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Assessment of consumers satisfaction by quality of information telecommunication educational technologies

In article the system of estimation containing a method of an assessment and the corresponding questionnaire, is developed for determination of satisfaction of consumers. The assessment of quality of information and telecommunication educational technologies is defined on the basis of processing of results of questioning.

Key words: educational information and telecommunication technologies, assessment of consumers satisfaction, a method of an assessment, anonymous survey, electronic educational resources.

The modern education system uses information technologies and computer telecommunications more actively. The education system that promoted especially dynamically by a number of factors, and first of all — equipment of educational institutions by the powerful computer equipment and development of community of the Internet develops.

Information technology — this is another marketing channel. It is necessary to know their opportunities and laws and to apply to destination. It is necessary to try, it is necessary to set real tasks and to apply appropriate means.

Thus, innovative learning technologies have a number of good points as adaptability, mobility, democracy, and the end result of improving the quality of education.

Use of information and telecommunication technologies gives the chance to build extremely favorably for the user an individual trajectory of training. Student can personally specify the time and sequence of study subjects, as well as the students are given several opportunities to perform laboratory work to realize practical tasks that actually it is impossible. Essential also is that application of information and telecommunication technologies in training gives the chance to the student to carry out at distance communication with the teacher in time convenient for, applying for this purpose a forum, a chat, e-mail [1].

Use of technologies allows the teacher always update the content of education; to carry out any kind of occupation, also to realize control and self-checking of results of students educational activity.

In parallel with the benefits of information and telecommunication technologies and their use in many universities of our country has a lot of problems, such as, first, inadequate resourcing and weak material and technical equipment of the schools; Second, as noted I.V.Popova and V.I.Zhiltsova, insufficient didactic component of electronic educational resources determines that no technological approach to learning in many distance learning courses, besides the direction of the educational process mainly on the reproductive nature of the activity [2]. It is possible to call one more of burning issues of higher education institutions is a weak level of information competences of the teachers, not allowing them actively and productively to apply in educational process of information and telecommunication technologies. A significant problem is the lack of a comprehensive evaluation system and criteria developed quality of electronic educational resources.

To solve this problem it is necessary to evaluate the electronic educational resources for these resources to develop a simplified method costs, the cost of equipment such as computer classes, Internet connection and installation of furniture, salary staff (teaching, administration, repairs, utilities, office supplies, etc.).

Anonymous survey gives the chance to be guided most strictly to the conceived plan of research because «the question-answer» procedure is strictly regulated.

On the basis of a method of questioning it is possible to receive high level of mass character of research with the smallest expenses. Anonymity is a feature of this method (the personality of the student is not declared, only registered his answers). Questioning is used to determine consumers' opinions on certain issues, and to cover a significant number of consumers for a minimum period.

The pioneer of application of the questionnaire in psychological research is F. Galton [3] who in the research of influence of heredity and on level of intellectual achievements by means of the questionnaire interrogated Wednesdays one hundred the largest British scientists. Anonymous survey takes place so that the respondent fills out a questionnaire in the presence of interviewers or without interviewers sometimes fills out a questionnaire with the words of reading.

Anonymous survey can be individual or group, when the minimum term for the greatest possible to interview number of people. Anonymous survey can also be full-time or part-time — as a postal survey; survey through the newspaper, a magazine, a computer network.

Questionnaire is the main means of survey and plays the role of a sociological document containing structurally organized set of questions, each of which is associated with the objectives of conducted research. This communication is expressed in need of obtaining information reflecting characteristics of studied object.

It is expedient to develop a questionnaire for an anonymous survey of all courses students, i.e. assess customer satisfaction with educational information and telecommunication technologies.

Object of research: A survey.

Subject of research: Conduct an anonymous survey of different courses students.

Purpose: Assessment of consumer's quality satisfaction of information and telecommunication educational technologies.

Results of work: To determine customer satisfaction assessment developed evaluation system, comprising evaluation method and corresponding profile.

The assessment of quality of information and telecommunication educational technologies is defined on the basis of processing of results of questioning.

The offered method of quality assessment of the information and telecommunication educational technologies, including questioning and an assessment of the received results, gives the chance to receive the fullest information for the subsequent analysis.

Questionnaire examples for students of various courses which can be filled as on the end of training, and step by step in the course of training.

Questionnaire A (anonymous survey)

For scientific research on problems of effective use the Internet of resources in training process of Karaganda state university students we ask you to answer questionnaire

_____ Age Sex _____ Student course _____

№	QUESTIONS	ANSWERS		
		Always	Occasionally	Not use
1	Do you use Internet sites of an educational profile in the course of preparation for occupations?			
2	Do you use services of the Media library of our university in the course of preparation for occupations?			
3	Do you have lessons in computer classes with use of specialized programs?			
4	Do you consider that training of information technologies corresponds to your desires?			
5	Are you satisfied with the material and technical equipment of the university to increase your knowledge in information technology?			

Questionnaire B (anonymous survey)

In order to assess customer satisfaction with educational information and telecommunication technologies in the educational process of Karaganda State University students ask you to answer the questionnaire

_____ Age Sex _____ Student course _____

№	QUESTIONS	ANSWERS				
		Yes, fully	Rather yes, than not	I can not say	Rather no than yes	No
1	In what measure your information requirements satisfy these sources of scientific information and channels of its receipt?					
2	Are using of information technology resources and significantly improves the effectiveness of the learning process?					
3	Does your level of computers and other office equipment (at faculty, chair) meets your requirements?					
4	In what measure your requirements satisfy possibility of a local network of university?					
5	In what measure do you estimate the skills of work with modern information technologies and resources?					

Method of questioning results assessment.

The method of questioning results assessment provides:

1. Processing and formalization of received information on results of questioning.
2. Application of methods of the statistical analysis for an assessment of results.
3. Summing up, justification of conclusions and development of recommendations.

For the analysis of the survey results and graphical methods are used, the correlation — regression analysis, the method of grouping, ranking method. It is also assumed maintenance of a database of survey results, after which it will be convenient to assess the structure and intensity changes of quality evaluation using indicators derived from comparing levels.

Developed questionnaire for students includes 5 questions. *A* questionnaire was developed for purposes of scientific research on the effective use of Internet resources in the learning process of Karaganda State University students and *B* questionnaire designed to assess customer satisfaction with quality educational information and telecommunication technologies in the educational process of Karaganda State University students. Questioned students *A* are offered to answer on the questionnaire on questions as follows: in columns is «Always», «Occasionally» or «Not use» to put respectively the sign «+».

At the answer to *B* questionnaire it is offered to answer thus: in the columns «Yes, fully», «Rather yes, than not», «I can not say», «Rather no, than yes» or «No» to put respectively the sign «+».

In the analysis of questioning results the answers typed on all questions are separately summarized. On the basis of the received results the level of efficiency quality of use the Internet resources in educational process, and as an assessment of consumers satisfaction is defined by quality of information and telecommunication educational technologies.

According to the results of *A* questionnaire survey if all the answers are «Always», the effectiveness of using Internet resources will be highly appreciated. If all answers are «Occasionally» is recorded as satisfactory. If the answer is «Not use», the effectiveness of a low fixed.

According to the results of *B* questionnaire survey if the number of positive responses is 4 or more, the customer satisfaction is highly appreciated. If this amount is less than four but greater than or equal to 2, is recorded as satisfactory. If the amount is less than 2 positive responses, the estimated low.

Results allow us to make adjustments in the activities of the University in the educational process, as well as motivate the leadership of the institution to increase its efficiency.

Results of an anonymous survey will also be the basis for the creation of customer satisfaction database that enables more thorough and timely pay attention to changing conditions and requirements of the time.

Consequently, the developed questionnaire and method of questioning assessing results of students opportunities to improve the quality of training as teachers (through the analysis of the level of competence) and students (through the analysis of satisfaction with the quality).

To carry out activities aimed at enhancing customer satisfaction, it should be noted that on the first note. For this purpose it is possible to characterize the data. Of course, the quality of service indicators, which came in a span of 1–2 «+» require the development of measures for improvement. And if the results appear

to the assessment of consumers below 3 «+», then it is even more priority areas for improvement, as they mean customer dissatisfaction.

For sure, in many cases the benefits of the survey of consumers depends on the issues that are included in the questionnaire. To check the quality of profiles, better complete profile key question: «With the help of our products or services are you satisfied with your needs» If the results of the questionnaire data show that a high level of customer satisfaction and value calculated only according to the latest issue is low, then the questionnaire don't enable us to obtain true information about customer satisfaction and questions should be worded differently.

In these questionnaires, as usual, it is impossible to include all the questions (or a lot), which could give an opportunity to assess customer satisfaction by how full service product meets their requirements. Of course, consumers appreciate not only functional aspects of quality, such as customer satisfaction evaluation of educational services, which include the following information resources:

1. The knowledge, professional experience and tradition of training teachers of the university, as well as the service staff.
2. Information culture of the teacher, ability to form it at students.
3. Financially — technical equipment of university.
4. The possibility of acquiring a new fleet of computer-assisted learning (laptops, monitors, computer cases, keyboards, web — cameras, scanners, mouse, printers, etc.).
5. Software (entry system to the Internet, office, entrance to the social network of the Internet and computer engineering from the Macintosh, Microsoft, Apple, etc.).
6. Availability network at the university to expand into a regional network, the ability to communicate with the management of the university teachers and students.
7. Prepare a plan scenario for videoconferences, training and examinations using presentations.
8. Scientific conferences using videoconferences.
9. Educating students through electronic and remote technologies, as well as training students using personal information trajectory.

As a result of work done would like to offer the following most significant solutions to these problems. First, you must enable and promote State-level institutions and universities that are engaged in the development and implementation of information and communication technologies in education. Second, the development of electronic educational resources must be implemented on the basis of requirements for technologically organized learning. Contents of electronic educational resources should be aimed at different levels of study of the discipline (reproductive, algorithmic and heuristic, research). Problem that is associated with a weak level of information competencies worked out of high school teachers, can be solved through training programs by university employees holding information and telecommunication technologies. A problem of complex evaluation of electronic educational resources, it must be implemented taking into account pedagogical and psychological demands.

A decision aforementioned problem of information and telecommunication technologies gives opportunity to take education to a new level. Management of the organization should be applied to measure the degree of customer satisfaction as a vital tool. It should also organize the process of requesting information, measuring and monitoring feedback on customer satisfaction, that it provide information continuously. In such cases, should be considered compliance, meeting the needs and expectations of customers, as well as price and terms of delivery of goods.

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Тұтынушылардың ақпараттық-телекоммуникациялық білім технологиялары сапасымен қанағаттандырылуын бағалау

Мақалада тұтынушылардың қанағаттандырылуын анықтайтын бағалау әдісі мен сәйкес сауалнамадан құралған бағалау жүйесі келтірілген. Ақпараттық-телекоммуникациялық білім технологияларының сапасын бағалау сауалнамалардың нәтижелерінің негізінде анықталған.

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Оценка удовлетворенности потребителей качеством информационно-телекоммуникационных образовательных технологий

В статье разработана система оценивания, содержащая метод оценки и соответствующую анкету для определения удовлетворенности потребителей. Оценка качества информационно-телекоммуникационных образовательных технологий определяется на основе обработки результатов анкетирования.

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Numerical solution of initial-boundary problem for the Helmholtz equation on «discretization – optimization»

In this paper we consider the solution of inverse problems on a «discretization — optimization». Considering the direct problem in discrete form, we calculate the functional gradient in a discrete form, using the formula for summation by parts, we obtain the formulation of the conjugate problem in discrete form. Construct an algorithm for solving the inverse problem. Numerically solve the inverse problem. And also performed numerical calculations for the solution of inverse problems.

Key words: numerical solution, initial-boundary problem, discretization – optimization, Helmholtz equation, inverse problem, Landweber iteration method.

Introduction

In this paper [1] considered the Cauchy problem for the Helmholtz equation, the authors present the theoretical research of the problem. Solution of the problem is considered scheme «optimization – discretization». Initial problem is reduced to the inverse problem, which is written in operator form. Operator equation reduces to the problem of minimizing the objective functional. We write the functional gradient.