

# ICT AS A TOOL TO DESIGN QUALITY MANAGEMENT SYSTEMS IN EDUCATION

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## ABSTRACT

Information and communication technologies bring and will bring new dimensions into education. Learning document processing and learning management are the main areas of the implementation of information and communication technologies in to education today. One of the very important development areas at the present and in the future are in the development and implementation of systems for the quality management of education. Here are many activities connected with formal specification of the quality of education. ISO 8402 specifies quality as “the totality of features and characteristics of a product or service that bears on its ability to satisfy stated or implied needs”. Quality management system design requires to determinate procedures and responsibilities for the realisation of processes. Process performance measurement and management are therefore essential for achieving and maintaining the required quality. Some education institutions do not put their attention on such areas of quality management enough. Present situation can be changed by information technology support by designing and building up the processes for quality management system. University of Zilina creates such system and this contribution will discuss about it.

## KEYWORDS

e-learning, quality of education, ISO norm

## ISO SPECIFICATION FOR SERVICES

Education can be considered as a service. As far as its quality is concerned, ISO norms 9000 may be applied to it. They specify the requirements for the Quality Management System. The System supervises the creation of products and services. This standard does not, however, guarantee their quality, it only verifies, controls and checks over the processes of their creation.

There have been several stages of creating and correcting of the ISO 9000 standard.

- The first version of ISO 9000 from 1987 was aimed at quality control by means of retroactive checking and modifying of individual activities.
- The 1994 version of ISO 9000 emphasised quality assurance via preventative actions, and it required filing and respecting of documented working methods. Companies were implementing the requirements of the norm by creating procedure manuals, which satisfied the ISO bureaucracy. The 1994 norm concentrated upon the process of audit. To meet the requirements of the audit, the norm was supposed to fulfil:
  - ✓ Business processes description,
  - ✓ Reference the procedure,
  - ✓ Evidence of the documented records.
- The 2000 version introduced the concept of process effectiveness by creating metrics, and it reduced the emphasis on having documented procedures. This version clearly specifies the expectations of the processes to be improved. It also specifies the importance of getting sufficient

feedback from customers, in order to know whether and how far their needs and demands have been satisfied.

ISO 9000 has been often discussed for being inconvenient to use in some organizations, and for impact it might have on a company culture. According to one group of specialists in our university it is not appropriate to apply the process of quality management by ISO 9000 in organizations where high potential of creativity of employees is required. They argue that processes technologies and customers' demands are never-ending and therefore can be blocked by ISO 9000. On the contrary, for example Demming focuses in his works on awareness of processes even when creativity is demanded. Many companies are ISO recognised only because the market forces require it and it is necessary for their businesses. This step the universities have not been forced to take yet. Of course, it does not mean that with the quality of education is not needed to deal. The question is what system or recommendation should be used.

ISO 9000 is composed of many sections. The ISO 9004 part, which covers the area of improvement itself, is the most important one for creating of quality system in education. This part has been taken as the basis for creation of our system of quality.

## **PROCESSES IMPROVEMENT**

In accordance with the ISO 9004 norm we consider the improvement of processes the most appropriate tool to create a quality management system.

Process improving is an activity aimed at increasing of process efficiency, namely in business processes, considering their goals. A systematic approach that helps make important changes in any business is called Business Process Improvement, BPI. It may be used in all organizations, profit and non-profit ones, governmental and others. By <http://en.wikipedia.org>, BPI works by means of:

- Defining what the organization's strategic goals and purposes are. Who are we, what do we do and why do we do it.
- Determining what the organization's customers or shareholders are, whom do we serve?
- Setting up of business processes to satisfy customers' requirements and how do we do their things better?

The goal of BPI is a radical change in an organization's behaviour. This radical model has published by Hammer and Champes, (1993) and the methodology Business Process Reengineering was recommended.

However, in the 1990s many enterprises used the expression "re-engineering" as a "softened" for layoff. Later it turned out radical changes could be achieved only gradually, which BPI had been found as an appropriate tool for.

### **BPI Principles**

The basic BPI principles of process improving may be summed up as follows:

- Basic activities concerning the results, not routine activities.
- Focus on the customer.
- Process comes first, only then automation comes.
- Regular benchmarking.
- Definition of whom the owner of business processes is.
- Creating of control points into a process.
- Standardizing of simple processes.
- Making of changes.

## **BPI Implementation**

The strongest resistance to BPI comes from an organization itself. Very often even managers do not wish to change the existing structures. In most cases it is because of the possibility of losing their positions within the current structure. Employees' negative attitude stems from their fear of losing jobs, or having to face changes in ever-so-simple routine they have learnt to handle and they have had no difficulties with. That is why the following principles are recommended in connection with the implementation process:

- Management has to be the leader of changes.
- It is necessary to find a good starting point for the changes, so that they are likely to be coped with successfully.
- State clearly the sequence and deadlines for the individual the steps to be taken to achieve the improvement.

Support financially all of those who are taking part in the process of changing.

## **Use of information and communication technology – ICT**

The improvement of processes is the most expressive by the information-communication technologies. ICTs are an important tool to enable us to make changes. On the other hand, applying of ICT to the existing processes themselves is not going to bring any remarkable improvement. It might happen that an incorrect application of ICT will slow down the improving process and thus reinforce the old ways of thinking. Implementing of ICT takes inductive thinking. This means first it is necessary to identify what options ICT can provide, and only then look for the problems ICT might resolve. This way, very often problems that no one has ever known about are discovered.

## **DESIGN OF QUALITY MANAGEMENT SYSTEM IN A UNIVERSITY ENVIRONMENT**

The university environment is considered as very specific. Regarding the nature of the main processes, we believe that applying of the BPI methodology is the right tool for quality management system design as well as for changes of education processes by means of ICT implementation. The approach used in our project is described in the following parts.

### **Strategic Goals and Aims Specification**

The main mission of universities is to provide education. University education is a service the recipients of which have not been specified explicitly. We have to look on them in the following way: Direct customers of the educational service are students. They are in direct contact with the provider of the service. But students cannot be considered as the only customers. After they graduate, they start finding their places in the real working world that often evaluates students according to their knowledge and skills acquired at university. Therefore employers are also taken as customers, but indirect ones. So, when defining strategic objectives and intentions, one has to respect the demands and needs of both of the above mentioned categories of customer.

Their demands and needs have to be the basis for formulating of the strategy. For students, it is the form of education that matters the most, because it is what they are directly concerned with in the course of their studies. For employers, the educational content students are given to study are the most important, as the knowledge and skills acquired during their studies are those that former students apply at work.

### **Specification of Customers' Demands**

#### *Educational Contents*

Creating of educational contents at Slovak universities has been to a great extent influenced by the transformation into a 3-level system and subsequent accreditation. However, this is not the main reason of changes. They have to result from the needs of practical everyday life, as well as from our new

reflections on the mission of the university and education as such. When creating new study branches and programs the main attention must be paid to student – their ability to make their presence felt in everyday working reality. The study branches and programs have to be compatible with standards of European educational institutions, and also the requirements of professional associations.

Study plans have enable students:

- using of unified study standards in all taught subjects,
- mobility,
- measure the quality of their education by means of comparing it to other institutions.

#### *Educational / Teaching Methods*

It is necessary to change educational methods according to the knowledge, skills, abilities, behaviour, attitudes and values that have been specified by pedagogical documentation and that will be expected from students after they graduate. First of all, there are:

- Self to gain the information and knowledge and to integrate them,
- Active, independent and creative approach to problem solving; in both individual and team-work manner,
- Ability to communicate,
- As close as possible the contact between students and the real world of work (affiliations, field trips, diploma and bachelor works according to praxis needs...)
- etc.

The part of aforesaid requirements is respected today. Additional requirements can be incorporated to the design of the new quality management system.

#### **Determining of Business Processes**

So far, universities have been only rarely applying the process approach to management, which is a state impossible to retain on. In their intentions, universities most commonly declare two main processes: the process of education and the process of science and research. But this is the point the process approach at universities usually ends at. In (Dado, Drozdová, 2003) we have indicated the solution to the process approach at the university for the entire educational process. The universities and departments that have got the ISO Certificate have created process maps of all processes. It is up to the managements of universities how they will begin to change the processes on the basis of customers' demands, and what system of quality evaluation they will create.

#### **Selecting a Process to Be Improved**

The resolution, which university process should be improved, as the first one, was conditional in the design of the e-learning system. Therefore it was the educational process that was chosen. It is a process, which brings the most profit to the mass of universities in Slovakia. In the process of education, the process of teaching is the most important. Teaching students at universities is done in the following forms:

- Lectures
- Exercises
- Seminars
- Self-study.

Teaching process is directly connected to the process of examining.

#### **The Analysis of the Current Educational Process**

The analyses of the process of teaching and the consequent process of examining have uncovered the following problems:

In the teaching process:

- Lectures often only repeat what has already been published in a written form; or, sometimes students' notes from the lectures provide them with the only study material.

- The educational process organized in the form of lectures, seminars and trainings represents a regulated type of education, giving students only little space for their independent work.
- Students' attendance to lectures is poor.

In the examining process:

- Students are tested only after a study term is finished. Knowledge gaps, if any, are discovered too late for students to catch up with what they have discovered to be weak at.
- The teacher who examine is often barrier, which the student needs anyhow to overcome. Quite frequently one can hear students announce whom they have just "got over" rather than what exam they have just passed.
- To a very limited extent software tools have been used to evaluate students' results. Often, the evaluation is merely up to the subjective judgement of the teacher.

### **Teaching and Learning Process Improvement**

Use of electronic support system in the learning and teaching, the following improvement can be reached:

- All part of teaching process, which only presented informations, can be processed electronically in many cases to be interactive and multimedia-based. Many lectures, which content more encyclopaedic information and do not need interpretation, can be studied from electronic and written materials. More exercises and cases are required to understand the studied information and to obtain knowledge and skills.
- The examination is also a form of presentation of the information, only in the opposite order. This presentation can be solved by electronic support via tests. This form of examination can be a part of process teaching and learning and can be used during all teaching and learning time, not only on the expiry of this time.
- New process of creation of the study materials has to proceed for so changed learning and teaching process.

### **Control Points of Quality Verification**

An electronic support system makes it possible to define control points, which give information about the specified evaluation marks of learning and teaching process.

#### *Study material*

Publication of study materials and links to them in the e-learning system enables the guarantee of the study program and branch or the management of university to evaluate the quality of study materials. The management of individual faculties specifies the competences. We assume that the common European education area much better study possibilities at universities. Universities will obtain students not only by means of different content of education, but by means of the approach to educational and mainly learning and teaching process, too. New approaches to the study material creating together with education form will be so important as the technical devices and laboratory equipment.

#### *Knowledge evaluation*

Creating the system of electronic support of education may change the educational process; and in the new process two forms of teaching apply:

- Classical face-to-face form
- On-line form, by means of the electronic e-learning system

The particular form of each part depends on a given study branch or subject. A student has to fulfil given tasks in a required quality, which are then checked on and evaluated according to given rules. Checking and evaluation are the main motivation factors, whatever the activity is. The system of electronic support of education provides also an opportunity of knowledge check back. The objectivity of testing will be guaranteed by standardized tests, and unambiguous computer evaluation system. The

only thing a teacher will be supposed to supervise is a student's authenticity. Testing thus will not be restricted only to a "testing period". Students will be able to test their knowledge of the course of a study term, and will therefore have enough time to improve themselves, if it is deemed as necessary. A good and reliable testing system is also a source of motivation for students. It might change the student – teacher relation in a remarkable way. So far, teachers have needed students to have somebody to teach, not to obtain the mark.

#### *Evaluating of Students' Satisfaction with Teaching*

Another evaluation point of educational process will be an evaluation sheet of the subject students will fill in after they have attended the lectures. The sheet will provide the feedback for teachers, enabling them to improve the quality of education, as well as for the university management, providing them with an opportunity to check on the tuition. The electronic processing of the evaluating sheets is very simple. A problem might appear if, in spite of students' demands, a teacher would not be willing to make a required change. For this situation, it is necessary to create appropriate evaluating and motivating mechanisms.

### **CONCLUSION**

One of possible solutions, which can support the quality in education, is described in this paper. This approach arose from systemic solution and implementation of the e-learning system at the University of Žilina. It is for us the basis for creating of quality management system. We assume that this particular solution supported by information and communication technologies will be an important element of quality management system design.

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