

Organizational and Pedagogical Conditions for Training Teachers Under Distance Education Framework

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Distance education in a professional higher school is of particular importance in terms of fundamental changes in modern educational institutions. This form of training together with the expansion of information technologies can effectively solve the problem of training students and life-long learning. Distance education is able to solve the problem of teacher training more effectively than any other method of education. In the same context, the opportunities of distance education to develop verbal and cognitive activities and information culture are considered. As a result of the use of network principles, the integrity of educational institutions can be effectively guaranteed and realized in continuity of principles and approaches to the management of different functional and territorial subsystems, and in the more distant future - its equitable integration into the world community.

Keywords: distance education, information technologies, information culture, information society

INTRODUCTION

Relevance of the subject

In recent years, there arose the need not only to consider the problem of distance learning organization in isolation in the tradition of mechanistic study of technical methods for its implementation, but to reveal its conceptual basis and reasonable

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limits of applicability of this form of training in order to address various educational tasks, and opportunities to optimize its combination with other ways of teaching. Perhaps, the emergence of a significant number of works on the problems of distance education (Davydov, 2004); methodological bases of distance learning (Vonk, 1996; Nughes & Newson, 1998; Laney, 1996); new information technologies in distance education (Khutorskoy, 2010; Fuchs, 1998), the role of distance education in the reform of the education system (Volov, 2000; Sekerci & Canpolat, 2014; Polat, 1996; Bilgin & Aykac, 2016; Robert, 2002; Yorulmaz, Altinkurt, & Yilmaz, 2015) is due to this need.

The analysis showed that even among the works published, one can hardly find papers devoted to distance training of humanities teachers, especially papers that identify suitable limits of applicability of this form of teaching. Moreover, the problems of meeting distance education curriculum requirements of Federal standard (GOST), teachers' academic hours calculating without real in-class hours, selecting optimal forms of current and final assessment of students in distance education to ensure the education quality control, the presentation of diplomas, regulation and control of students' credits are to be addressed (Kamalova, Korchagina & Bulatbaeva, 2016).

Problem statement

Changes in the structure of the modern economy require a different professional structure of the working population, a different distribution of a workforce of highly qualified specialists and consequently the expansion of distance education audience.

This also explains the urgent need for new professions such as social workers, school counselors, teachers of subjects newly introduced into school practice, teachers of additional education and others. (Khuziakhmetov & Nasibullov, 2012).

These circumstances highlight the urgent need for a more thorough research of the discussed problem from the new theoretical, methodological and practice-oriented perspectives based on many contradictions, the main, which is the contradiction between the need to develop and implement organizational and pedagogical conditions for the use of distance education in order to ensure the effective training of future teachers and the lack of theoretical developments on this issue.

The use of distance education in training future teachers is associated with a number of new problems related to the fact that specialists in this sphere should be taught not only the subject knowledge and skills, but also to form their communicative and rhetorical culture (Khuziakhmetov & Nasibullov, 2015). Here, the distance education is inferior to the traditional one by a number of reasons:

1. The lack of emotional contact, which is known to promote the assimilation process, deprives students with a strong motivation due to the need to communicate, express their views and opinions, exchange of certain results of mental activity between people, assimilated information, ideas, opinions, feelings and attitudes. It is obvious that by technical means alone this exchange cannot be organized in full. The communication, determining the nature and direction of educational relations, that is, "teacher - student" and "student - content of the training material - teacher" cannot be replaced by communication with a computer program.

2. The limited opportunities for forming speech culture, art of intonation, gestures, facial expressions that are inseparable part of teacher-student communication and that are incredibly important for specialists in "person-to-person" system (Klimov, 1998). This is particularly important in training teachers where communication is the main tool of the professional activity.

3. Focus on the technical means, the virtual environment. The constant focus on the screen, long immersion into the virtual world cannot but influence the internal state of the student.

4. The complexity of the development of personality-oriented training programs.

5. Students' unwillingness for full transition to self-regulation implying the manifestation of high responsibility and assimilation of large amount of information.

It follows that the use of advanced telecommunication networks under distance education framework allows the raising of the question of the necessity to create a special didactics and methodology of education as an integral part of the general pedagogy, as well as in the training of future teachers (Valeeva et al., 2016). Here, the search for new methodological orientations is associated with the comprehension of the interdependence of education as a cultural phenomenon, a social phenomenon and educational meta-system. Didactics of distance education should be based on a combination of general didactic meta-principles with specific ones, creatively interpreting them in the process of adaptation to the new teaching objectives.

METHODS

In the study, the following tasks were addressed:

1. to define the development of the problem of training future teachers under distance education framework in the philosophical, psychological and pedagogical literature;

2. to study the features of future teachers training under distance education framework.

3. to identify, justify and experimentally verify the organizational and pedagogical conditions of efficiency of training future teachers under distance education framework.

Tasks were addressed by the following methods:

- theoretical methods: the study and analysis of the philosophical, pedagogical and psychological science and methodical literature on future teachers training under distance education framework, synthesis, analogy, generalization of the study results;

- empirical methods: observation, pedagogical experiment (ascertaining and forming), the study of the experience of future teachers training under distance education framework, interviews, surveys of teachers and students;

- statistical analysis of the study results.

The research was done in the Institute of Psychology and Education and N.I. Lobachevsky Institute of Mathematics and Mechanics of Kazan (Volga Region) Federal University.

The study was conducted in three main successive stages:

At the first stage of the study the scientific and methodological literature was examined, definition of theoretical and methodological approaches to this problem, and development of the program of experimental work.

At the second stage of the study experimental work was carried out on the basis of which a working hypothesis (organizational and pedagogical conditions) was specified, development of a model of the process of future teachers training under distance education framework, conduction of testing of pedagogical tools that are implemented in this process, implementation of the primary processing of experimental data.

At the third stage of the study final systematization and processing of the data acquired and the results of the experiment was done, as well as continuation of their discussion and implementation.

In the present paper the following evaluation criteria were identified:

- the ability to work with primary sources and scientific literature;
- the ability to use the acquired theoretical knowledge to solve specific pedagogical objectives;
- the ability to analyze the impact of historical facts and events on the cultural and socio-economic development of the society;
- the ability to express one's own opinion on various pedagogical problems;
- mastery of specific historical analysis method of pedagogical facts and ideas;
- the ability to consider the pedagogical facts in the pedagogical relationship and interdependence, to select the most significant of them possibly close to one's future professional activity;
- possession of skills of critical approach to the analysis of pedagogical ideas and concepts.

Before starting the consideration of the pedagogical conditions, it should be noted that condition is a philosophical category expressing the attitude of the object to the surrounding phenomena, without which it cannot exist. The condition creates the environment in which the latter arises, exists and develops. There is a differentiation between necessary and sufficient conditions. Necessary conditions are conditions that occur every time when the action arises, whereas sufficient conditions are those that will certainly cause such action. Pedagogical conditions should serve to improve effective teaching and drive the objective opportunities of the content of educational material, methods and forms of teaching organization.

Instrumental definition of distance education can be formulated as follows: pen distance vocational education is a new form of lifelong multilevel education, built on the integration of educational, professional and social environments and the unity of teaching and organizational aspects of the functioning on the basis of a set of interrelated technologies ensuring consistent quality throughout the distance education network focused on the development of working professionals competence through the solution of urgent problems, particularly in the "person-person" system, and development of organizations through the development of personnel.

Experimental work during which there were tested organizational and pedagogical conditions of future teachers' distance education efficiency covered three stages.

1) *Ascertaining stage* during which the proficiency level of students taught by traditional and distance learning mode was determined.

2) *Formative stage* during which the work on introducing in the educational process organizational and pedagogical conditions of future teachers' distance education efficiency identified in the analysis was carried out.

3) *Final stage* during which the acquired level of students' proficiency in traditional and distance learning mode was determined, as well as comparison and statistically processing of the data obtained in the diagnostics.

Total research covered 186 people.

The aim of the experimental work was to improve students' professional level taught by traditional and distance modes through the introduction of conditions.

On the basis of the research objectives the following tasks of experimental work were formulated:

1. To determine the initial level of students' professional level taught by traditional and distance modes.

2. To study the effectiveness of the identified conditions of future teachers' distance education.

3. To monitor the proficiency level of students in the course of the experimental work.

At **the ascertaining stage** the control and experimental groups were identified. Besides, through the literature analysis techniques allowing the determination of

the level of students' professional training were identified. Check of the level of skills and knowledge formation was performed by specially designed tasks of different nature (tasks on articles analysis, peer reviewing of these articles, tasks on collation, etc.).

At **the formative stage** in the experimental groups of students of Kazan (Volga Region) Federal University the work on the introduction in the educational process of the future teachers' distance education efficiency identified in the analysis was carried out.

The key objective in establishing the system of distance education is the preparation and training of personnel. This need can be represented by the following directions:

- training of personnel responsible for the management of the system of distance education (administrative support of the educational process);
- training of personnel responsible for the organization and conduction of the educational process, namely, training of tutors, supervisors, teachers mastering educational technologies.

At the end of the experimental work on the implementation of the developed conditions, we conducted analytical data processing.

At **the final stage** of the experiment, students of control and experimental groups of Kazan (Volga Region) Federal University were tested once again for discovering the level of their proficiency. In control groups there were not found significant changes in the level of training.

Comparative characteristics of the formation of professional and pedagogical skills and knowledge of control and experimental groups showed significant changes in the following skills:

- the ability to consider the pedagogical facts in relationship and interdependence, to select the most significant of them, possibly close to their future professional activity: the control group (bachelors) - 51.2%, the experimental group - 64.5%;
- the ability to use the theoretical knowledge to solve specific pedagogical problems: the control group (bachelors) - 75.4%, the experimental group - 83.9%; the control group (Masters) - 54.2%, the experimental group - 68.4%;
- the ability to express their own opinions on various pedagogical problems: the control group (bachelors) - 66.4%, the experimental group - 77.4%; the control group (Masters) - 68.1%, the experimental group - 82.1%;
- mastery of specific historical analysis method of pedagogical facts and ideas: the control group (bachelors) - 51.2%, the experimental - group - 62.9%; the control group (Masters) - 41.2% of the experimental group - 57.9%.

On the other indicators minor changes in abilities and skills of control and experimental groups were observed. To give a more visible representation of the dynamics of the levels we have presented them in Figures 1 and 2.

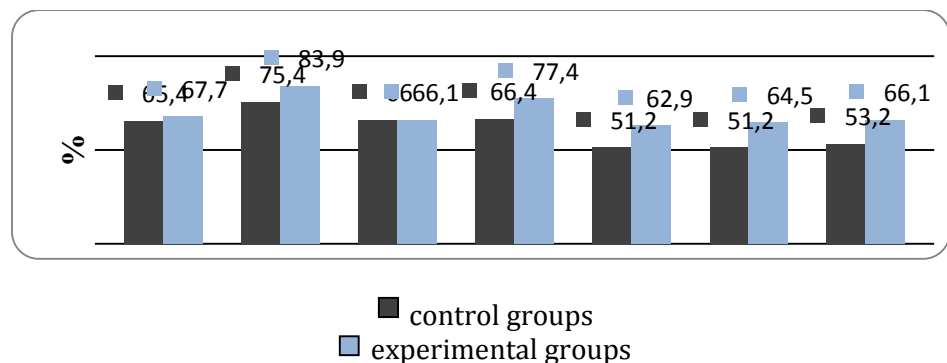


Figure 1. Dynamics of students' professional pedagogical skills formation in control and experimental groups (bachelors)

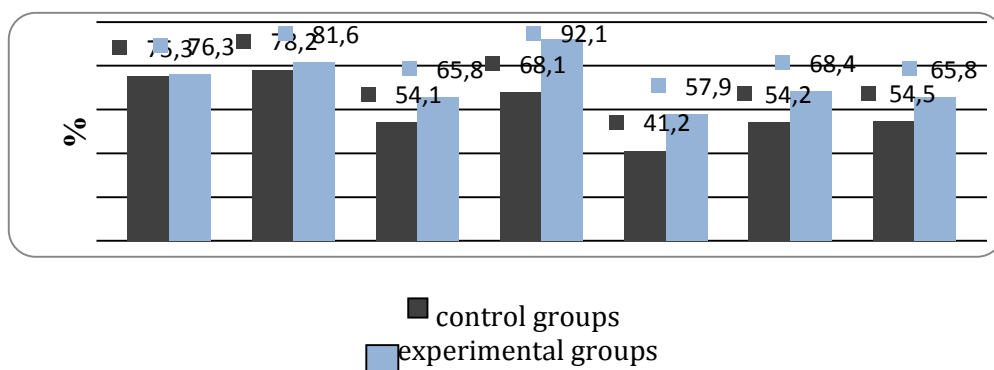


Figure 2. Dynamics of students' professional pedagogical skills formation in control and experimental groups (bachelors)

Comparative characteristics of the teacher's information culture formation in control and experimental groups also showed significant differences between them (Figure 3 and 4):

- the intention to use information technology in their future professional activities: control group (Bachelors) - 31.4%, the experimental group - 96.2%; the control group (Masters) - 32.5%, the experimental group - 97%;
- the intention to meet the requirements of the modern information society: the control groups (Bachelors) - 31.4%, the experimental groups - 100%; the control groups (Masters) - 87.5%, the experimental groups - 100%.
- the use of computer, Internet, e-mail and other means of information technologies in educational and everyday activities: control groups (Bachelors) - 18.2% of the experimental groups - 56.1%; the control groups (Masters) - 18.3%, the experimental groups - 57%;
- the master of information technologies and techniques: the control groups (Bachelors) - 17.4%, the experimental groups - 100%; the control groups (Masters) - 18.3%, the experimental groups - 100%.

Dynamics of information culture formation in all its indicators was observed in students enrolled in distance education, because in addition to professional and pedagogical knowledge and skills, distance learning equips students with computer skills, in telecommunications networks, and distance education techniques.

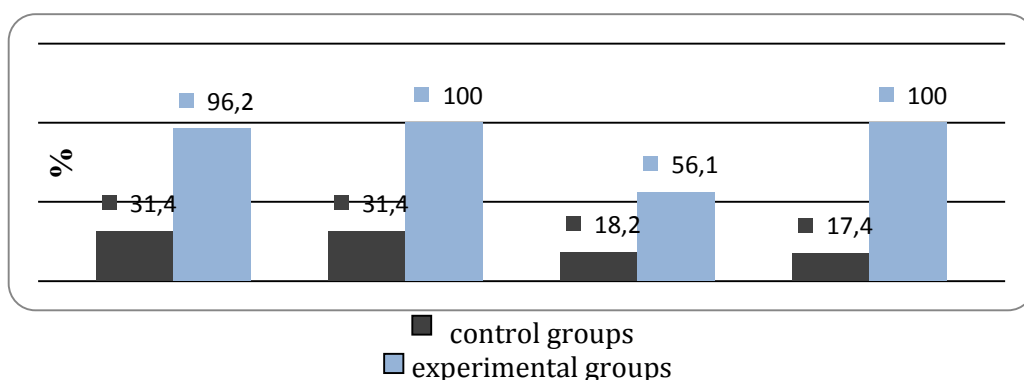


Figure 3. Students' information culture formation in the control and experimental groups (Bachelors)

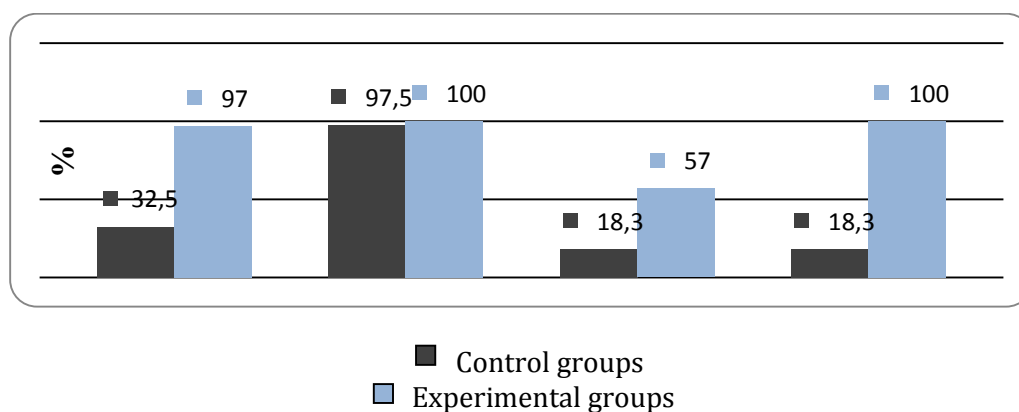


Figure 4. Students' information culture formation in the control and experimental groups (Masters)

The nature of difficulties in distance and traditional types of education showed significant differences as well. Students of traditional type of education faced difficulties mainly with the search of necessary literature, its analysis and synthesis, with the lack of time for its assimilation, lack of entertaining material, and the monotony of lectures and seminars. Students of distance type of education indicated that difficulty was caused by the novelty of a new training form ("constant communication not with the teacher but the computer"), self-training and the absence of a teacher makes learning difficult, the lack of computer skills, and the network also caused disorientation in most of students, however, all of these difficulties, as noted by the students themselves, were only at the initial stage of learning.

Despite these difficulties, students emphasize the following positive aspects of distance education as objectivity when evaluating the results, relative freedom in choice and the order of course material studying, training opportunities in the community, and others. Students also noted that they were able to master the technology and methodology of distance education, get computer skills and telecommunications networks, and others.

Analysis of students' professional training under distance education framework has shown the dynamics of students' basic pedagogical knowledge and skills formation, their focus on public information education space, as well as a desire to use computer and communication technologies in their future professional activities.

The final testing results of the experimental groups were compared with the test results of control groups, and it should be noted that teaching of foreign pedagogy history using traditional methods in control groups was of a theoretical character rather than the activity and was carried out based on traditional printing textbooks. There was no additional material in the traditional training. Results of control and experimental groups' analysis based on the final test are shown in Table 1.

Thus, control and experimental groups' analysis shows the positive changes in the quality of experimental groups' assimilated knowledge at each stage of learning. Changes in the quality of assimilated knowledge for each category of students in the control and experimental groups are shown in Figures 5 and 6.

Table 1. The results of final tests analysis in control and experimental groups

Students	Control group				Experimental group			
	«excellent»	«good»	«satisfactory»	«unsatisfactory»	«excellent»	«good»	«satisfactory»	«unsatisfactory»
Bachelors	7	22	31	2	11	40	11	no
Masters	4	13	20	1	10	19	9	no

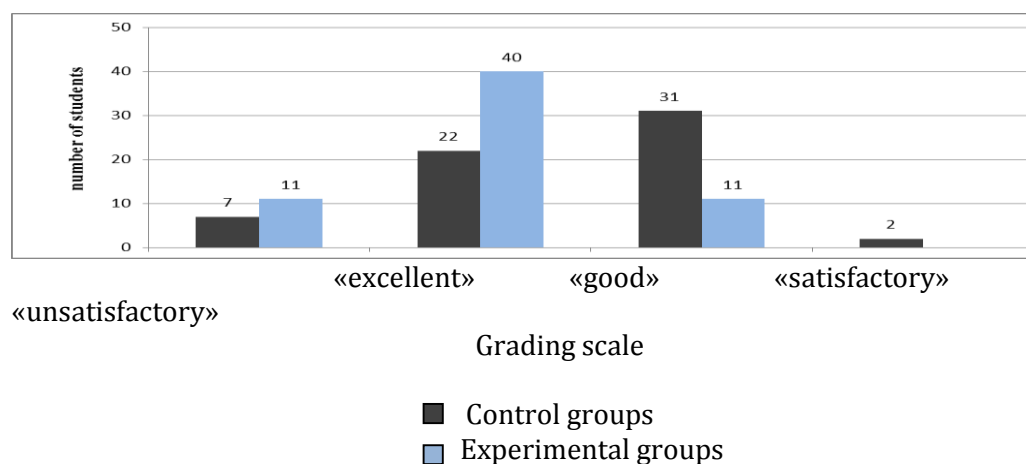


Figure 5. Dynamics of the final tests results in the control and experimental groups (Bachelors)

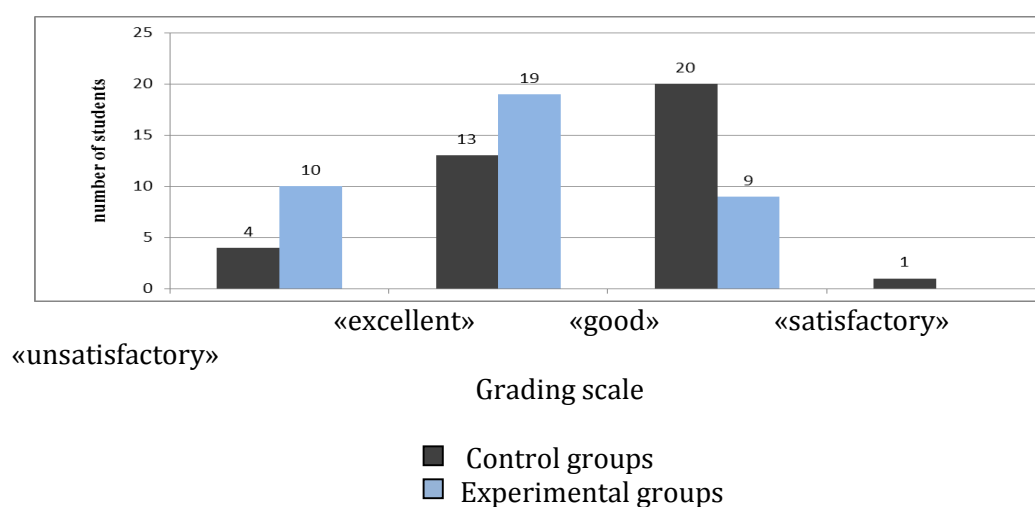


Figure 6. Dynamics of the final tests results in the control and experimental groups (Masters)

The data indicates positive changes of knowledge assimilation in the experimental groups. This fact is attributed to the content of e-learning, a variety of tasks that take into account the level of professional and scientific orientation.

Thus, under teacher organized pedagogically supporting and developing educational environment, student increment is important parameter of professional training. In the experimental work there has been confirmed a set of pedagogical conditions for promoting the future teachers' distance education effectiveness

The study has shown that in future teachers training to work in "person to person" system, specific methods of distance education harmonize with the organizational forms and methods of traditional training systems. In turn, these forms and methods are undergoing some changes, determining the specifics of their application, possibilities and the limitations imposed by the peculiarities of the profession, applicable in distance education resources, the nature of interaction between the trainer and trainee, as well as the selected areas by teacher or by the student model of educational interaction and the rate of progress.

As an example of the technological basis of organization of distance education model in higher educational institution, we present information and telecommunication educational technology (ITET), allowing autonomous support for training centers with significant information and library resources and provide

training using electronic learning (work) places of various types, which is implemented in Kazan Federal (Volga region) University.

ITET has the following advantages:

1. geographic autonomy (satellite communication can be installed at any point);
2. individual character of education through training terminals, allowing the use of one classroom for teaching a variety of training programs, educational paradigms (open education, lifelong education, education for all, education at home);
3. operational cheapness (the cost of rent for satellite channel is allocated to all branches, supplement of new branches does not increase the cost of rent).

The widespread use of information and telecommunications technology allows us to move to a new paradigm: "Education at home". Implementation of information and telecommunications educational technology is presented below:

The basic terminal is located in the head building of higher educational institution. The basic terminal is equipped with teleport for digital information transmission via satellite and high-capacity generic server, containing all the accumulated digital content, keeping educational records of all learners and all of the files, performing a number of functions in support of the administrative impact, accounting, mail, etc. According to the number of contained information generic server can be comparable to the largest libraries in the world.

Training Center Network - is a high-speed (100 Mbit / s) local network, comprising:

- **educational center terminal**, consisting of a receiving antenna and the consumer server. Standard hard disk capacity of the regional server is 120 GB, which corresponds to the information contained in about 60 thousand university textbooks;

- **fixed educational terminals** - educational space equipped with different types of e-learning technology for individual and group lessons on distance education technologies;

- **remote educational terminals**, which are personal computers of average modifications, placed outside of the educational center (at home, at the student's workplace, and so on) and designed to train students in the form of self-study;

- **educational communicators** are individual computer devices.

Information and telecommunication educational technology (ITET) enables the transfer of all digital content from the basic terminal via satellite communication channels to the terminals of educational centers. The structure of the digital content includes active and passive parts of the information resources bank (Figure 7).

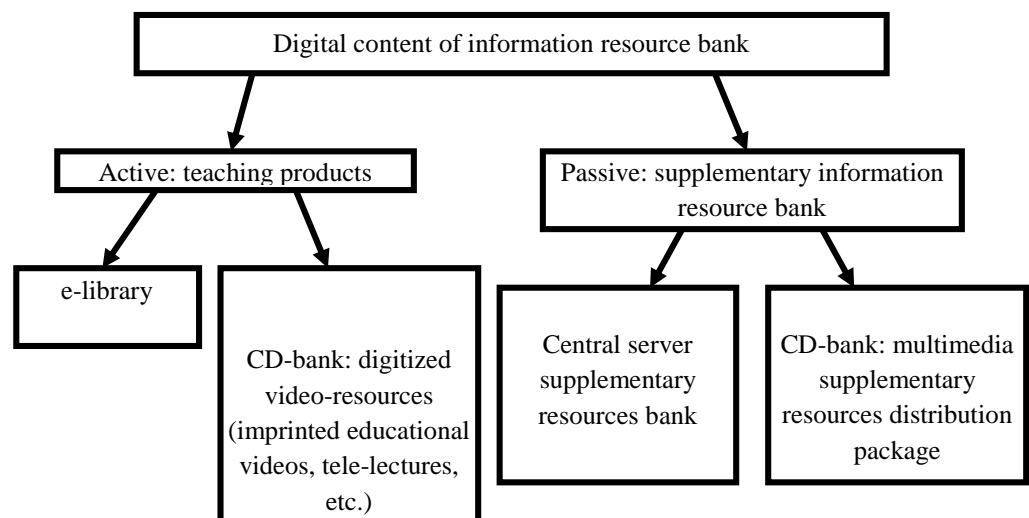


Figure 7. The structure of digital content

To ensure educational centers with ITET it is necessary to purchase and install specialized equipment. Head building of higher educational institution must have its own teleport and data transmission equipment. Educational centers should have equipment to receive and translate data during educational process; it's all about new educational center representation.

The idea of ITET is to create a unified network of electronic learning places for educational center students and staff, which is linked to the consumer server. Consumer regional server with hard drives memory of at least 120 GB is constantly being upgraded and updated with new digital content via satellite. Such memory space allows you to place a huge amount of information. For example, one medium size textbook (430 p.) occupies memory space of 2 MB, which means that server can host 60 000 medium size textbooks.

To ensure the teaching process with the use of information and communication technologies, the educational center realizes information and library resources prepared and transmitted by ITET, including educational, methodological and administrative documents.

Training facilities includes the following components:

- copyrighted teaching materials (videos, work books, computer training programs, slide lectures, tele-tutorials, collective training scenarios, test database of current and intermediate control, and others.);
- sets of textbooks recommended as basic and additional literature;
- monographs, articles, subject collections;
- digital information base (database of legal regulations, economic, etc.);
- reference books, encyclopedias, dictionaries;
- collection of periodicals (magazines, newspapers), fresh periodicals.

Educational resources, necessary for the study in this semester, are located (in digital form) in the electronic library, where access is open to any student both in the educational center and at home, taught with the help of remote educational terminal.

Methodological framework includes the following components:

- educational programs to create individual education plans;
- Funds of educational facilities use and training center equipment for realization for timetabling;
- individual learning profiles of students.

This information system and the database allow you to administer and control over the educational process, it covers all major pedagogical processes and provides information for making management decisions.

Administrative base includes the following components:

- enterprise standards, technological instructions;
- current orders, instructions;
- current reports, accounting, human resources, etc.

The server of each academic center is connected to satellite and data is transferred to it via satellite link from the central server. On the server of academic center, training materials update is conducted via satellite, fresh periodicals posting, replacing the old ones, the organization of new educational programs, educational materials supply on demand of each academic center. Actualization of materials and queries are permanent and instant.

The exchange of information between the basic and consumer servers are usually carried out automatically in two types:

1) according to the head university initiative there is the replacement of information blocks on consumer servers (for example, update of teaching materials once in all the academic centers);

2) on demand of academic centers there is the transfer of the information requested to one of the academic centers (for example, monographs student was interested in).

Server via local net is connected to all fixed educational terminals, which can provide any study material, tutorial, etc. contained in the server's memory. Thus, the teaching process in every academic center is no longer dependent on the scheduling of the head university and can be done on its own schedule, including individual timetables made separately for each student.

Modern education systems must ensure the development of students' competencies through the use of not abstract theoretical problems, but real practical problems. The ability to meet this requirement is a specific feature of distance education.

RESULTS

On the basis of the study there were developed and successfully implemented in the educational process of Kazan (Volga region) Federal University teaching materials, which were included in the curriculum of educational institutions teaching staff training, as well as future teachers training in distance education, which can be used in the practice of professional educational institutions of Russia and in the system of retraining and advanced training of teachers.

Incorporating the best features of traditional forms of education, and being the result of a large-scale society computerization, distance education has entered the XXI century. as its the fastest growing, humanistic and integral form. However, the introduction of distance education into the practice of higher educational institutions has gone the traditional route of advancing when the actions of the educational system are dictated by the wishes of the organizers, not the capabilities of the system. When the implementation is ahead of reflection and elaboration of elements of the system, the system does not work or produces the wrong product. Therefore, it can be argued that teaching practice can expect serious sweeping solutions to topical problems in the methodological support of distance education specialists training, particularly in the humanities, with high quality materials for productive work and training of students in general (Yarullin & Nasibullov, 2014).

The acuteness of the problem is associated with specialized training of subjects of the educational process. It is necessary to ensure facilitators' universal course training: coordinators, supervisors, teachers, tutors, teachers mastering educational technologies - with the aim of modern methods and technologies mastering, acquaintance with the peculiarities of distance learning programs. To train future teachers, it is necessary for teachers mastering educational technologies, in addition to the knowledge of the subject material, to have a broad knowledge in the field of education and psychology, including the psychology of interpersonal communication, the methodology of distance education and computer literacy. It is mandatory to introduce a "buffer", propaedeutic period, aimed at developing the necessary skills of trainees, first at least at the level of the user. Then the slogan of a 'single educational space' will become a reality.

In the future, distance education of future teachers will face the same problems as traditional contact education had, including additional, specific only to this type of teaching staff training. Many of these problems can be solved quite successfully using new approaches to student-centered learning, for which it is the system of distance education that provides greater opportunities than the traditional form of education.

DISCUSSIONS

The study of humanities oriented distance education, according to system approach in cooperation of its basic elements, analysis of its strengths and

weaknesses, which the developers of educational programs will need to consider or neutralize with the means found in further studies, leads in the long term to new problems emerging (Gabdrakhmanova & Egereva, 2012). The organization of educational process in distance education system should be improved qualitatively towards adequacy, functionality, openness and the number of viable options can grow and diversify, adapting to new demands and challenges of future teachers' training (Clarín, 1998).

As part of the prospective models it will become possible to carry out the work of students in the conditions of rigidly managed mode in a strictly defined framework of information and training program, as well as in the research mode performed in the conditions of work on group project or individual research.

CONCLUSIONS

The present research was conducted to identify opportunities to optimize the training of students in higher educational institutions on the major 44.03.05 Pedagogical Education (covering two training profiles), in which the use of distance education has its own specifics, is based on additional principles and requires compliance with non-traditional for other fields of activity terms of efficiency. The use in the educational process of information and telecommunication technology of training provides students with the individual choice of virtual operation with educational products, their study and assimilation in individual and group training forms. Academic mobility of students is realized in the system of open distance education that is carried out in the network form with its diverse productive relationships with educational unions, associations and contracts with Russian and foreign universities and educational centers. Students are encouraged to participate in various extracurricular programs. During basic training students can get vocational training in a number of areas of economic, legal, linguistic and other profiles in the "person-person" system.

The findings of the research can be used to develop specific legal documents on the optimal management of the process of distance education. This paper is intended for students of higher school and teachers for the further development of special courses for students, as well as for students of institutions of advanced training and retraining of educators.

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