International Journal for Quality Research 11(2) 379–396
ISSN 1800-6450

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E-LEARNING SYSTEM DEVELOPMENT IN ACCORDANCE WITH THE REQUIREMENTS OF EFQUEL: VYATKA STATE UNIVERSITY EXPERIENCE

Article info:
Received 07.10.2016
Accepted 06.02.2017

UDC – 37.018.43:004.738.5
DOI – 10.18421/IJQR11.02-09

Abstract: *The article is devoted to the study of various aspects of development and implementation of e-learning at higher education institutions. This system has been created according to the main approaches and criteria used by the European Foundation for quality assurance of e-learning (EFQUEL). The article presents the main results of the experiment on Vyatka State University's e-learning system development. The article reveals the feasibility of the development of e-learning in the region. The authors consider three main strategies of implementation of e-learning system at Vyatka State University. The authors substantiate the choice of the most effective and promising strategy of them based on the analysis and considering the peculiarities of the university and the region. In the article, the fundamental results of the experiment and description of the stages of the implementation of e-learning system are presented.*

Keywords: *E-learning, distant learning, quality of e-learning, quality assurance of e-learning*

1. Introduction

The basic task of higher education is to provide a possibility of getting quality education by student's choice of any offered variety of study programs, forms and methods of education at the university.

The need of education quality assessment in higher educational institutions has increased significantly in conditions of tightening competition among universities on national and international levels, of increasing demands for transparency and information openness of their activities (Pugach et al., 2015).

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E-learning is an innovative process with the usage of modern technical means, effective educational methods that makes the learning process to be clear, visually and accessible for everyone.

In accordance with article 16 of Federal law No. 273 dated December 29, 2012 "On education in the Russian Federation" the e-learning means the organization of the educational process using database information applied for implementation of study programs, information technology and technical tools for its processing, and telecommunication networks to provide an interaction between participants of educational process. The same Federal law defines distance education technologies as educational technologies implemented mainly the usage of information and

telecommunication networks in indirect (distance) interaction between students and teachers.

2. The state of art in the field of e-learning

The problem of development and implementation of e-learning systems in the work of universities is a complex. Scientists fulfill their investigations in various fields such as general pedagogy, special pedagogy, theory and methodology of training and education, theory and methodology of professional education, general psychology, psychology of personality, educational psychology, sociology of management, information systems and processes, computing and control, automation and control of technological processes, methods and systems of information protection, information security, telecom systems and computer networks, management in social and economic systems etc.

The study of scientific literature, publications and legal documents has allowed identifying the degree of elaboration of some aspects of the problem under study.

There are several theories and concepts of e-learning: a theory of "industrialization" (Peters, 1967), the theory of "autonomy and independence of e-learning" (Wedemeyer, 1974; Moore and Kearsley, 1996), the theory of "interaction and communication" (Bates, 1995; Holmberg, 1995).

The issues of state and prospects of development of e-learning in the system of continuous education are discussed in the works of Russian (Evdokimov, 2006; Moiseeva, 2000) and foreign (Bang and Dondi, 2000) scientists.

A number of authors (Garrison, 1998; Huisman, 2000; Lajos *et al.*, 2000; Marland, 1997; Mason, 1994; Nipper, 1989; Zeller, 1995) studied organizational, institutional and cultural issues of distance learning, psychological and pedagogical aspects of communication, economics and management of e-learning.

Another group of researchers (Ahmetova, 2009; Gustyr, 2001; Groves, 2009; Keegan, 1986; Chernilevsky, 2002) has investigated the issues of organization of continuous education, technological, technical and didactic support of e-learning in higher professional education.

Some scientific works (Bershadsky and Krayevsky, 1997; Borisova, 2001; Polat, 2001; Tikhomirov, 1999; Schennikov, 2001) are devoted to the problem of e-learning quality.

The analysis of scientific publications shows that empirical studies dominate over the theoretical.

A significant number of universities in different countries have experience in creation of e-learning systems.

The largest platforms for e-learning in the world are Chinese Teleuniversity (China), National Open University (India), Korean National Open University (Korea), University of South Africa (South Africa), Open University Sukhothai Tamarit (Thailand), Coursera (USA), National Platform of Open Education (Russia).

Theoretical studies are unsystematic and descriptive in terms of structure and organization of practical e-learning, a significant place still belongs to the aspects of development and description of the hardware and software.

Still there is a lack of legal documents regulating the educational process using distance technologies. There is no unified model of organization of e-learning process, so the universities have to solve arising practical problems independently.

Especially this problem is actual for regional educational institutions, which have not so perfect material and technical base and financial capacity as leading universities.

Educational institutions use following strategies for implementation of e-learning: minor local changes, modular changes and system changes.

In the first case, the innovation process is fragmentary, innovators know almost nothing about each other, and they do not exchange their experience. This strategy requires no serious investment from the university, as teachers-enthusiasts are able to support the implementation of new learning technologies on their own.

The second (modular) strategy is an intermediate variant of financial costs of institution, though it allows creating a very comfortable environment for the introduction and gradual deployment of a blended-learning system in all education forms. The main steps are as follows:

1) to create a minimum resource basis of e-learning and distance learning technologies implementation in one or two faculties;
2) realize e-learning and distance learning technologies within several study programs/ courses (pilot projects);
3) develop and test models for e-learning and distance learning technologies implementation in educational system of institution;
4) generalize the formed experience theoretically, to establish points of growth and development of the constructed models.

System implementation requires substantial investment and a lot of preparatory work on the creation of the resource base: legal, logistical, informational, motivational, personnel, etc.

3. Problem statement

Creation of own e-learning system is one of the competitive advantages for modern Russian universities.

E-learning is attractive for Russian citizens due to the following reasons:

- availability – possibility to apply to the studying information any time via open communication channels;
- flexibility – possibility to choose any convenient time, place and pace of studying by both teachers and students;
- modularity – possibility to create personal study programs and routes according to individual needs of students;
- multi – channeling and multithreading - the simultaneous addressing of a large number of students to different source of educational information (digital libraries, databases, electronic repository, etc.);
- taking into consideration individual characteristics and preferences;
- manageability - systematic quality control of education by providing immediate feedback and deferred checking forms;
- activity – focus on students' independent work, combination of independent educational activity with various forms of collective work with teachers and other students;
- interactivity – constant changing of information flow direction within the studying process from teachers to students as well as from students to teachers (Syrtsova and Tokmakova, 2009).

The process of creating VyatSU e-learning system has certain features that distinguish this system from others:

- the list of e-learning acting persons is expanded (to the traditional groups – teachers and students – we added another group of acting persons - organizers);
- the strategy of system development is building a dynamic system covering the entire educational organization;
- the modeling system is based on quality standards of EFQUEL and EQUASP.

4. Description of investigation

The implementation of e-learning and distance education is impossible without activities of different groups of acting persons (stakeholders).

If we consider e-learning and distance education as a special type of service that is made for the needs of people, the main acting persons entering into a relationship in this case are C***ustomer***, ***Contractor*** and ***Consumer*** of educational services.

The status of these parties is reflected in the order of the Ministry of education and science of the Russian Federation of 10 July 2003 No. 2994 "About the statement of approximate forms of the contract on rendering of paid educational services in General education".

A customer is a person (private or legal) interested in getting some results of a contractor's work or purchasing from seller any product. In this case a customer makes an order.

In a strict sense, the Civil code of the Russian Federation uses the term "customer" to a narrow set of transactions, the subject of which is execution of works or provision of services (but not the sale of goods):

1) construction contracts, including household contract, building contract, contract for accomplishment of design and prospecting works, contract for state needs (Chapter 37);
2) performance of research, developmental and technological works (Chapter 38);
3) compensatory provision of services (Chapter 39).

A customer of education services can be a government, different institutions, enterprises and individuals.

A contractor is an individual or legal entity creating any type of products or services. A contractor can be an educational institution or individual had a license to provide this type of service which is valid at the time of conclusion of the contract. A consumer is a citizen having intention to order or acquire, ordering, acquiring or using goods (works, services) exclusively for personal, family, household and other needs which are not connected with entrepreneurial activities. A consumer of educational services is a student.

The interaction of the parties of a chargeable services contract (except for educational services) is presented in figure 1.

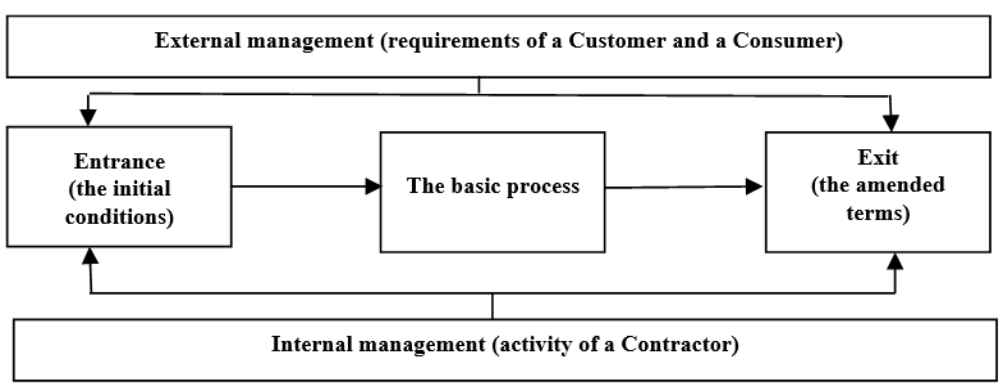

Figure 1. The process of service production

In the provision of educational services, the scheme of interaction of the parties has multiple features (Figure 2). At first glance they do not seem so significant but really the difference is fundamental. This is due to the fact that the essence of educational services

is that changes occur in the Consumer, he becomes a carrier of certain knowledge and skills, an owner of capacity purposefully generated. So a Consumer cannot be out of process of educational services rendering. He can't just purchase or buy any product.

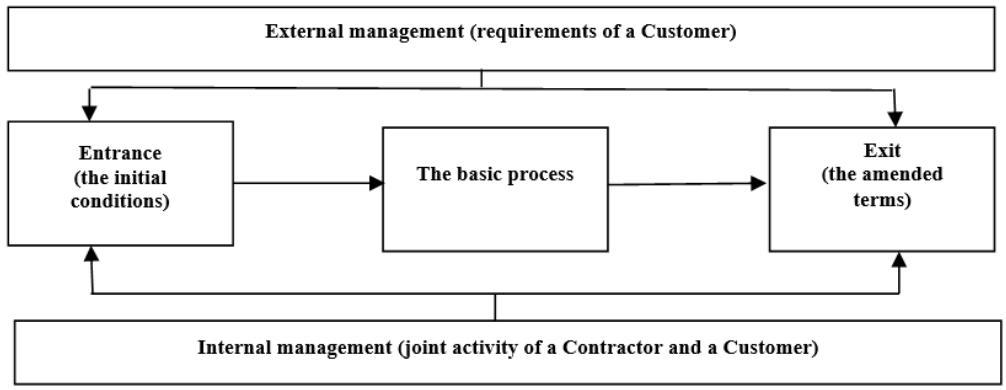

Figure 2. The process of educational services production

Amended exit terms of the process lie in a Consumer, they are his integral part. To obtain this result is impossible without the joint activity of a Contractor and a Consumer. Thus, both a Consumer and a Contractor are the stakeholders of the educational process. They are responsible for its quality and performance.

What it means to be an acting person?

An acting person (individual or a social group) is an initiator, creator, manager of object-practical activity and cognition, the source of activity directed to the object. This is a man in the set of such mental characteristics that allow him to carry out goal-setting and target-appropriate action, activities and behavior in common.

The main participants of the educational process are a teacher (in the role of a Contractor) and students (in the role of a Consumer). The activity of a teacher (teaching) is directed on solving the following main tasks:

1) organization of joint activities with students in setting and understanding the goals and objectives of learning;
2) introduction of new knowledge, facts, phenomena, events;
3) management of the process of awareness, acquisition of knowledge and development of skills;
4) management of the process of cognition of scientific regularities and laws;
5) management of the transition from theory to practice;
6) organization of heuristics and research activities of students;
7) control and assessment of educational outcomes.

In the process of learning in which the acting persons are students the new forms of behavior and activity are developed, new knowledge and regularities are absorbed on the basis of cognition and exercises. The activity of students in the learning process is directed:

- to create a positive motivation of learning;
- perception of new knowledge and development of new skills;
- analysis, synthesis, comparison, systematization of facts, phenomena, events studied;
- awareness of causal relationships;
- gaining skills in the process of exercises;

- independent solution of new problems;
- self-control, self-assessment of individual achievements.

The set of acting persons of e-learning process differs from the set of acting persons of an ordinary educational process. Among them there are teachers and students undoubtedly, but an important role in this work belongs to special organizers of e-learning process, which create the necessary framework for its implementation and further development.

So, the set of acting persons in the e-learning process are as follows:

- Organizers;
- Teachers;
- Students.

The first group consists of managers and tutors of academic groups.

In the table 1 you can see employees belonging to the category of organizers and their functions.

Table 1. Groups of participants and their functions

Group	Position	Functions
Managers	Top-management of the university Directors of branch institutions	They develop the strategic direction of a university's development, including the models of e-learning and distance learning implementation (system, modular, local)
	Directors of educational centres Deans and deputy deans	They analyze the readiness of structural units (educational centres, faculties, academic departments) for implementation of e-learning and distance educational process; recruit students, trainees; prepare orders about enroll, dropout and transfer of students of correspondence courses using distance learning technologies; prepare transcripts, diplomas, certificates and other mandatory documents; keep academic records. They are responsible for the admission examinations. They are responsible for all documentation referred to students' admission, their progression and attestation
	Head of Department of e-learning and distance education	He is responsible for the functioning and development of the system of e-learning and distance education in the university; organizes the work on e-learning and distance education; specifies the content, forms, methods and means of training; develop methodical and information materials for e-learning and distance education, supervises the process of preparation of curriculum, teaching and thematic plans and programs for the disciplines and courses in which implementation distance learning technologies are used; trains and coordinates the work of tutors, authors of teaching materials, faculty and staff engaged in e-learning and distance education
	Heads of academic departments	They distribute the teaching load for teachers; organize interim and final attestation, face-to-face consultations before exams; develop training and methodological support.

Table 1. Groups of participants and their functions (continued)

	Directors of geographically dispersed offices of the university	They accept documents from citizens who want to study by correspondence using distance learning technologies; form and transmit personal files in student personnel department; prepare draft orders about the contingent; provide consulting and organizational support for independent work of students which study with the use of case technology and network technology
Tutors of academic groups	Specialist in educational and methodical work	They interact with teachers, provide them with advice on issues of interaction with students; fulfill technical assistance in structuring the content of educational materials according to the requirements for using them in e-learning and distance learning process; keep records of working time of teachers; control the timeliness of filling of teachers' work documentation
	Assistant manager	They interact with students, conduct office-work, register incoming and outgoing documentation; prepare a schedule; maintain correspondence with students, record the receipt of students' abstracts, tests and coursework

The group of organizers of e-learning and distance learning process includes a significant number of employees of the university. They all perform various functions that together provide the possibility of efficient interaction of other participants in the process – teachers and students.

In the second group of acting persons of e-learning and distance learning process we include teachers which follow one of the three strategies in their activity:

- teachers-authors (prefer to provide the educational process with their own electronic teaching materials and other materials; they organize group seminars in the Internet rarely);
- teachers-tutors (prefer interact with students actively using various distance learning technologies);
- teachers-authors-tutors (prefer to create their own electronic teaching materials, manage independent work of students actively).

Functions of teachers participating in e-learning and distance learning process differ significantly from the activities of teachers not using e-learning and distance learning technologies. The results of the comparative analysis are presented in table 2.

Thus, the functions of the two groups of teachers overlap partly, but there are specific ones, which require special skills and a certain teacher's motivation and interest in their implementation.

In the second group of acting persons of e-learning and distance learning process we include such learners as:

- students;
- students of additional educational programs;
- applicants.

According to many researchers, the characteristics of learning and training, as well as the motivation of learning, in fact, reflect the subjectivity of the learner in his learning activity. We consider that subjectivity of a learner is a complex

integrated quality of the individual, which characterizes his activity and educational autonomy. The level of subjectivity in this case reflects the degree of subjectivity formation as the property of learner's activity and, consequently, the extent of teacher's assistance in implementing this activity.

Table 2. Teachers' functions

Functions of the teacher in e-learning and distance learning process	Functions of the teacher in traditional education process
1. Preparation of educational and methodical complexes and teaching materials on teaching disciplines	
2. Development of the content of lectures and seminars	
3. Maintenance of current documentation (individual plans of the teacher, recording in a work register, reports on educational, methodical and scientific work)	
4. Preparation of pedagogical measuring materials for the procedure of students' learning quality assessment	
5. The ongoing and final assessment	
6. Management of students' course and final qualifying works	
7. Conducting online lectures using web-cameras and webinar systems	7. Conducting lectures, seminars and practical classes
8. Creation of electronic teaching materials	8. Organizing and conducting of laboratory classes
9. Organization of online testing for students' learning quality assessment	9. Organizing and conducting of practical classes
10. Organization and conducting of problem forums and online consultation, working in chat rooms	
11. Individual correspondence with students	
12. Development of online instructions for students	
13. Organization of online laboratories	

We connect subjectivity with the manifestation of personal autonomy. Autonomy in the psychological sense is a social-psychological property that allows a person to act independently from internal and external requirements and demonstrate the ability to self-management, independence and conscious self-orientation. Autonomy is the need to reveal this property.

A person becomes autonomous when he is capable not to deny the natural expression of dependence but he can manage them by using the personal settings, i.e. to make a choice.

The autonomy of an individual reveals primarily in independent activity. There are some abilities, which characterize a person as a subject of independent activity:

1) Motivational and creative activity and orientation of a person. It reveals in curiosity, interest, sense of passion, emotions, aspiration to creative achievements, leadership, obtaining high rating, personal significance of creative activity, self-education.
2) Intellectual and logical. It reveals in the ability to analyze, to compare, to highlight the main facts, to describe phenomena, processes, to define, to explain, to prove, to justify, to systematize and categorize.

3) Intellectual and heuristic. These are abilities to generate ideas, to suggest hypotheses, to dream, to associate, to see contradictions, to transfer knowledge and skills in new situations, to overcome the inertia of thinking, to think independently and critically.
4) Self-management. It reveals in goal-setting and determination, in self-control, in the ability to plan, to organize oneself, to reflect and to correct, to be diligent.
5) Communicative. They are reveal in the ability to use other people's experience, to cooperate, to organize, to defend own point of view, to avoid conflicts.

In addition to these abilities the set of independent (autonomous) person's properties includes the philosophical properties (confidence, the ability to defend own creative position), moral properties (honesty, modesty, courage, determination), aesthetic properties (the ability to achieve harmony, simplicity and beauty of human relations), individual characteristics (rate of activity, performance, characteristics of the activity style).

From the point of pedagogical view the development of personal autonomy in education is closely connected with necessity of formation of cognitive activity, independence, initiative, responsibility, freedom of choice, skills of self-control, motivation to learn new knowledge and ways of action. In the traditional approach to the development of the education system, the main purpose is acquisition of knowledge but not development of ability to reveal creative independence in unusual situations. In the context of new educational paradigm it is necessary to form a new learning content which will develop not only knowledge (although it is compulsory), but creative thinking and ways of acting with new information.

It is particularly important that the student himself will be a subject of the process of goal-setting, self-defining objectives of his activity, asking problem questions and finding the answers. This is the essence of internal motivation, which is the base of autonomy of a person in educational process. A student as a subject of the educational process operating in the mode of autonomy is able to answer the following questions:

- What do I want to know? What do I want to learn?
- What do I need to succeed? How have I to organize my activity to achieve the result required?
- Where can I find the information I need in? What kind of information must it be?
- How to use my knowledge in new, unusual situations?
- How to check do the results received meet the goals?

Nobody can give a definite answer to these questions. Everyone is looking for his own answers, the way of new knowledge.

We are deeply convinced that only students who have the fourth or fifth level of subjectivity and who reveal educational autonomy can study with using e-learning and distance learning technologies. This is because a large amount of time the student must work independently and be able to find the information and organize his training process.

In addition to the organizers, teachers and students a variety of support services are involved in e-learning and distance learning process.

The structural units referred to this group perform auxiliary functions. They are not directly involved in the organization of implementing educational process, but they can facilitate its effective flow. The composition of this group of structural units and their functions are presented in the table 3.

Table 3. Structural units and their functions

Structural units	Functions
Law department	It checks compliance of normative documents with the current legislation of the Russian Federation, provides legal assistance in the preparation and proper filing of internal documents; participates in the preparation and conclusion of civil contracts with various counterparties
Department of educational and methodical work	It develops the content part and the order of implementation of the basic educational programs of secondary and higher professional education; analyzes, corrects and registers the curriculum, educational and methodical complexes; controls the implementation of the teaching load of different faculties; coordinates and monitors all types of students' attestation and progression
Department of economics and finance	It assists in the preparation of business plans; prepares estimates for all activities and study programs of the university; performs analysis and optimization of financial flows
Information and publicity Department	It fulfills market researches based on the analysis and forecasting of consumer demand and market conditions; organizes promotional events in the media; prepares promotional products
Department of information technologies	It updates technical base, introduces modern methods and means of information processing; organizes consultations on the application of modern information technologies; ensures continued access to local and global computer networks
Scientific library	It organizes differentiated service for users; provides basic library services; creates a system of electronic library catalogues

The table presents only the main structural units of the university that can provide assistance and support in the implementation of e-learning and distance learning process. The fact that the structure of the university is a dynamic system that is constantly changing it is impossible to determine the full composition of the subjects of e-learning and distance learning process. For each educational institution the set of acting subjects will be different but it will necessarily consist of organizers, teachers and students.

Accepting the necessity to solve this problem for meeting the customers' needs Vyatka State University has been conducting the experiment on the development and implementation of e-learning system since 2007.

E-learning at Vyatka State University today is a part of an innovative educational system towards the future, where the quality of education will be the main indicator. The form of access to the website for learning "at a convenient time, in a convenient location and through any resources" and the form of tutor and students' interaction in format "24/7" have to become commonplace. A wide range of training courses at our University makes e-learning process more flexible.

This allows, on the one hand, motivating different groups to get high-quality education, and on the other hand, preparing specific courses and educational programs while determining the target groups. The tendency of introducing e-learning into the practice of our University provides a good opportunity for our students to create their own educational route, to access a variety of educational programs and training courses.

E-learning gives students the opportunity to learn and to improve their professional qualification without interrupting their work,

to plan their study and work time. It is important for our university that it is comfortable and interesting for students to study here. Our teachers need special assistants to work with such categories of students. We have such professionals working with the students, which study with the use of e-learning and distant learning technologies. They are tutors of academic groups and tutors of educational programs. Each of them has special higher education and education in the field of pedagogy and psychology. These people help students to organize their studying process, to use principles of time-management, provide educational and psychological support, supervise students independent work on the educational portal, accompany students with disabilities in studying, work with students of so-called risk groups.

We have revealed the fact that procedures of e-learning and its outcomes monitoring are well-established at educational institutions but the process of qualitative results planning is not given sufficient attention. Monitoring is rather formal. Therefore, activities are aimed at eliminating the consequences and not the causes. It is necessary to understand the real causes of failure to ensure the stability of e-learning high quality obtaining. The need to work with the causes led us to the creation of techniques for risk groups identifying and tutor's supporting within e-learning. The correct diagnosis and the establishment of risk groups are very important as well as the quality of the immediate organization of tutor's support. We use two models: group work with students of a particular field of study and individual work with students from specific risk groups.

Students choosing e-learning and training with the usage of distant educational technologies can be divided into the following groups: those who have a special schedule of work; people finished school some years ago; mothers with little children; persons with disabilities; citizens caring for sick relatives and others.

Organization of independent work of each of these categories has its own characteristics. Knowing the category of the student, his typical problems you can determine the mechanism of his independent work supporting, the measure of tutor's helping. If tutor's work organizes well the student becomes successful at his study.

Understanding the need for educational process changing at the University has led to the search for new areas of development focused on the advanced generation of information educational space and the wide use of information and communication technology (ICT) in the University. The analysis of implemented software and technical solutions accomplished the separate information technologies, showed the necessity of the integration process, the rejection of some incompatible hardware and software and definition of common methodological and technological approaches. In this regard, it was decided to implement and develop further the e-learning and distance learning technologies in the University on *a program-targeted basis*. Vyatka State University implements the system strategy of introduction and gradual deployment of blended-learning.

Objectives of the Project Team were:

1) to determine the basic characteristics of the modeled system, which include requirements to its structure, its content and functionality;
2) identify the stages of development and implementation of the modeled system;
3) assess the functioning quality of created e-learning system.

Huge experience in e-learning, distance learning technologies, and techniques for evaluating their quality has been gain in international and especially European education.

To solve the first object we have analyzed existing approaches to development of e-Learning system and have selected the

model proposed by the European Foundation for quality in e-learning (EFQUEL) (UNIQUe, 2011). It includes a group of characteristics to be met for e-learning system in higher education institution: 1) educational policy; 2) educational resources; 3) educational process.

Each characteristic in its turn is divided into a system of indicators and in general it gives quite an objective assessment of current situation and identifies potential growth and development of the University in this direction.

After analyzing the above requirements to modeling system of e-learning and the availability of necessary resources at the University we came to the conclusion that the existing capacity is sufficient to create e-learning system based on the use of a system strategy.

To solve the second object the main stages of creating and implementing of e-learning system were determined.

Stage 1. Design of electronic educational environment (educational portal www.do-kirov.ru)

The term "information and educational environment" still has no clear definition. Despite the diversity of opinions in understanding of the essence of this term we can distinguish three of its essential features:

- information and educational environment includes the educational system and its ensuring subsystems: financial, logistical, marketing, regulatory and legal;
- information and educational environment has a hierarchy of methods for creating information resources and working with them;
- information and educational environment combines community of stakeholders distributed in the space and interested in interactive learning and teaching activities which have technical possibilities for such participation.

The methods of representation, dissemination and control of knowledge are formalized and included in the unified information educational space, which consists of virtual libraries, distributed databases, teaching materials with advanced didactic capacity.

Organization of informational and educational environment is focused:

- on information supporting educational process and its management;
- informing all participants of educational process about its progress and results.

An educational portal allows creating the software, telecommunication and educational space with the common technological means of conducting educational process in the Internet. Portal (main entrance, gate) is a holistic Internet address space that combines sophisticated services and information resources for a specific target audience

An information portal is a web system with a custom personalized interface for users to interact with each other, locate and use information resources needed. An educational information portal is a specially organized program and telecommunication educational space with the common technological means of conducting educational process in the Internet.

There are some ready software products intended for the organization of an educational information portal of e-learning and distance learning system. Among them are the specialized system Moodle, the Internet portal of open education Openet.ru, etc.

The lack of educational information portal developed for a specific educational institution leads to various problems in the organization of e-learning and distance learning process.

Russian educational institutions have experience of implementation of the

following specialized commercial products: "WebTutor", LMS "Prometheus", LMS e-Learning Server, Learn eXact, as well as ASP service Openet.ru based on IBM Lotus Workplace Collaborative Learning (LWCL).

We chose free software CMF Drupal to create an educational and information portal of VyatSU e-learning system meeting the requirements of EFQUEL in the field of e-learning quality assurance.

The main feature of CMF Drupal is the ability to work transparently with any objects making it easy to formalize them and to organize their storage and handling. This makes it easily extensible, and its possibilities are almost limitless. In particular, in Drupal you can easily create different types of content, display them, combine and output them in any convenient form using the visual interface.

Drupal also has a modular structure and admin interface clearly indicates the relationship between modules. All configures of them are in a special section. The standard Drupal distribution includes a sufficient set of functions for implementing administrative and information modules. The chat unit (Chat Room) and the unit for personal correspondence can be installed additionally to create a communications module. Creating a multimedia module will require the installation of Video and Audio units. You can also put convenient WYSIWYG editor BUEditor. The standard functions and unit Quiz implement a control module.

Moreover, the formation of a list of users, the individual file storage, the ability to create new content types and folders is available immediately after installing Drupal. For example, a new type of material *Assessment* with fields *Student*, *Discipline*, *Status of mark* allows you to organize e-gradebook which update will be implemented by the standard module of files import in CSV format. Similarly, you can organize lists of teachers and students with filtering, for example, faculty or year of receipt.

All the translations of the modules have been implemented by the project www.drupaler.ru and can freely be imported to the site. Russian Drupal community provides active support to newcomers and has a large base of solved problems.

Thus, Drupal allowed us to implement all the essential and additional functions necessary for creating information and educational environment of VystSU e-learning system.

The key functional features of informational educational environment for distance education include: online testing system; virtual exam audience; activities in the system webinars; activities in chat rooms and forums; videolectures; electronic library; internal system dispatch and accounting students; interactive schedule synchronized with electronic scheduling systems such as Google Calendar; electronic record book; electronic journal; system of internal correspondence; FAQ; glossary; rating system; survey system; instruction system; group projects, etc.

Virtual laboratory for teachers contains 4 special courses: Organization of e-learning; Technology of e-learning lessons; Electronic educational resources; Control and diagnostics in e-learning process.

In order to provide high-quality service it is necessary for the new service development process to be efficient and made up of methods and activities that can provide a general structure for successful planning and services development (Djordjevic et al., 2015).

In addition to realizing of basic study programs electronic educational environment allows to implement the following projects:

- "Open University" - a year-round realizing of public webinars on a range of subjects relevant to the region, professional communities and specific target groups; the usage of the service for consumers is free;

- "Virtual teachers' lab" – the resource for teaching pedagogical staff to work in VyatSU e-learning system; it allows to form such professional competences as: to conduct classes in chat and forum; to conduct webinars and conferences; to use video technology; to develop e-learning courses; to provide students with psycho-pedagogical and methodological support; to work with persons with disabilities others;
- "Distant contests" - the resource for implementing contests among schoolchildren and students using distance learning technologies in different study and research fields;
- "Integrated system of students' educational achievements" - the resource allows a comprehensive quality assessment of studying subjects included in a study program of higher education (bachelor, master, specialist);
- "Students' independent work" - the resource for teachers to organize independent work of students which study in the traditional system (not distant); it allows to use such forms as control, design, research, case studies and others.

The whole complex of web services of electronic educational environment is disposed in VyatSU superficialities cluster information system – supercomputer HPC HP Enigma X000 (HP Hewlett-Packard Cluster Platform 3000 BL460c, Xeon 5345 2.33GHz, Infiniband). Access to web services is carried out by local (corporate) network of the University, as well as through the Internet.

Stage 2. Pilot project of implementing 5 study program e-learning at two faculties of the University

For the pilot project were selected 2 faculties: the faculty of law and the faculty of economics and management. 90 people were accepted for training in 2012. The faculties started to realize 5 e-learning study programs:

1) 40.03.01 Law
2) 38.03.02 Management
3) 38.03.03 Personnel management
4) 38.03.01 Economy
5) 38.03.04 State and municipal management

The quality management practice is driven by the constant attainment of customer satisfaction through the continuous improvement of all organizational process (Rashmi Srinivas and Swamy, 2013). Therefore, consumers' opinion on the educational portal offered services convenience is constantly taken into consideration during the project implementation.

Stage 3. External quality evaluation of implementing e-learning at the University as part of the pilot project and elimination of drawbacks of the current model

In 2013 VyatSU e-learning quality was assessed by experts of the European Foundation for Quality in e-learning (EFQUEL). In November of 2013 Vyatka State University was issued a certificate of e-learning quality UNIQUe.

Stage 4. Extension of the experiment

In 2013 the number of programs increased to 11, the number of students was 500 people. Currently a set of e-learning in Vyatka State University is 43 study programs of higher education and 4 programs of secondary professional education. The number of students is more than 3,200 people (including people transferred from other universities and full-timed and correspondence form of education).

Bachelor's degree study programs:

09.03.03 Applied informatics
08.03.01 Civil engineering
37.03.01 Psychology
38.03.06 Trade business
38.03.05 Business informatics
38.03.04 State and municipal management.

Regional management
38.03.04 State and municipal management. Public administration
38.03.04 State and municipal management. Municipal administration
38.03.03 Personnel management
38.03.02 Management. Project management
38.03.02 Management. Financial management
38.03.01 Economy. Accounting, analysis and audit
38.03.01 Economy. Taxes and taxation
38.03.01 Economy. Finance and credit
38.03.01 Economy. Economy of enterprises and organizations
38.03.01 Economy. Banking
38.03.01 Economy. The world economy
38.03.01 Economy. Labor economics
38.03.01 Economy. Accounting, analysis and control of the state (municipal) institutions
39.03.03 Organization of work with young people
39.03.01 Sociology
40.03.01 Law. Civil law
40.03.01 Law. Criminal law
40.03.01 Law. State law
42.03.03 Publishing
42.03.01 Advertising and public relations
44.03.01 Education. Preschool education
44.03.01 Education. Primary education
44.03.01 Education. Project management in education

Master's degree study programs:
20.04.01 Technosphere safety
38.04.01 Economy
38.04.02 Management in education
38.04.02 Management in polymer industry
38.04.02 Management in the service sector
38.04.02 Management in the IT sector
38.04.02 Management in telecommunications
38.04.02 Management in civil engineering
38.04.02 Management in electrochemical industry
38.04.02 Management in the energy sector
38.04.02 Management in agriculture
38.04.08 Finance and credit
40.04.01 Law
44.04.01 Education

Study programs of secondary professional education:
21.02.05 Land and property relations
38.02.01 Economy and accounting
38.02.06 Finance
40.02.01 Legal and organization basis of social welfare

The bachelor's degree study program 08.03.01 Civil engineering which is realized with using e-learning and distance learning technologies was included in a set of study programs for the project EQUASP TEMPUS Project (543727-TEMPUS-1-2013-1-IT-TEMPUS-SMGR (2011-2503/001-001)). The main aim of EQUASP project is to promote the improvement of the quality of technological study programs through the adoption of internal quality assurance systems focused on the definition of learning outcomes and the definition and implementation of an online documentation and monitoring system of the quality of study programs consistent with the Standards and Guidelines for Quality Assurance in the European Higher Education Area. The experiment is successfully completed in 2016.

5. Conclusions

The results indicate that the selected at the University model of e-learning system is optimal and allows implementing a wide range of educational services and innovative projects.

A set of perspective directions of e-learning development at Vyatka State University includes the following:

1) realization of technical study programs by means of e-learning (electrical and power engineering, construction and others);
2) usage of e-learning technologies in the sphere of additional professional education;

3) development of special study programs to improve Russian language communicative competence of foreign students;
4) information technology support of the process of research outcomes commercialization.

The main directions for further researches are:

- development and approbation of the development and approbation of the model of online courses quality assessment;
- development of models and definition of terms of e-learning technologies implementation for full-time study programs;
- development and testing methods and means of VyatSU educational portal integration with the National Platform of Open Education (Russia);
- development of technology of universities' interaction within the National Platform of Open Education (Russia).

In the modern world, where technologies are developing constantly, you need continuous development and improvement to stay on the top. The educational sector is no exception. Vyatka State University always actively develops the most modern educational technologies. E-learning and distant educational technologies are one of the priority directions of innovation at our University. We believe that it is a modern and effective way of getting a good education.

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