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Development of Informational and Communicative Competency of Masters of Education on the Basis of Multimedia Technologies in the Collaborative Learning University Environment

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The work contains analysis of advantages of multimedia technologies application for developing informational and communicative competency for Master of Education program of study within informational educational university environment. It also describes informational educational environment for organizing the academic process within module based Master's program which supposes realization of collaborative learning environment (CLE).

Keywords: informational and communicative competency, multimedia technologies, collaborative learning university environment, masters of education.

Point

At the present moment the system of education in Russia is undergoing the process of modernization caused by the deep structural changes taking place in the modern world. These changes demand development of new approaches towards education for both secondary schools and higher education. The scientific background of this modernization is described in the works by: V.A. Bolotov, V.V. Krayevsky, V.G. Kinelev, A.A. Kuznetsov, V.V. Laptev, G.P. Shchedrovitsky, etc.

Most higher educational institutions of the Russian Federation now are oriented toward formation of the basic and professional students' competencies, though these innovations are introduced in the real academic process non-

systematically. Elements of competency approach are included into the existing model of professional training (e.g.: methods of V.A. Bolotov, V.V. Serikov, etc.) are introduced into higher professional education standards for competency model of the modern specialist. (Y.G. Tatur, V.D. Shadrikov, etc.). The most important result of the educational institution activity is now not the system of knowledge, ability and skill but the set of key competencies.

Competency approach demands the changes in the academic process as developing the basic and professional competencies needs training situations. These situations modeling professional activity of a teacher may be realized in the special electronic collaborative learning environments allowing the teacher to introduce

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effective control over the students' activity in the virtual training environment (A.V. Vishnyakova, O.G. Smolyaninova, etc.).

Transition to the two-level Bachelor/Master system of education, joining the Bologna process, a course toward the educational standards of the third generation all this taking place in Russia makes necessary real changes in the academic, methodological and organizational patterns. The system of certification the competencies worked out by the OCR distinguishes the key competencies of several levels, these competencies should be taken into consideration for training of highly-qualified professionals irrespective their professional area (The Council of Europe, 1996).

The basic condition for the formation of the basic competencies is creating environment for realizing the activity important for people (G. Raven). This important activity may be modeled in the university informational educational environment (by means of training games, project work, workshops). Developmental environment does not place unconditional restrictions to realization of the intentions; on the contrary, it creates conditions to reveal and develop talents: it stimulates to participate in decision taking process and assures distribution of responsibility.

Implementation of the system of educational credits and reconstruction of the academic programs within the competency paradigm demand from the modern higher educational institution fundamentally new approaches toward education provided for Masters of Education, together with fundamental training the formation of the basic and professional competencies is needed as well, the informational and communicative competency being of particular importance.

Problems connected with development of the informational and communicative competency within professional training of students of humanitarian branch of study have multiple-valued and multiple-aspect character; especially

taking into consideration that the university informational educational environment is being developed.

A.V. Vishnyakova in her research work "Educational Environment as Condition for Formation of the Informational and Communicative Competency of Students" (Vishnyakova, 2003) distinguishes criteria and levels of *informational and communicative* competency which include:

- expedient of activity;
- availability of rational methods and means of activity;
- distinctness of activity;
- consciousness concerning the process of development of informational and communicative competency;
- active position and independent work;
- critical mind.

As we consider communication as a non-verbal mechanism applying means of computer telecommunicate technologies we in our research speak about *informational and communicational* competency. Relying on the research carried out by S.V. Trishina and A.V. Khutorskoy (Khutorskoy, 2002; Trishina and Hutorskoy, 2004) in the field of content of general and specific knowledge in the educational standards; and the Standard of Secondary education for Information Technology and Informational and Communicative Technologies which contains the term *informational and communicative* competency described as "basic result of education", we believe that it is necessary to define more exactly the levels, parameters and characteristics of informational and communicative competency.

Informational and communicative competency, from the one side has general character, and from the other side it is a set of practical knowledge and skills for solving practical, vital problems; this set is combined of the general and professional educational results.

The authors of this article distinguish the following components of the informational and communicative environment: program and strategy, organization and administration, methodology, resources and information. Fig. 1 shows the content of the mentioned blocks (Saveljeva, 2004). We define masters, teachers and tutors-administrators as subjects of the academic process.

We understand the term "educational activity in the informational and educational environment" following I. Robert as "activity which provides conditions for interaction between students, teacher, means of teaching and means of information and telecommunication technologies which aims at reaching the educational goals" (Robert, 1994).

Development of the informational and communicative competency within the Master program in Education is impossible without creating conditions for students for mastering the individual methods, without understanding the limits for its application in their future professional activity. For solving these problems it is necessary to rely upon the innovative models and methods of education helping to form the basic and professional competencies.

Problems of learning new literacy by means of multimedia technologies are very urgent at present; it is connected with the necessity of creation a model of formation of informational and communicative competency for Masters of Education within informational educational university environment.

We will consider multimedia as a new means of literacy in the informational society in more detail. New literacy for the people of today is the search, critical analysis and productive application of information from different multimedia Internet-sources. In the modern world one should be able to create informational objects by means of different multimedia environments, work with computer models and hypermedia in the Internet.

Multimedia technologies and modern telecommunications allow creation of effective mechanisms of organization of communicative interaction of teacher and students in the interactive dialogue mode including educational

Components of the Informational Educational Environment

Program and strategy
— state standards
— course programs
— schedule
— forms and terms of reports

Organization and administration
— academic process timeline
— schedule of lessons, consultations
— electronic post, forum
— information board

Methodology
— theoretical materials
— laboratory works
— training
— tasks for independent study
— control questions
— tests for training and assessment

Resources and information
— electronic library
— subject catalogues of references for documents from the Internet
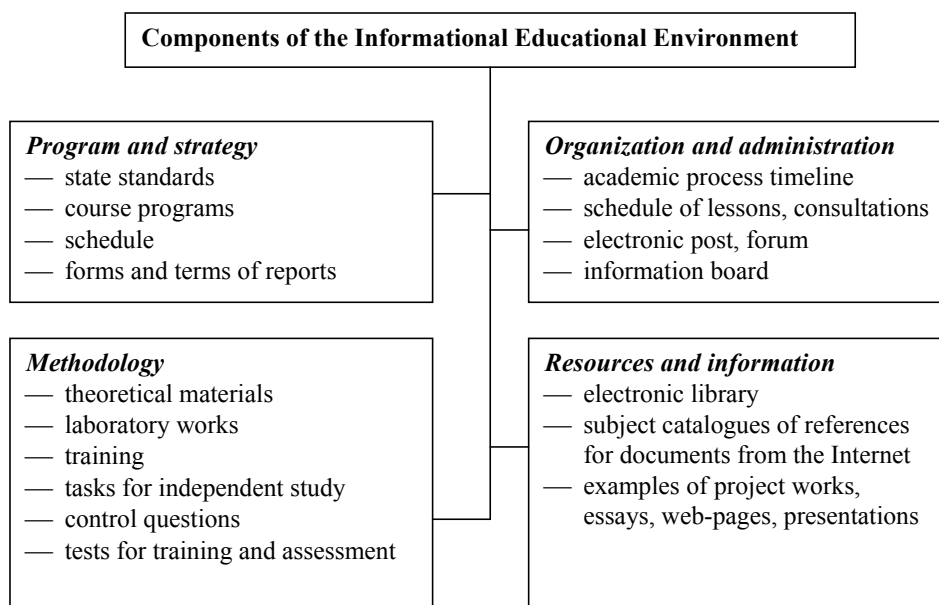— examples of project works, essays, web-pages, presentations

Fig. 1. Components of the Informational Educational Environment

group communications in the open informational educational university environment. Didactic functions which aim at development of the students' educational independence by means of research and project work are taken into consideration on the projecting stage of some multimedia products. Though experts admit that their application in the university collaborative learning environment is not completely systematic and consistent (Khutorskoy, 2002). These obstacles prevent making the formation of the informational and communicative competency systematic for students studying in accord with Master of Education programs, they do not allow to construct step-by-step process of development and use instruments to diagnose future teachers' progress. Thereby informational educational university environment acts as a tool and environment for development of the informational and communicative competency on the bases of multimedia technologies for students studying in accord with Master of Education program.

Accessibility of multimedia technologies not only as the object of study but as well as the means of education and a methodological and organizational tool in the multi-level education is used occasionally for effective formation of the informational and communicative competency for students studying in accord with Master of Education program. Network and interactive means of education including multimedia influence more and more considerably on the content of education and help realizing the ideas of open education and united educational environment.

The following two factors are very important for formation of competencies:

- occurrence of the process of acquiring the competencies, and it may become the biggest problem for the teacher aiming at formation of some competencies;

- permanent necessity to launch and organize this process (process of acquiring the competencies) in different situations.

I.D. Frumin states that for many training situations distinct predictability is characteristic. In every day life situations are full of several interrelated characteristics. The special features are not expressed vividly and they being not very distinct do not switch the necessary competency automatically. The person should define the important specific features himself and as a result get the necessary approach to the student and the pattern of the student's interaction with the outer world, taking into consideration the student's intentions (Frumin, 2002). Multimedia technologies to our opinion help modeling different training situations; they do not only allow forming the competency irrespective of the local resources available but also make it possible to answer the situation.

The importance of informational and communicative competency formation for future teachers is connected with informational and communicative nature of the educational process. Fig. 2. represents the scheme of informational communicative environment and marks certain personal areas and educational areas: informational area, area of psychological and pedogogical interaction, area of corporate communicative relations (Provorov and Smolyaninova, 2003). The suggested scheme will help defining the components of informational and communicative competency (for Masters of Education) and specific features of the competency development within the process of informatization of higher education.

We worked out the logic map of formation of the informational and communicative competency of a future teacher (Fig. 3) (Smolyaninova, 2002). *Communicative component* is connected with the teacher's activity in the educational environment made up by telecommunication network and
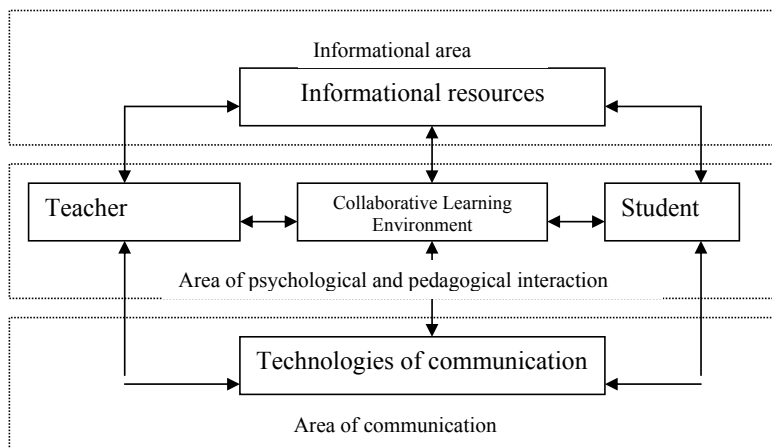
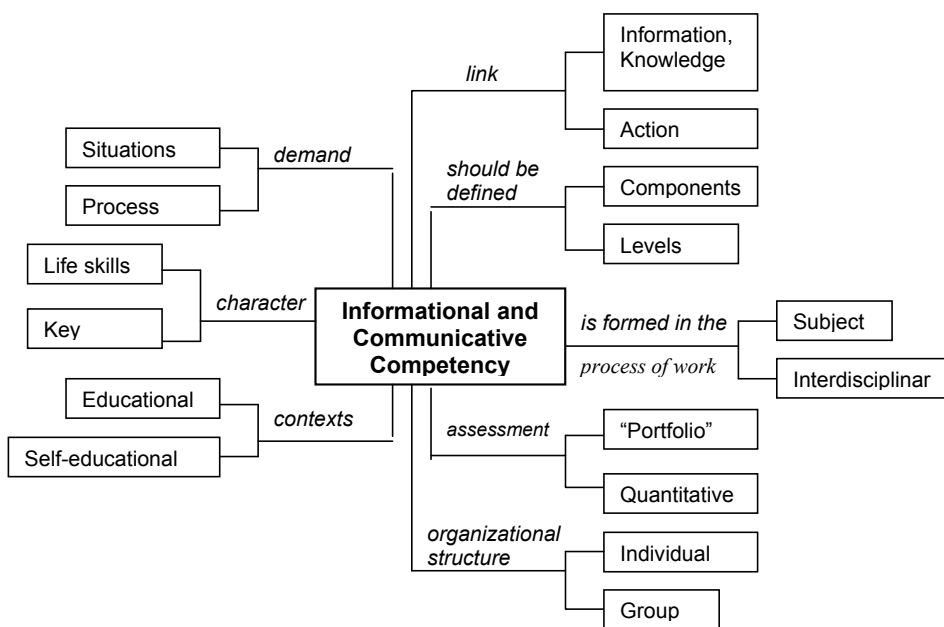Fig. 2. Educational Environment as Informational and Communicative Area

Fig. 3. Logic Map of Formation of Competencies

virtual reality environment. Application of telecommunication becomes more and more important nowadays in connection with their potential such as organizing distant learning, educational teleconferences, access to the remote databases, application of informational super dataways for getting educational and methodological information, analysis, distribution of the pedagogical experience and etc.

Gnostic component of the teacher work is closely connected with the *informational component*. It defines the activity of a teacher analyzing the possibility and the effectiveness of the new technologies application and different types of activity applying information technology means (informational and educational activity, research and experimental activity, control and self-control, training of skills, independent work on processing, obtaining and presenting

the information). Analyzing the available for educational purposes program means future teachers should be able to evaluate:

- psychological and pedagogical goals and the effectiveness of their application within the given educational model (development of thinking, formation of skills and abilities for educational activity and informational culture of students);

- level of interactivity (possibility of organizing the necessary dialogue interaction and availability of different means for the dialogue);

- possibility of realization of the "individual educational trajectories" (different levels of complexity for explaining the material available);

- possibility of establishing feedback (accept and give out variants of answers, possibility of analysis, diagnostics of mistakes and their correction);

- ergonomic level (quality of representation of the information, friendliness of interface, service quality, operation ability of access to the educational information, etc.);

- technical level (auto load available, reliability, etc.) of programs (Smolyaninova and Shishkanov, 2003).

Example

As an example of informational and communicative competency we will consider the case of realization of the described above model within the Higher Education Master program, a course of "Multimedia Technologies in Higher Education".

The authors believe that multimedia and hypermedia technologies are the basic means for realizing methodological system of higher education focused on the competency approach in educational and professional environment.

Within 2006-2007 academic year we launched the pilot credit-rating model of training for the students of the 1st year, Bachelor/Master programs in Education at Psychological and Pedagogical Department of the Siberian Federal University. Elements of competency approach were introduced into the system of professional training for students of humanitarian branch of study (psychologists, social pedagogues) on the basis of modeling method. This method allows to model situations of professional activity with the help of multimedia technologies.

The course program is worked out in accord with credit-module model and in consideration of the competency approach in education. Further we will dwell upon the grounds for choosing the credit-module model for the course.

Module based courses are more flexible than the traditional ones, they can be organized for different educational levels: full-time, part-time programs, second higher education program; for different level of mastering the material and different depth of studying the material. Module based courses allow to adjust the material to the individual needs of students, a student may run his own educational trajectory – this is individual approach. Credit-module system of the academic process organization widely being introduced now in Russia is based on the block-module principle; every component (subject, written course work, etc.) is given a certain amount of credits; it allows to make the rating scale and use this mechanism in the traditional system.

Having analyzed the Russian experience of the similar courses for Bachelors and Specialists construction we singed out the following contradictions:

- traditionally the constructed courses are supported by learning and methodological complexes which become out-of-date very fast notwithstanding the fact that

they in their turn are supported by the network resources;

- the traditional model of the course in "Multimedia Technologies in Higher Education" does not allow to construct flexible educational trajectories taking into consideration individual characteristics and educational needs of students.

That is why within the Master thesis research Bugrova M.M. worked out electronic version of the course "Multimedia Technologies in Higher Education" on the bases of our learning and methodological complex. It was worked out with the help of distant environment Moodle which provides students with the complete complex of electronic educational and methodological materials for the course and includs the students into the process of their progress assessment within the course in accord with the credit-rating model of education.

Here are the reasons for choosing the distant environment Moodle. At present there is no such system of distant education which could equally good correspond to the needs of different disciplines.

Firstly, Moodle is most optimal environment for developing a multimedia course which possesses a wide range of facilities for a full-grade realization of the academic process in the electronic environment including module approach, options for presenting and formation of the material to study, control of quality of education, communication and organizing the scientific society.

Secondly, this is the support of widespread standards and formats, big set of methodological instruments available, free technical support from the side of Web-site Moodle and the opportunity to develop the websites with multilanguage content.

The content of the course including the lecture materials, laboratory and independent works is realized in Moodle as follows:

- the principal teacher has full access to the course settings, including the other course teachers access;
- the choice of formats for studying the course, e.g. weekly format or thematic or some special format such as discussions may be also set by the teacher.

In the Moodle environment the course in "Multimedia Technologies in Higher Education" is divided into two modules for both full time and distant forms of education in accord with the academic program. Modules are logically complete and contain the description of the types of the educational activities to be undertaken by students for mastering the course. Except for this each module in accord with type of studying the material which is chosen by the student is divided into the set of system fragments of the distant course containing descriptions of: lecture topics, materials for control and assessment, workshops and seminars, tests for each module and the list of tasks for independent work is also included in the module with the detailed content description.

The content of each module includes the text of lecture, examples and problem-like tasks demanding creative approach from the students' side. The content of the module does not only help self-realization but also encourages the student to use his/her own experience. The module also contains links to the related demonstrations, questions and training tasks given in the other chapters of the course.

Within this our course the term "multimedia" is considered from informational and communicative aspects and as means for making education individual. The leading functions of multimedia programs are: explaining, communicative, heuristic, modeling, systematizing, motivating and developing.

The time needed for Masters of Education for developing a competency in multimedia application in education depends on the

Table 1. Module "Development of Educational Multimedia for Higher Education System"

Topics of the Module	Content
2.1. Development of Multimedia Products in the Tool Environments	Review of tool environments for development of educational multimedia. Tool multimedia-construction sets. Methods of realizing interactivity within different tool environments. Organizing and projecting of the presentation, author copy of multimedia application. Criteria for choosing multimedia programs for developing educational applications
2.2. Video Editing in Movie Maker Environment	Projecting of educational video clips. Reflexion
2.3. Electronic Portfolio in Education	Problems of organizing and criteria for quantitative and qualitative assessment of results of education in terms of competency approach carried out by students themselves
2.4. Portfolio of Scientific and Educational Achievements. Student's Self-presentation	Review of approaches, necessity, technologies of the portfolio development, assessment of the results of education with the help of portfolio

previous student's experience in the sphere of informational and communicative technologies, their motivation, ability to work independently and carry out research work.

Below there is the description of the module "Development of Educational Multimedia for Higher Education System" including the topics of the module and describing the content of lectures (Table 1).

Within studying the given Module the following competencies are formed:

Key competencies: create multimedia objects, work with hard copies of multimedia information, hardware and software.

Professional: carry out expertise of multimedia products, apply information and communicative technologies for solving professional problems of a teacher.

Special: interact with experts in different subject areas, use effective methods of information interchange in accord with the set goals.

Social and personal: develop ability to self-criticism and self-education.

Thus, within the Master of Education program of training the model of informational and communicative competency development on the bases of multimedia technologies and professional situations modeling within the informational educational university environment was probated.

Rezume

The authors consider that the modern approach to the problem of informational and communicative competency development in accord with the Master program in Education within informational educational university environment on the basis of multimedia technologies includes the following: the education is considered as self-development and self-perfection on the basis of the student's activity, diagnostics of competencies connecting with and self-analysis and reflection (Rechkova, Saveljeva and Turanova, 2007).

Student's e-portfolio, in the authors' opinion, may become modern technology of informational and communicative competency development, which includes electronic presentations of individual achievements, multimedia project presentations, course works and thesis and reflexive materials.

The authors worked out project of informational educational environment for organizing the academic process within the module based Masters' program of education,

it presupposes cooperation for realizing the educational technology. The work includes its principle structure, components, the content of the main blocks and its functional modes in the informational educational environment.

Further we suppose to work out methodological approaches for the actual practical work at the Institute of Education, Psychology and Sociology, Siberian Federal University and the Distant Technologies of Education Chair, Krasnoyarsk State Pedagogical University using informational educational environment http://idiso.kspu.ru and the further disseminate the results of our research work into the practical university professional training of Bachelors and Masters of humanitarian branch of study.

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