

## **Influence of Technologies on Quality of Distance Learning**

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### **Introduction**

The information technologies (IT) used in learning make influence on the learning process and change it providing with new forms and opportunities and improving the quality of learning. In analyzing the modern learning, a big attention is paid to its quality. However, an analysis of literature shows that there is no agreement as to this conception.

Learning is a process that is permanently changing. That is why the assurance of education quality is a complicated phenomenon influenced by different factors.

Distant learning is being developed in two directions:

- IT are used to improve traditional learning methods as much as possible,
- new distant learning methods are created which can be used only with IT.

Consequently, IT plays a double role. On the one hand they enable us to use traditional methods of studies in distant learning; and on the other hand, IT let us create new efficient methods of learning which would be impossible without IT.

In distant learning a problem of the quality of studies is raising anew.

The *aim* of this paper is to review a current conception of quality of education and analyze the IT influence on the quality of distance learning. The *subject* of the research is a modern process of distance learning influenced by IT at a level of individual activities and a subject of studies.

### **General definitions of quality**

In many spheres of activities quality is a goal to be reached but often it is defined in a different way.

Striving for quality in the environment of competition is permanent as the understanding and at the same time requirements for quality are constantly changing thus

influencing success on the market. The originator of the theory of quality Deming stressed the universality of quality: striving for quality should happen in all the links of the process; it should be continuously improved in order to find interior and exterior reserves and opportunities. The quality system is a “network of interdependent components that work together to try to accomplish the aim of the system” [1].

Quality descriptions and definitions were analyzed according to national and foreign publications [2] and presented in this article: “quality – feature, value, degree of suitability and correspondence“. It is also claimed that quality is a degree of correspondence to standards [3].

ISO 9000:2000 [4] gives the following definition of quality: “Quality is determined by comparing a set of inherent characteristics with a set of requirements. If those inherent characteristics meet all requirements, high or excellent quality is achieved. Quality assurance – is a sequence of activities in order to make sure that the requirements for quality are fulfilled”.

### **Conception of quality of studies**

The attention to quality of education increased when higher education became a mass phenomenon. However, striving for quality and its assessment in higher education is problematic as institutions of education have certain peculiarities. It is more difficult to define goals of institutions of education than those of industry or business, and it is more complicated to determine whether the goals of education have been reached. What is more, the activities of the institutions of education are difficult to assess.

The most important feature of the modern higher education – mass attendance – is in conflict with the principles of quality as it is directed towards the user, i.e. an individual. In order to achieve better results, we should strive to an opposite process: not to increase mass

attendance but adjust learning to an individual. Consequently, we face a problem of resources.

It is supposed [2] that the quality of studies is the appropriateness of the conditions provided for the development of person's self-education and acquisition of qualification at a university.

Article [5] notes that different quality models are implemented by educational institutions: general quality models adjusted to institutions of education (e.g. ISO 9000:2000 (*International Organization for Standardization*, 2000), EFQM (2003)), or specific models of learning and education areas from education quality management systems (*BLA*, 2005) to the criteria for creation teaching material or requirements for competences [5]. However, in his opinion, these models lack in particularity and are difficult to apply. He suggests that institutions of education should use the models directed towards the process. However, they have to be used only as guidelines as the model should be applied according to the conditions of a particular institution.

According to [6], it is possible to research several different quality levels, define different meanings of quality and assess quality according to different attitudes. However, the most important is students' attitude as the quality depends on their expectations. Other authors also relate quality to justification of the user's expectations. It can be easily understood taking into consideration that the philosophy of quality came to the education area from the production area.

Article [7] maintains quite the opposite: it is wrong to identify quality with the user's satisfaction as it the system of education may not be created basing on the student survey which is often performed only once without sufficient information on the institution of education, its goals and conditions of activities. Consequently, there are a great number of factors that influence the students' opinion about the quality of studies which are not related to quality.

The [6] summarized that there is no single remedy or uniformly applied method for developing or assurance of quality. The level of quality depends on different goals and different meanings.

### Analysis of ways of learning influenced by IT

Therefore, quality is an objective or a certain process seeking to improve it. We can suppose that quality can be achieved through certain raised goals, conditions and requirements. However, in social processes it is difficult to determine whether the requirements were fully satisfied, whereas the quality of education expressed by academic achievements does not reveal the real situation.

As the quality achievement processes are dynamic and sensitive to changing conditions and requirements but at the same time systemic and periodic, not only particular requirements for the quality of learning must be analyzed but also the factors that make influence on them. It corresponds to [5] opinion that quality models directed towards the process are best suited for educational institutions.

The difficulty of determining the quality is illustrated by the standards and criteria of distance learning which are

rather wide and abstract. It means that there is no undivided set of requirements or unanimous attitude on the quality of distance learning.

This article is looking at the quality of distance learning as process. Distance learning will be described by the elements: learning conditions, methods, content, tools and communication. Consequently:

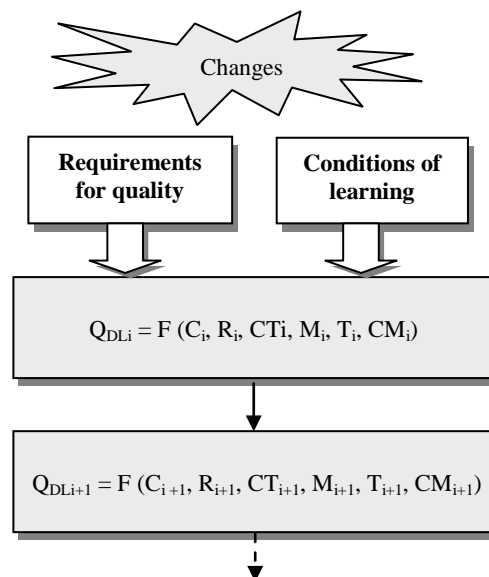
- *quality of distance learning* is an objective, correspondence to the raised requirements in implementation the learning goals in particular conditions;
- *assurance of distance learning quality* is a process determined by learning factors (conditions, content, methods, tools and communication) which is seeking for quality.

These definitions lead us to a conclusion that after the change of the conditions or quality requirements it is necessary to change other factors of the learning process thus assuring no lower level of quality. The assurance of the distance learning quality can be expressed by this dependence:

$$Q_{DL} = F(C_i, R_i, CT_i, M_i, T_i, CM_i), \quad (1)$$

where  $Q_{DL}$  – quality of distance learning;  $C_i$  – conditions of distance learning;  $R_i$  – requirements for distance learning quality;  $CT_i$  – content of distance learning;  $M_i$  – methods of distance learning;  $T_i$  – tools of distance learning;  $CM_i$  – communication of distance learning.

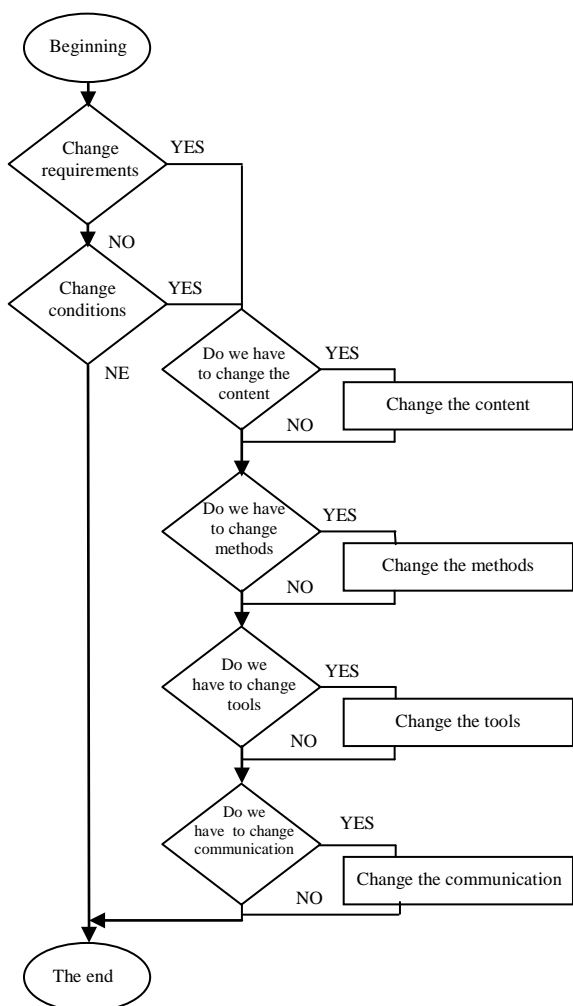
This dependence of the distance learning process under influence of changes is shown in Figure 1. External changes influence requirements and conditions. The teacher, reacting to changes and striving to keep the established level of learning quality, has to change the content, methods, tools and communication of learning – one or several of these elements.



**Fig. 1.** Assurance of quality of learning under influence of changes

The quality assurance algorithm under changes of requirements and conditions is shown in Figure 2. In case of change of the requirements and/or conditions, it is necessary to analyze which changes (content, methods,

tools or communication) will enable to achieve no lower quality of learning.



**Fig. 2.** Algorithm of process of distance learning quality assurance

Distance learning is often identified with more intense application of IT. However, we can see that the quality of distance learning is affected by many factors which on its turn are affected by IT.

Consequently, we can seek for quality of learning with help of IT, while implementation of IT in the process of learning is one of the ways to look over the so far used methods: apply them or change in order to improve the quality of learning.

Quality is often associated with efficiency, but these are two different things. *Efficiency* – is an ability to use the least resources in achieving goals, i.e.:

$$E = R/Ex, \quad (2)$$

where *R* – results; *Ex* – expenditures.

This proportion shows that efficiency (*E*) makes us reach for maximum result (*R*) with minimal expenditures (*Ex*). It cannot be equaled to quality as in the process of learning an opportunity to increase the efficiency by reducing expenditures and having a little drop in the result, may worsen the quality. Before concentrating on efficiency, we have to make sure whether we will not lose

quality. In order to achieve this, we need to form a different attitude towards efficiency, grounded on the principle of process assessment and improvement: *efficiency* – is an implementation of the set goals based on the quality to be achieved with minimal costs.

Often different ways of learning are compared according to their efficiency. However, learning is a multi-aspect process which depends on the conditions. It can be oriented to students of different age groups, or it can be organized in different social groups, or it may have different goals, etc.

Therefore, both quality and efficiency should be compared only in case the ways of teaching have the same goals and are taking place under similar conditions. Besides, we must have clearly defined criteria of comparison. Due to these reasons, traditional and distance learning cannot be compared as the conditions their performance differs too much.

It is often discussed whether distance studies are able to catch up with the IT development and use all IT opportunities. Experience shows that it is not. The IT opportunities are used in distance (or traditional) learning with delay. However there is another important question: if we use IT in distance learning, can all the variety of learning activities be implemented in high quality? And how efficient is it?

In traditional learning, we seek for goals under certain conditions, while in distance learning we have different conditions, communication between a student and a teacher is more complicated. In order to compensate for it and try to perform the activities of learning with no lower quality and efficiency, IT is used at a larger scale. However, ungrounded use of the variety of IT tools can produce an opposite effect – a lower quality of learning due to the techno-stress.

It is more complicated to assure the efficiency and quality of distance learning rather than traditional learning due to the distance between a teacher and a student. Therefore, distance learning must be a *consequence* defined by the *conditions* when a student cannot take a direct part in the process of learning, but not a self-purposeful pursuance.

A question arises whether distance learning can be performed in the same high quality way as the traditional one. As mentioned above, the increase of quality and efficiency is achieved, if IT are used to achieve quality and efficiency, and not as a self-purpose. However, in order to answer more exactly, it is necessary to analyze whether IT tools in distance learning let achieve as qualitative and efficient (or even better) implementation of all types of learning and teaching activities [8].

## Conclusions

IT used in distance learning make influence on the process of learning and change it providing new opportunities and forms which help to seek for planned quality and efficiency of learning. However the conception of quality of learning is not settled and in the literature it is defined in different ways.

This paper defines the quality of distance learning as an objective and correspondence to the raised requirements

in implementing goals of learning under certain conditions. Assurance of the quality of distance learning is defined as a process conditioned by factors of learning (conditions, content, methods, tools and communication) which helps achieve quality.

In life, changes influence conditions of learning and requirements for its quality. If they change, in order to keep the level of the quality of learning, it is necessary to change some other factors: the content, tools, methods and communication so as to compensate for the occurred changes. These factors are often changed with use of IT.

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### **A. Targamadžė, R. Petrauskienė, D. Rubliauskas. Influence of Technologies on Quality of Distance Learning // Electronics and Electrical Engineering. – Kaunas: Technologija, 2010. – No. 6(102). – P. 131–134.**

The paper presents a review on modern conceptions of the quality of education and reveals their variety. However, a certain indeterminacy of the definitions of quality can be noticed in their application in the process of learning as the process is under constant changing, it can be affected by different factors. The quality of distance learning is defined as an objective which should be improved during its supply. The paper also touches upon the dependency of the quality of distance learning on the influencing factors, and proposes an algorithm of the process of assurance of the distance learning quality under changes. The purpose of this algorithm is to correct the factors of the process of learning in case requirements or conditions change during the process: we have to analyse which changes (of the content, method, tools and communication) will permit us to obtain the quality of learning that is no lower than the present. Ill. 2, bibl. 8 (in English; abstracts in English, Russian and Lithuanian).

### **A. Таргамадзе, Р. Пятраускене, Д. Рубляускас. Влияние технологий на качество дистанционного обучения // Электроника и электротехника. – Каунас: Технология, 2010. – № 6(102). – С. 131–134.**

Представлено разнообразие современных понятий качества образования. Заметно отсутствие определённости в определениях качества при их применении к процессу обучения, так как этот процесс является изменчивым под влиянием многих факторов. Качество дистанционного обучения представлено как постоянно требующая усовершенствования цель. Представлена зависимость качества дистанционного обучения от влияющих на него факторов. Предложен алгоритм обеспечения качества изменяющегося под влиянием разных факторов процесса дистанционного обучения. Этот алгоритм предназначен для корректировки факторов процесса обучения при изменениях требований или условий: должно быть оценено, которые из изменений (содержания, методов, средств, коммуникации) позволят достичь качества обучения не ниже нынешнего. Ил. 2, библи. 8 (на английском языке; рефераты на английском, русском и литовском яз.).

### **A. Targamadžė, R. Petrauskienė, D. Rubliauskas. Technologijų įtaka nuotolinio mokymosi kokybei // Elektronika ir elektrotechnika. – Kaunas: Technologija, 2010. – Nr. 6(102). – P. 131–134.**

Straipsnyje apžvelgtos šiuolaikinės švietimo kokybės sampratos, parodyta jų įvairovė. Pastebimas kokybės apibrėžimų neapibrėžtumas, juos taikant mokymosi procesui, nes procesas yra kintamas ir gali būti veikiamas daugelio veiksnių. Nuotolinio mokymosi kokybė apibrėžta kaip siekinys, kuris turi būti gerinamas jo teikimo metu. Pateikta nuotolinio mokymosi kokybės priklausomybė nuo ją veikiančių veiksnių. Pasiūlytas nuotolinio mokymosi kokybės užtikrinimo proceso, veikiant pokyčiams, algoritmas. Šis algoritmas yra skirtas mokymosi proceso veiksniams koreguoti, jei proceso metu pasikeičia reikalavimai ar sąlygos: turi būti įvertinama, kurie pakeitimai (turinio, metodų, priemonių, komunikacijos) leis pasiekti mokymosi kokybę ne prastesnę už esamą. Il. 2, bibl. 8 (anglų kalba; santraukos anglų, rusų ir lietuvių k.).

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