbringing.

But according to theory and practice of pedagogy of professional training opposition between society’s demand for creative
development, self-realization of personality of a future professional and insufficient attention paid by today higher educational institutions to this problem; between existing standard system of students training and their will to individual an creative activity, self-education and self-realization still exists.

Analyzing current situation in pedagogical practice basing of the works of pedagogues and psychologists (Ryndak V.G. et al., 2001, Polat E.S. et al., 2001, Petrov A.V., 2002, Lapchik M.P., 2007, Bogerman W. G., 1947; Mednich S.A., 1969; Karlson Y.L., 1978; DominikPetko, 2012; Sun Caiyun, 2012; Dong Yan and Wu Lan, 2013) we may come to conclusion that information and communication technologies (ICT) become a priority because they reveal new possibilities of student’s personality development, development of his(her) creativity by methods that are adequate to aims and tasks of education in today stage of educational system development. At the same time all the factors of student’s creativity development lay in informational and educational environment of educational organization.

The main priority of pedagogical activity should be purposeful, system and efficient promotion of student’s creativity development to make him(her) prepared to fulfillment of professional functions in the best way. In this direction effectiveness of training of future professionals fully depends on development of ability of creative transformation of environment, independence in solving practical tasks.

Requirements to conditions of realization of main educational programs bind educational organization of higher education to form social and cultural environment, create conditions necessary to all-round development of student’s personality including his(her) creativity. For purposeful development of creativity student may also join creative unions, attend disciplines and optional courses that presuppose active use of computer aided design.

Development of creative personality is possible only under the condition of individual approach in education, realization of mutual projects with teachers and students, effective application of various information and communication technologies.

**METHODS**

Such theoretical methods of research as comparative analysis and synthesis, generalization, abstracting and modeling have been actively used in study of philosophical, psychological and pedagogical literature covering the problems of student’s creativity development, theoretical and practical dimensions of forming of informational and educational environment of educational organization, as well as in analyzing of some sides of practical experience.

The following logic chain of concept study was defined as a result of analysis of conceptual field of the problem of development of student’s creativity in informational and educational environment of educational organization: abilities – creative activity – creativity – structural components of creativity – age specifics of youth – personality development conditions – information and educational environment – project activity.

**RESULTS**

The concept “ability” is used to explain different results achieved by different people in similar or almost similar conditions. Ability is understood as an internal condition, as something that cannot be reduced to knowledge, competence and skills but helps to explain or support their rapid adoption, mastering and effective application in practice.

According to Teplov B.M., three basis ideas are contained in the concept of “ability”. Firstly, abilities include individual psychological characteristics that make one person different from another. Secondly, not all general individual capabilities are called abilities but only those relating to effectiveness of some activity or a number of activities. Thirdly, the idea of “ability” cannot be reduced to knowledge, competence and skills that have been already developed by a certain man” (Teplov B.M., 1969). He also stressed that the main characteristic of abilities is their quality and determined two levels of abilities’ development: reproductive and creative. Personality on the first level of abilities’ development demonstrates high capability to master skill, adopt knowledge, learn, train activity.
and fulfill it according to given pattern, in accordance with proposed idea. On the next (creative) level of abilities development a man creates something new, original.

Considering a person of student as a human individual that acts as a subject of interpersonal and social relations and conscious activity one may conclude that the work of a person at self-improvement is highly important in development of a person’s abilities including creativity.

Psychology and pedagogy of cognitive activity define creativity in the context of general intellectual capabilities (Wollach M.A., Kogan N.A., 1965; Druzhinin V.N., 2000; Ryndak V.G., 2001). In the scope of our research we define cognitive type of activity as the space of student’s creativity development. Cognitive activity is integral part of creative work because it is mental activity that results in understanding (interpretation) of something. Creative work is activity that produces something qualitatively new that is characterized by unique character, originality and social and historical unicity. It is an active interaction of a subject with object during which subject changes surrounding world, creates new, socially valuable in compliance with requirements of objective patterns (Ryndak V.G., 2001).

Y. Guilford defined creativity as divergent thinking (from late Latin *Divergentia* – difference). It is the way of thinking characterized by capability to generate a number of similarly correct ideas in solving some problem (Guilford Y. P., 1967). According to E. Torrance, universal cognitive creative capability is capability to sharpened perception of drawbacks, gaps in knowledge, disharmony (Torrance E. P., 1964).

In the present work creativity is understood as integrative capabilities of a person represented in each individual in different extent that support successful fulfillment of different types of creative activity and are manifested by the style of its realization.

According to D.B. Bogoyavlenskaya the main indicator of creativity is intellectual activity that consists of two components – cognitive (general mental abilities) and motivational. Criterium of creativity manifestation is the character of realization of mental tasks presented to a person (Bogoyavlenskaya D.V., 2000). Torrance also mentioned in his works such characteristics of creativity as capability to create problems and contradictions as well as stipulate hypotheses about missing reference data (Torrance E. P., 1974).

Therefore sets of features that describe characteristics of creative cognitive activity may be used as criteria of creativity development. From the point of view of activity approach creativity may manifest itself in different ways both on the level of personality at large (scientific, technical creativity) and in separate components of cognitive activity – in solving problem situations, project activity, etc.

Basing on activity approach structure of creativity comprises of operational, cognitive and motivational components. In our research creativity in the scope of operational component is characterized by indicators defined by Y. Guilford: speed, flexibility, originality, accuracy. Cognitive (related to knowledge) component is the second structural component of creativity. It is characterized by cognitive interests that manifest themselves by diversity of mental operations, ways of mental activity applied by an individual and breadth of mental outlook. Third component in the structure of creativity of a person is motivational component that is characterized by presence of the need and interest in carrying out creative work.

One cannot understand and consider abilities outside of a person. Creativity development and personality development — are correlated processes. Youth is the stage of socialization, transfer from dependent position of childhood to independent and responsible activity of a grown-up that requires developed creativity and transformative attitude to reality. The most important novices of youth are development of theoretical thinking; philosophic reflection; will to abstract thinking, wide generalization, search for general patterns and principles that may be drawn from particular cases; tend to overestimate the strength of the own intellect, knowledge level and independence.

To improve the level of individuality in interests and abilities, individual style of mental activity. Development of the means of cognition often gets ahead of personality development. Youth is the
most sensitive period of creativity development in the process of work with such software used on information and communication technologies as Power Point, FrontPage 8 Visual Basic, that correlate with psychological specifics of the youth. Development of man’s abilities is closely related to development of his interests. Interest is an individual feature of a person, its commitment to what a man consider the most valuable in his life. B.M. Teplov thought that abilities are in constant development because otherwise they cannot exist. We keep a certain abilities and further develop them only under the effect of aggregate of external factors and due to constant training. So abilities are internal conditions of development of personality of a man that are being formed and developed in the process of his interaction with outer world.

Impact of outer factors and influence of informational and educational environment plays positive role. It has been determined that reinforcement of initial abilities with the influence of environment is critically important for creativity development. Such impact has «high degree of uncertainty and potential diversity and has samples of creativity and its results» that are perceived by members of project activity (Guilford Y. P., 1967).

Let us consider different points of view in definition of direct understanding of the concept of informational and educational environment.

Informational and educational environment is usually defined as follows:

a) System of informational educational resources and tools, that provide conditions for realization of the main educational program of educational institution;

b) Systematically organized aggregate of informational, technical, methodical provisioning inseparably linked with a man as a subject of educational process;

c) Common informational and educational space built by integration of information on traditional and electronic media, computer and telecom-aided interaction technologies, including virtual libraries, distributed databases, educational and methodical complexes and extended tool of didactic materials (Forming of humanitarian informational and educational environment, 2012)

Basing on analysis of a number of definitions of informational and educational environment one may conclude that from the point of view of structural organization informational and educational environment is pedagogical system plus its provisioning — staff, material and technical, informational and methodical and educational and methodical support.

According to Federal State Standards informational and educational environment should be open, humanitarian, variable and has high availability of informational and communicational technologies. Open and humanitarian character of informational and educational environment of educational organization may be defined as capability to detect and account for changes of environment for the sake of its own development, with account for interests, rights and freedoms of subjects of educational activity. High availability of informational and communicational technologies is active use of information processes, multimedia components including those based on computers in educational activity. Open character and high availability of informational and communicational technologies presuppose interaction inside the environment with society including interaction via Internet. Variability is realized in the content of education, in choice of organizational forms of education, in used tools.

Let us consider the stages of forming of informational and educational environment of educational organization. Education model defined by accepted aims, projected results of education and the character of prospective collective actions of a teacher and students in educational process is being founded in conceptual stage. Project stage is related to working out the project of educational process by teachers. Defining procedural side of prospective activity pedagogue grounds the order of his actions content of individual steps. In the next stage of project creation a teacher analyses available resources including electronic ones. Results of analysis of resources available for teacher allow passing to next stage of project work that is modeling of their use in further activity. Analysis of available possibilities will be directly
linked with the choice of specific ways of achieving aims and obtaining planned educational results. Further actions of pedagogue are related to organization of adoption of teaching material by students and development of creativity and the functions of educational tools comprising informational and educational environment are highly diverse on this stage (Forming of humanitarian informational and educational environment, 2012).

Project-driven education technology on computer base with relevant software is one of the leading technologies of creativity development. Application of project-driven education may be more effective when education process is characterized by development of creative thinking as necessary condition of realization of project activity with the help of information and communication technologies. The role of a teacher changes dramatically, his dominating role in the process of adoption of knowledge and experience is has been eliminated. Personal qualities of students that may be developed only on the base of information and communication and cannot be adopted verbally are also developing. Students are engaged in “knowledge mining” with the help of information and communication technologies. Creative tasks are prevailing in classes.

Students use different information and communication tools to solve creative tasks that correlate with psychological and physiological specifics of youth. Power Point, FrontPage 8 Visual Basic are among these tools. Project-driven education complies with requirements of today education because stimulates student’s interests by means of creative tasks. Students study to interpret and apply information rather than simply memorize it. Development of creative abilities of a person that is characterized by transformational attitude to reality is possible only with individual approach, project activity, using different means of information and communication technologies. Using information and communication technologies and their integration in educational process is undoubtedly urgent. It is natural that effectiveness of this process is defined by the level of competence of teachers of educational organization in information and communication technologies as well.

Let us consider a number of programing tools that allow organizing collective creative activity of students and pedagogues provided teachers are ready to such an activity.

Power Point application is multimedia package for presentations and slide-shows. It provides user with all necessary functions including powerful text processor, drawing instruments, diagram plotting instruments, wide range of standard slides’ templates, etc.

FrontPage application is editing software for web-pages design. It uses “visual design” method and specialized document formatting language HTML.

Visual Basic framework allows visualizing the process of design of graphic interface of developed application, i.e. create objects and assign object’s attributes via dialog boxes of programing system.

Technology of project development in Power Point, FrontPage and Visual Basic is being organized on the base of general theory of project activity. Project activity is in the context of one-step educational strategy.

In our work we rely on the following list of stages that reflects the content of project activity: pre-project stage, project stage (the stage of actual realization of project), reflexive stage, post-project stage.

Pre-project stage. The beginning of project activity is being anticipated by the stage intended for creation of prerequisites for effective design and its psychological, pedagogical, methodological, organizational, information and methodical and material and technical support. This stage includes such operations as diagnostics, problem setting, goal-setting, conceptualization and its preliminary socialization. In the scope of creation conditions for effective pedagogical efficiency of initial stage of project activity pedagogue should provide the following:

a) Arousal and further stimulation of lively, natural interest of students to search of a problem that may be the core of future project;

b) Substantial degree of freedom of the search in information and educational environment of classes;

c) Access to necessary, actual, reliable
d) Availability of different means and tools for study of reality to subjects of project activity;
e) Possibility to interact and exchange impressions with other project members;
f) Timely aid in analysis, generation and further representation of obtained data;
g) Free use of such programs as Power Point, Front Page and Visual Basic.

Domain of developed project, topic, aim, tasks of the project and functions of each student, structure and types of used information, terms of presentation of project.

Project stage. This stage consists of such operations as refinement of an aim, tasks, functions and work plan by each member of the project; one-step fulfillment of planned actions; correction of progress and actions of project members on the base of feedback; obtaining and internal assessment of a certain product; presentation of final results of the work and their external expertise (getting score).

For example, control items are placed in a form in Visual Basic environment, their attributes are being changed, event-trigger procedures are being created, project’s layout is made that is development of the project’s interface in this stage in the scope of project development. Then the project is filled with information (audio, video, text, graphics). Web-page design is developed in this stage with FrontPage, images, text, audio, interactive buttons are being placed. Information content and control items are distributed among slides in accordance with dedicated structure in Power Point.

Reflexive stage. This stage deals with assessment of productive but mainly personal results of project. Such objects as the whole progress of project and the system of relations that has been developed between subjects in the period of project activity are subject to reflection. Reflection at the end of the project is an appeal of project members to themselves and to each other in new quality from the point of view of the experience of cooperation.

Reflexive stage consists of the following operations: reflection on the idea of project, its progress and results.

Presentation and discussion of each project takes place in reflexive stage, best project in categories “Scientific achievements”, “Project design”, “Best ideas” and so on are chosen. As presentation of final product of project activity is socially valuable action it should be if possible added wide social appeal depending on direct context of the project (faculty, region, pedagogical community, educational process, public event, educational system modernization).

Post-project stage. This stage is being realized immediately after project activity, presentation and getting score.

Post-project stage consists of such operations as validation, dissemination of results and products of project activity; choice of possible sequent projects (arousal of new project idea, basing on the results of previous project, joining of projects, etc.).

Project validation procedure included in post-project stage is necessary condition because this procedure allows “testing” product both in preset and in varying conditions.

All stages of project activity are equally necessary from pedagogical point of view. Project activity success is defined by complex provisioning of each stage with adequate ways, means and tools as well as growing up creativity of project subjects.

Teacher qualification level, his readiness to work over the project together with student, to use effectively modern information and communication technologies, his project abilities in creation of information and educational environment in classes and organization of students work in this environment with various tools is one of valuable factors of development of student’s personality including his creativity.

Today pedagogue lives and works in the period of global changes in society and therefore in education. For example, the content of education is changing (third generation standards are being introduced, projects of federal state educational standards of higher professional education 3+ are being considered), such educational technologies as electronic-based education and remote educational technologies are widely used. But K.D. Ushinski wrote that nothing may be improved in education and training, in all school system beyond the head of a teacher. So it is pedagogue who is the key person of all system
modernizations in education and success of innovations depends mainly of a teacher.

To prepare pedagogues to team work with students with the help of information and communication technologies series of seminars, trainings to study the experience of colleagues in using electronic education tools, remote education technologies, tools of networked interaction with subjects of educational process in information and education environment of educational organization are planned in the scope of research. It is also planned to organize series of seminars and trainings to study ways, methods and technologies of student’s creativity development.

DISCUSSION

In the period of the shift of education to third generation federal state standards a certain contradiction may be observed between frame and algorithms set by the standard and society demand for creatively thinking specialists.

At the same time the problem of creativity development is not new. It was analyzed in works of numerous pedagogues and psychologists. But modernization processes in all levels of Russian education put special focus on problems of system modernization of the content of education, information and educational environment, pedagogical technologies and tools that allows increasing the quality of preparation of future specialists (Forming of humanitarian informational and educational environment, 2012; Vorobiova S.V. et al., 2013).

One of the possibilities of system revamp of the content of higher professional education is introduction of tasks related to situations of decision making or defining strategy that promote students to seek the ways to settle problems of real life with the help of information and communication technologies and also helps students to rethink possibilities of different information and communication tools to solve different types of tasks. Students’ involvement in solving such types of situations may be viewed as one of directions of development of motivation of achievement and motivational component of student’s creativity (Mesheryakova I.N., 2013).

The problem of the quality of educational results gets pressing character due to the problem of student’s personality development in the space of educational organization. The quality of educational services is conditioned by the quality of educational process and the quality of provided conditions (staff, educational and methodical, information and methodical materials, etc.) (Mesheryakova I.N., 2012).

Openness is one of indicators of educational organization effectiveness. Therefore selection of instruments of organization of educational subjects’ interaction in information and educational environment of educational organization is necessary for effective development of student’s personality including his creativity (Mesheryakova I.N. and N.M. Mikhailova, 2013; N.M. Mikhailova and Mesheryakova I.N., 2012).

Accumulation of material on realization of system modernizations of higher professional education and carrying on “forming” experiment of student’s creativity development could make possible empirical analysis of effectiveness of development of student’s creativity under the condition of education informatization and application of state educational third generation standards of higher education.

CONCLUSION

The main concept that is described by modern Russian education from the point of view of its mission and targets is “development”, including development of creativity of a student as future professional. Creativity is understood as integrative abilities of personality represented in each individual in different extent that promote successful fulfillment of different kinds of creative activity and that are manifested by the style of its fulfillment. Operational, cognitive and motivational components are structural components of creativity.

To develop creativity it is necessary to strengthen initial abilities with the effect of informational and educational environment of educational organization that is characterized by such characteristics as openness, humanitarian character, variability, availability of ICT. Pedagogical conditions of organization of informational and educational environment of
educational organization aimed on development of student's creativity in the situation of informatization of education and application of state third generation standards of higher education are the following: viewing informational and educational environment in the context of preparation of a student to life in information society and its design on the base of activity approach; project activity is leading type of activity; preparation of pedagogical team to collective activity of students and pedagogue in creation and using multimedia resources in educational process.

REFERENCES