

E-LEARNING IN THE FACULTY OF MANAGEMENT OF CZESTOCHOWA UNIVERSITY OF TECHNOLOGY: RESULTS AND CHALLENGES

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Abstract

The subject matter of the article are the issues connected with functioning and development of remote teaching at the Management Faculty of Czestochowa University of Technology in the years 2011-2016. The Author presents in it experiences in the scope of traditional teaching methods support and characterizes factors that influence the quality of the system. Moreover, attention has been drawn in it to the growing importance of e-learning in the context of open educational resources development. The conclusion includes an outline of challenges and development possibilities of distance learning.

Key words: *e-learning, blended learning, online learning, e-learning experiences*

1. INTRODUCTION

The progress that has been observed in information and communication technologies has led to major changes in the principles of competition in the era of big data and cloud computing. Continuous development of modern tools and IT solutions is radically transforming the landscape of higher education (Daniel, 1999). The survey carried out by the Instytut Badania Opinii Homo Homini (Institute for Opinion Poll Homo Homini) at the request of Polish Open University revealed that over a half of Polish students considered distance learning as likely to replace conventional university courses (Raport e-learningTrends, 2012). Furthermore, the survey clearly demonstrated a substantial delay in implementation of e-learning tools at small universities and educational centres. There are numerous causes of this problem. Undoubtedly, one of the main barriers to implement e-learning is budgetary and organizational limitations that inhibit such investments (Dudek & Kobis, 2015). However, at many universities, including those smaller ones, availability of e-learning courses could become a catalyst for their development while substantially extending the scope of educational services. Also, European higher education is facing serious challenges. In the presented strategic documents, the European Commission emphasized improvement in the quality and better adjustment of learning and teaching to broader social needs and demands of the labour market (COM(2011) 567 final). The noticeable increase in the number of students and institutions of higher education all over the world and the necessity to adjust to the widespread globalization of society stimulates the need for facilitation and even broader access to higher education through application of modern technologies. It is expected that the demand for higher education over the nearest two decades will soar from 99 million to 414 million in 2030 (COM(2013) 499 final). With increasing needs for acquisition of knowledge and improved social mobility, particularly on the emerging markets, higher education will become within the reach of hundreds of millions of citizens worldwide.

The advantage of living in our times is an access to wide sources of information which is provided by the Internet. In an era of developing Internet communication, such institutions as universities are forced to use modern technologies, to efficiently implement strategic aims. Furthermore, both technology and expectations of students are changing, which is conducive to flexibility of activities and focus on extending knowledge through continuous improvement and orientation towards knowledge management (Kulej-Dudek E, 2013). While technology alone might not be the answer to all of the problems that universities face, according to Daniel (1996), it certainly can play a key role.

The university students expect more options to choose university majors, forms of learning and time adjusted to their individual, personal preferences and interests. For this purpose, they are willing to start learning both in their home country and abroad, also using the courses offered online or mixed forms of learning being a combination of all these options. In order to make this process effective it must be implemented on the basis of well-chosen IT tools, including Internet technologies, like

distance learning platforms. Online university courses represent an especially promising solution as the universities have opportunities to create their own programs of distance learning.

2. FUNCTIONING OF SYSTEMS OF DISTANCE LEARNING IN THE FACULTY OF MANAGEMENT IN CZESTOCHOWA UNIVERSITY OF TECHNOLOGY

Various types of multimedia systems have been used by the majority of Polish universities to support didactic processes. These systems include distance learning systems which typically supplement conventional tools and techniques used in teaching theoretical problems and development of practical skills. They contribute to an increased efficiency of trainings and reduction in their costs (Faber 1998) and provide unlimited access and resources to learn (Tierney 2014).

The first attempt to implement e-learning at the Czestochowa University of Technology was made in the Institute for Metal Working, Quality Engineering and Bioengineering in 2001. More extensive activities focused on e-learning systems were started in the Institute for Theoretical and Applied Information Technology in September 2002. Another stage in the development of e-learning at the Czestochowa University of Technology were activities aimed at acquiring resources from structural funds designed for development of distance learning systems. Consequently, a platform for distance learning was established as an outcome of implementation of Module III: e-Learning of the project Plan for Development of the Czestochowa University of Technology financed from the resources of the European Social Fund within the Priority IV of the Operational Programme: Human Capital. The overriding aim was to create the work environment facilitating studying and also teaching university students how to use multimedia technologies.

Currently, there is a general university platform at the Czestochowa University of Technology (<http://e-learning.pcz.pl>) which involves all the faculties and is based on the Moodle platform. The Moodle platform was chosen for several reasons, including an open character of the software (GNU license), popularity of the platform dedicated to education (with over 10 million online courses all over the world) and the incessant development by a broad group of Moodle users and its community (see Figure 1). Due to the character of this study, the detailed description of mechanisms and procedures for implementation and conducting online courses will be presented with the example of the courses implemented by the employees of the Faculty of Management of the Czestochowa University of Technology.

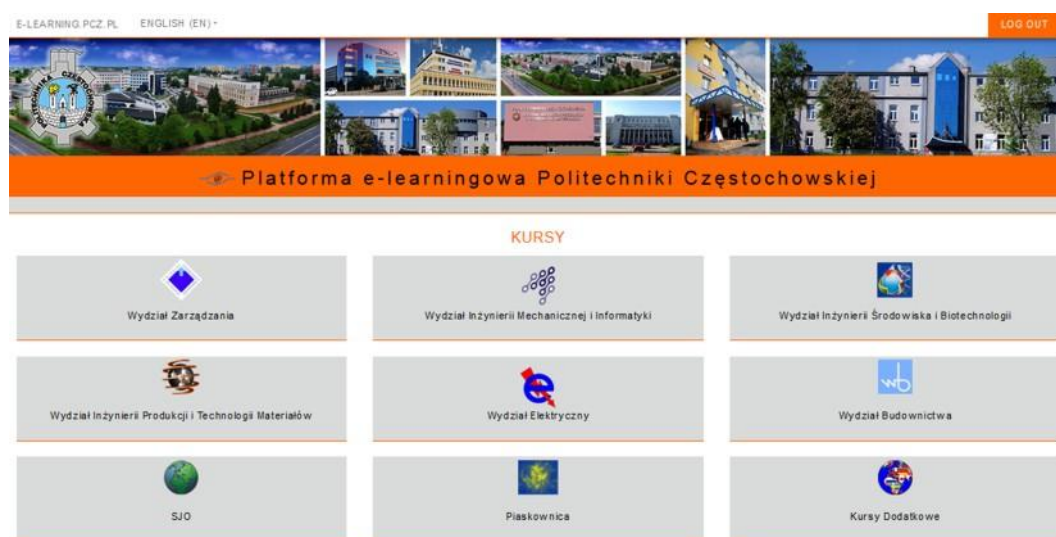


Figure 1. The structure of general university e-learning platform at Czestochowa University of Technology

The e-learning system used in the Faculty of Management of Czestochowa University of Technology has been developed since 2010. Initially, it was used for employee training. Currently, it provides access to didactic materials for university students, testing and check tasks and projects. The system is available to didactic and research employees who positively completed the training in the area of development of author's e-learning courses and obtained certificates of completing such trainings. The certificate of completing the training is required by the authorities of the Faculty for implementation and teaching courses in the form of blended learning to support full-time courses over the whole curricula. Blended learning is carried out in teaching and learning environments where there is an effective integration of different modes of delivery, models of teaching and styles of learning as a result of adopting a strategic and systematic approach to the use of technology combined with the best features of face to face interaction (Krause, 2007). This type of education can be defined in general as a combination of conventional and distance learning. The key difference between the two types of learning lies in the method of communication between the lecturer and students. In the conventional system, the lecturer and student communicate with each other directly and stay in the same room, whereas in case of distance teaching, they use multimedia and electronic resources. Blended learning courses should also increase the interaction between the instructor and students, and also among students themselves. It should furthermore enhance the mechanism for integrating formative and summative feedback in order to boost students' learning experiences (Yen, Lee, 2011).

Blended learning is a complementary education that has been used at the university. The use of these forms in the didactic process may vary. In general, e-learning is extended gradually with growing experience and as the didactic resources are prepared. E-learning methodologies may be used in the form of lectures, exercises, projects and other courses. Education focused on development of practical skills, including laboratory classes and workshops occurs in real conditions during didactic classes that require direct participation of academic teachers and students. The direct participation of teachers and students is also needed for exams for subjects taught using e-learning platforms.

3. DEVELOPMENT AND IMPLEMENTATION OF E-LEARNING COURSES

Many employees working for the Faculty of Management are involved in improvement of the electronically aided learning. The didactic materials published using the e-learning platform are available after logging in by means of an identification key and password. Depending on the level of authorization, the platform users have different tasks to perform in the system and access to different functions. Materials prepared by teachers and authors of the courses are varied in terms of complexity and variety of resources and multimedia solutions. Obviously, their quality depends on creative inventions and involvement of the authors in the process of course creation. In order to make the process of preparation of e-learning didactic resources more uniform, the guidelines for creation and teaching e-learning courses at the Czestochowa University of Technology were implemented. The procedure for preparation and teaching e-learning courses was presented with respect to the guidelines used in the Faculty of Management of Czestochowa University of Technology. The procedure is composed of the following stages:

- filling in the declaration of course preparation,
- modification of the guidebook for the subject lectured during the course,
- preparation of an e-learning course project,
- implementation and technical acceptance of the course,
- training for students concerning the use of the platform,
- implementation of the e-learning course,
- course evaluation,
- course archiving.

3.1. Declaration of course preparation

The declaration is an official proposal of the author submitted to the authorities of the Faculty, which represents the document that guarantees that the course will be used in the educational offer after a specific time. The declaration is submitted to the Dean's Representative for e-Learning Courses in the faculty. After obtaining the permission for preparing the course, an electronic version of the declaration is sent to the platform administrator in order to design the course structure on the platform.

3.2. Subject guide

A subject guide is a document used for each subject to define e.g. the objectives for the subject, initial requirements of knowledge, skills and other competencies and other learning outcomes. This document describes didactic tools used during the classes. The task of the course author is to supplement the document so that it offers the opportunities for classes in the e-learning form.

3.3. Project of the e-learning course

Course project is a document where the author characterizes the method of course teaching. The author makes the choice of the resources and components to be used while creating the course. Furthermore, he or she indicates the didactic contents to be taught using the e-learning platform and those to be used conventionally. The course project prepared by the course's author is evaluated in terms of the contents and technical functionality. The evaluation of the contents made by the direct superior takes into consideration the correctness of the choice of the problems for e-learning courses, correctness of the didactic objectives for the knowledge cards and activities included in the e-learning course, correct choice of the contents included in the topics of the e-learning course, correct choice of the principles for passing the contents in the e-learning course, correct time of implementation of individual activities included in the curriculum taught during the e-learning course and correct choice of auxiliary literature for the topics studied. Furthermore, the technical evaluation takes into account the correctness of the division of the topics in terms of their implementation using the conventional and e-learning methodologies, correct choice of the platform tools expected to be used for explanation of the contents included in the curricula of the e-learning course and correct choice of the platform tools to be used in terms of developing the activities to teach the contents of the e-learning course.

3.4. Implementation of the course using the platform and its technical acceptance

Another stage is implementation of the course to the platform. This stage concerns uploading didactic materials for the e-learning course, completed with writing an acceptance protocol for the implemented course. The acceptance protocol for the course represents an integral part of the e-learning course project. Next, after obtaining a positive content-related and technical assessment of the course, its author submits the project of the e-learning course to the Dean's Representative for e-Learning Courses in the Faculty of Management, which is synonymous with including the course to the educational offer of the Faculty of Management of the Czestochowa University of Technology.

3.5. Training for students

Before the participation in the course, the students have to be trained how to use the e-learning platform. The students are familiarized with the access rules, organization and functionality of the platform. Each student is obliged to confirm the fact of completing the training by signing the required declaration. The course teachers are obliged to store the declarations in their documentation with other documents prepared for the group/subject.

3.6. Course implementation

At this stage, the authors of the courses implement the course according to the previously prepared project of the e-learning course. It should be noted that each teacher can choose the didactic contents and decide which contents will be taught using the platform and which will be taught using the conventional methodologies. Creation of the contents and didactic resources should take into account two characteristics of didactic resources: its electronic form and a close relationship with the intended objectives and learning outcomes. Furthermore, depending on the type of contents and form of implementation of the didactic process, one should adjust the tools and components respectively to their own skills and abilities and to opportunities and weaknesses of the Moodle learning environments.

3.7. Course evaluation

The course is evaluated before it is started and after it is completed. Continuous monitoring of the course is possible. Before the course is started, the course project and resources downloaded to the e-learning platforms are evaluated. The evaluation is performed by the Representative for e-Learning courses in the faculty. After completion, the course is analysed and evaluated by the participants (students). The survey questionnaire used by students to evaluate the course is made available by the Representative for e-Learning course in the faculty or e-learning.pcz.pl platform administrator. The survey among the students is anonymous and based on using an electronic questionnaire form.

3.8. Course archiving

Archiving of all the courses is performed by Platform Administrator after completion of the resit exam session in a specific university year. The full copy of the course with logs, assignments and threads in the discussion board is stored in order to ensure course verification and meeting the learning outcomes.

4. EXPERIENCES IN TERMS OF SUPPORT FOR CONVENTIONAL FORMS OF LEARNING

Didactic materials published on the platform in the form of courses support development of student self-learning abilities and lifelong learning abilities using IT technologies. Students who participate in classes available within the e-learning platform can enroll online for individual subjects and have access to the didactic resources connected with these subjects and to use current electronic forms of learning offered within the platform. Copying of the didactic materials is limited due to the property rights. The courses are grouped according to the university majors offered in individual faculties (see Figure 2).

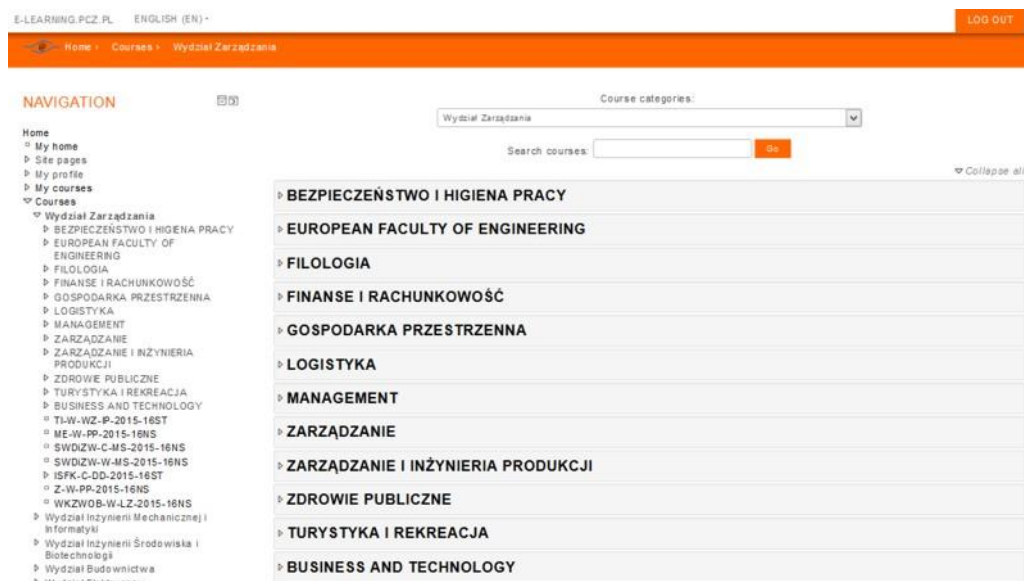


Figure 2. Structure of university majors in the Faculty of Management at Czestochowa University of Technology

The increasing popularity of distance learning observed all over the world and in Europe also translates into the number of the courses offered within the e-learning platform in the Faculty of Management in Czestochowa University of Technology. The number of courses is increasing year by year, followed by the greater number of teachers interested in extending the e-learning services.

Only 7 teachers in the academic year 2011/2012 participated in preparations and teaching e-learning courses. In the academic year 2015/2016, this number soared to 33 (see Figure 3).

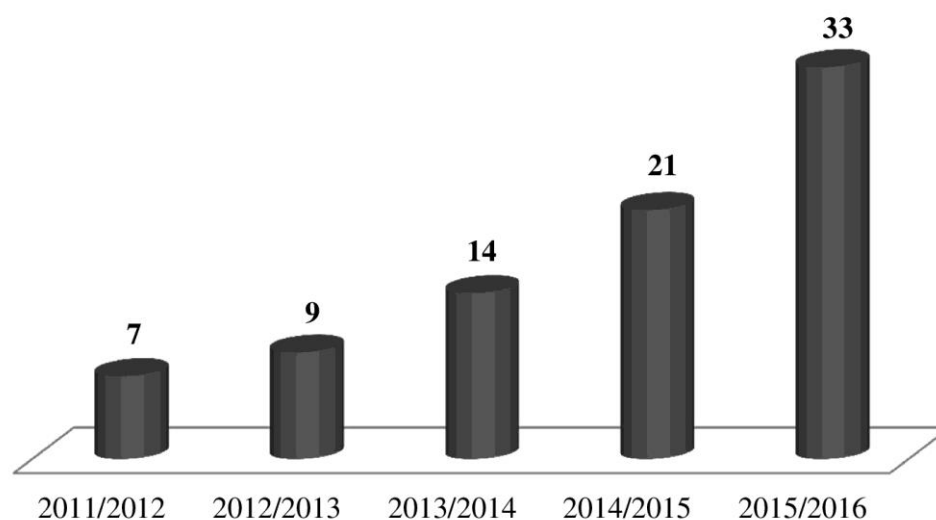


Figure 3. The number of teachers in e-learning courses in individual years

5,077 hours of e-learning classes were taught in 2011-2016, including 3,858 hours in full-time courses and 1,219 hours in extramural courses. Detailed comparison of the number of course hours in individual years is presented in Figure 4.

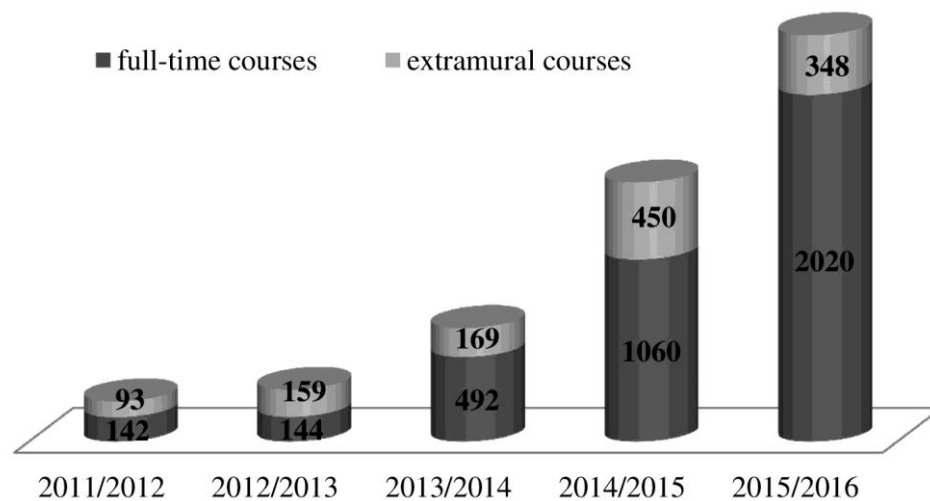


Figure 4. The number of e-learning class hours in individual years divided into full-time courses and extramural courses

The growing popularity of blended learning courses is also reflected by their participation in the total number of hours according to the plans of studies and learning programs in individual university majors in the Faculty of Management of Czestochowa University of Technology (see Table 1).

Study major	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016
Management	3.11%	2.06%	4.40%	8.45%	11.92%
Management and Production Engineering	0.24%	0.76%	3.48%	9.42%	8.48%
Information Technology and Econometrics	0.99%	0.60%	1.99%	-	-
Logistics	0.00%	2.16%	3.78%	2.61%	5.12%
Public Health	0.83%	1.38%	0.46%	2.08%	5.97%
Philology	0.00%	0.00%	0.00%	5.62%	12.19%
Land Management	-	0.00%	0.63%	0.45%	0.45%
Health and Safety	-	0.00%	1.44%	2.53%	2.32%
Finance and Accountancy	-	0.00%	1.67%	2.22%	20.78%
Management (in English)	-	-	0.24%	1.59%	0.41%
EFE	-	-	-	1.13%	2.74%
Tourism and Recreation	-	-	-	-	1.08%

Table 1. Percentage of e-learning classes compared to the number of hours according to study plans and curricula divided into university majors in individual years for full-time studies

Entries in the table with dashes denote the lack of the university major in the educational offer of the Faculty of Management of the Czestochowa University of Technology.

Figure 5 presents a total percentage of e-learning classes in full-time and extramural courses with respect to total number of e-learning class hours according to study plans and curricula in individual years. The increasing tendencies are being observed in the interest in this form of education among both teachers and students who participate in online courses.

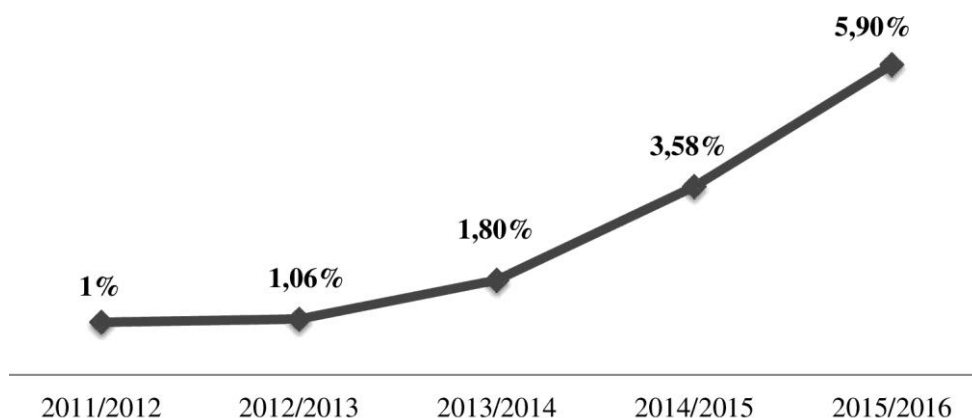


Figure 5. Percentage of e-learning classes in full-time and extramural courses with respect to total number of e-learning class hours according to study plans and curricula in individual years

The number of courses in the Faculty of Management at the Czestochowa University of Technology was also rising year by year. Initially, this number was 21 and, in the academic year 2015/2016, it soared to 118 (see Figure 6).

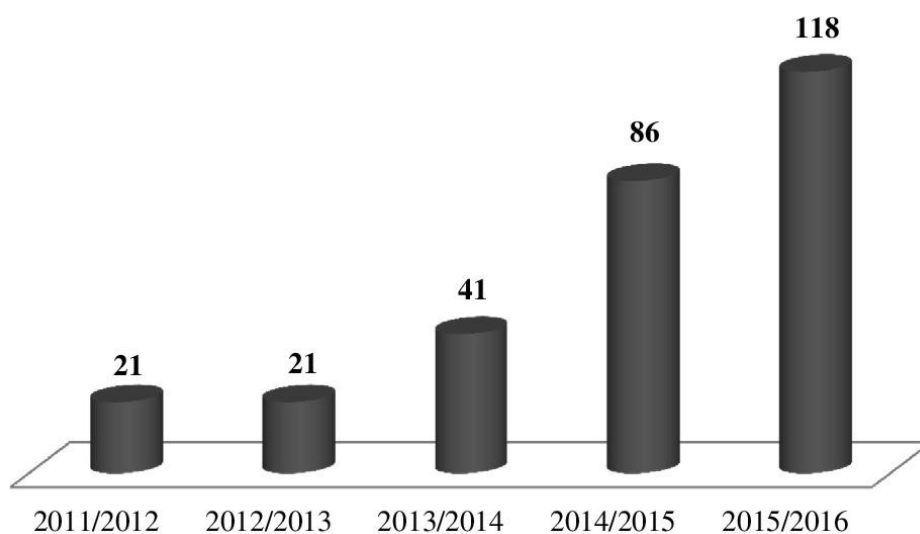


Figure 6. The number of e-learning courses available in the educational offer of the Faculty of Management of Czestochowa University of Technology in individual years

As it can be observed with the example of the Faculty of Management of Czestochowa University of Technology, e-learning is not only viewed as a fashionable type of education and intellectual development of university students but it is becoming the natural stage in evolution of the conventional learning. However, in order to use this methodology effectively, it is necessary to choose tools and information technologies which are adequate from the standpoint of effectiveness and efficiency of the learning process.

5. KEY SUCCESS FACTORS IN VIRTUAL LEARNING ENVIRONMENT

A skillful use of tools and information technologies represents the basic component of learning in the virtual teaching environment. On the one hand, technology substantially extends educational opportunities, but, on the other hand, constant development of technology makes it necessary to continuously develop skills and improve competencies necessary for using the technology for your own development and in other areas of activity. Properly selected tools may significantly affect the quality of education and represent the basic instrument in transfer of knowledge, motivating students and increasing their commitment to achieving the goals. Working with university students requires a number of skills, especially concerning modern technologies, access to extensive data and information from any place in the world. In the era of globalization, university students are better educated and more aware. Consequently, this requires a modern approach and the method to transfer knowledge.

The platform for distance learning offers incredible and unlimited opportunities for development of both students and teachers. A very important skill is the unconventional method to transfer knowledge that allows for engagement of the most modern internet technologies, information technology tools, modern solutions and, first and foremost, encourage students to develop their own ideas and creative thinking. Undoubtedly, in order to be effective, the learning process should be interactive. This forces teachers to use the means of communication, tools and technologies which are the most effective in motivating students and transform learning into interactions between the content recipient and sender. This means that students should not only obtain information but they also should take active part in its creation.

However, the ability to choose tools of communication and learning specific skills is insufficient. One should also learn how to use them effectively in practice. Organization of e-learning courses requires an ability to affect others from the distance, including motivation for behaviours desired from the standpoint of the adopted didactic goal. These activities have additional consequences since they force teachers to search for more advanced multimedia tools and abilities to use them efficiently and effectively. On the other hand, the websites offer the opportunities for interactions between teachers and students that have not been seen before, while engaging listeners and stimulating them for development of new areas of knowledge.

6. CHALLENGES AND OPPORTUNITIES FOR DEVELOPMENT OF E-LEARNING

The classes taught using the e-learning platform in the Faculty of Management of the Czestochowa University of Technology are becoming more and more popular due to the high effectiveness of curricula, especially in case of bigger groups of students. Blended learning ensures flexible organization of the whole educational process through trouble-free virtual interaction with students while effectively improving the level of education and comfort of work of both teachers and students. There is considerable evidence confirming the fact that blended learning can positively impact student achievement. Research has shown, for example, that blended learning can foster a decrease in student attrition and facilitate an increase in the passing rate of student examinations (López-Pérez, Pérez-López, Rodríguez-Ariza, 2011).

Due to the growing importance of computer-aided learning at the Czestochowa University of Technology, a system of online studies is likely to be created in the nearest future, representing not only a support tool but also an alternative to conventional forms of studying. An important element in correcting the functioning of „new“ universities is communication, which creates the proper interactions between different institutions and organizations. We have already long observed the activities of globalizing firms, which extorts changes in organizational structures and business processes. This situation induces economic subjects to use effective communication systems, enabling firms to exit from relatively closed space in direction of open IT systems. This system would enable an interactive interchange of various information among decision-makers, with groups of workers cooperating with firms and with customers. Trends in firms, will soon begin to be obligatory in the educational system. As a result, universities will become like a global centre. But that is possible only,

when the management processes will be carried out on the basis of modern informatics structures. Thanks to that, universities will open up to the world. Distance learning will become a standard. The additional use of multimedia tools will considerably make educational process more attractive and more effective.

Elimination of university majors, faculties, lectures and lecturing rooms and replacing them with distance realization of research problems and projects by groups of students through e-learning platforms may turn out to be an especially ground-breaking stage in the development of distance learning, which is becoming possible through ubiquitous information technology. Unlike the technology that has developed with modern scientific achievements, education has not changed much for the last decades. Furthermore, most of the problems that people attempt to solve and work on are too complex to be solved using only one domain of science. Therefore, the tasks that require practical solutions and have to be faced most frequently at the stage of professional work often need an interdisciplinary approach.

Drawing on models of peer learning, social constructionism, and communities of practice, authors such as Salmon (2000) offered guidance on maintaining learner engagement, communication and cooperation in safe and productive online environments in which they could work 'together developing original thought and carrying out the preferred learning outcome: the construction of their own knowledge and meaning' (Palloff, Pratt 2001). Students will acquire knowledge much easier while being involved in team projects with participants spread all over the world. This will create the new quality and allow for an unlimited access to information and knowledge. Similar to what is observed in enterprises, they will become the decision-makers in terms of selection of learning modes and methodologies. Using these solutions, participants of online courses will be able to carry out similar projects in global corporations in the future. Our experiences with e-learning courses confirm this thesis unequivocally.

Nowadays the idea of education covers other areas than in the past. Together with a very dynamic educational development, which progresses simultaneously with changes in the approach to this process, one should concentrate attention on the qualities of student services and assure access to information. Open integrated structures helping university service will considerably shorten the time of preparing and recording information, as a result of implementing statutory aims. In the near future only efficiently working universities will count and their internal processes will be carried out by IT tools, supported by the Internet technology.

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