INNOVATIONS IN COMPUTER SCIENCE TEACHING USING DISTANCE LEARNING

Dragan Soleša[1], Snežana Anetić[2]

Abstract

With the rise of information and communication technologies, and especially the Internet and its services, obstacles such as time and space are no longer an issue. Knowledge and information are at your disposal quickly and easily, stored on servers worldwide. There is a new problem, however. There is no lack of information, as before, but there is a surplus of information, and to solve this problem we need new knowledge and skills. The purpose of this paper is to set up an understandable and acceptable foundation for working on the demanding and responsible job of introducing e-learning into the teaching process. This paper also discusses the key aspects of e-learning, as well as the tools needed to develop and improve the educational software.

Key words: *e-learning, net-generation, Moodle, LMS, m-learning*

Introduction

Establishing information society and knowledge society brings about new challenges for the system of higher education. How to keep the continuity of traditional values that are provided through university education, while at the same time respecting and incorporating new forms of knowledge and skills, demanded by today's student and their future employers? The questions of the quality of education, the efficiency of the educational process, as well as relevancy and sustainability of knowledge that is the result of the process of education are today at the forefront when it comes to changes brought about by the Bologne process, throughout Europe and in Serbia, as well.

[1]Dragan Soleša, Ph.D, University Business Academy in Novi Sad, Faculty of Economy and Engineering management, Cvecarska Street no. 2, 21 000 Novi Sad, Serbia, Phone: +381 21 400 484, E – mail: dragan.solesa@fimek.edu.rs

[2]Snežana Anetić, Master Student, University Business Academy in Novi Sad, Faculty of Economy and Engineering management, Cvecarska Street no. 2, 21000 Novi Sad, Serbia, Phone: +381 21 400 484, E – mail: snezana.anetic@fimek.edu.rs

At the same time, the systems of higher education are facing the problems of limited financial and physical resources, and an accompanying rise in the number of students and educational groups. At the same time, it is expected to provide more attention to each student and secure the individual approach in team and project work environment, and all this without a real possibility to increase the number of teachers.

Apart from globally recognizing the importance of knowledge and education, one cannot disregard the fact that they have become global, just like the processes linked to them, competitiveness in the field of education and the market of knowledge and education, as one of the most important markets of today (Clark, 2012).

On the other hand, information and communication technologies (***ICT***), especially e-learning technologies, offer new possibilities and secure the advancement of the educational process and its results. These technologies can ensure new strides being made in quality, scope and variety of educational content, as well as the efficiency of progress measurement and educational quality supervision. The application of e-learning contributes to the standardization of the educational process, ensuring the equality of the scope and quality of knowledge gained by the students during their education (Soleša, 2006).

E-learning technologies can improve the efficiency of teaching and learning, as well as the efficiency of using the existing human and material resources, especially in cases where a large number of students are at a satellite campus.

New technologies have become a part of our everyday lives, and this is why the social pressure for them to efficiently integrate into educational process is on the rise. This pressure is justified also due to technologies (and especially e-learning technologies) being the most perspective medium for achieving lifelong and constant education of the citizens in an information society environment. This is another serious reason why we should expect and plan for the use of these technologies to become a standard in higher education, thus ensuring that the knowledge and capability to use e-learning technology become an integral part of every citizen's basic literacy (Clark, 2011).

There is no generally accepted definition of e-learning, however, the one used most often is the one defining e-learning in the broadest of senses as any kind of learning (education) supported by information and communication technology, with the goal of using ICT to advance the process of teaching and learning and improve the quality of the results of the education process.

Practice and experience collected over the years at many universities in the world point to the existence of various models and shapes of e-learning, differentiated according to pedagogic models they are based on, as well as teacher/student roles and responsibilities, physical location and temporal compatibility, and ICT application level. In practice, the hybrid models of e-learning have proven the most optimal (in accordance with real situation).

A good and proper strategic positioning and planning of e-learning as an integral part of the education process, as well as a quality and sustainable system of e-learning support have a crucial influence on the success and results of introducing e-learning in higher education. Bates (Bates, 2000) states the following in his *"Managing Technological Change: Strategies for College and University Leaders"*:

- The use of ICT and e-learning technologies has to be efficiently and directly connected and adjusted to the set educational (pedagogical) principles and goals in every concrete case;
- The decision on using e-learning has to be a strategic one, made by the university in the context of a general strategy of action and development of the university;
- Necessary resources need to be allocated for the application of e-learning, and the process of introduction and application has to be supported and continually supervised by those responsible;
- Use of technology must be simple and adapted to real needs of teachers and students alike, which is possible and necessary to achieve through a solid system of e-learning support;
- For a systematic application of e-learning at university level and achieving long term breakthroughs, a system of technical (ICT) and other (i.e. methodological, pedagogical) type of help and support must be established that will be stable, sustainable, reliable, efficient and accessible to both teachers and students;

Significant changes have been instigated at Serbian universities, based on the principles and goals of the Bologne declaration. Many important questions of principle need to be analyzed, such as the quality of education and training of students regarding the needs of the modern society and employers. This also includes practical questions that arise from the limited financial, material and especially human resources of the universities. Properly applied technologies of e-learning can enable and instigate processes in higher education, and make them significantly easier. Also, we have to emphasize that the inadequate use of e-learning technologies can bring increased resource spending without corresponding results.

The analysis of existing experiences and different approaches to e-learning introduction in the world, as models for the transfer of these experiences and creation of strategies and plans adapted to the specific conditions and needs of the Republic of Serbia can be directly useful for all the universities in Serbia that are rethinking their development and long-term activities.

To go from where we are now, with sparse positive examples at our universities, to the state of systematic and efficient use of e-learning at the level of the university and the entire higher education system, it is especially important to find and define adequate and appropriate goals, strategies and plans, while at the same time establishing a high quality, sustainable system of e-learning support.

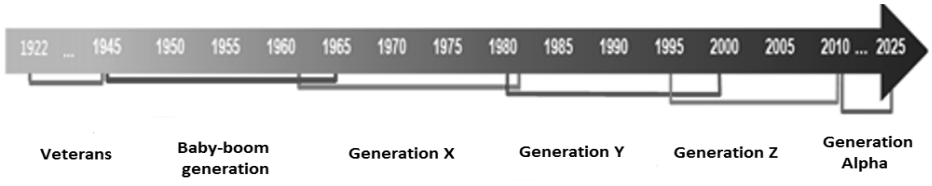
The Net Generation

Generation is a group of people defined by their age, i.e. these are people born during a specific time period, who grew up in a similar way and had similar experiences, so that their values and attitudes are similar. Numerous authors (Harrington, 2009, King, 2009) agree on that there are five basic generations of employees:

- Veterans (the Quiet generation)
- Baby-boom generation (Boomers)
- Generation X (the lost generation)
- Generation Y (the Internet generation)
- Generation Z (known as Generation 2020)

Newer papers from the field of managing different generations also state the newest generation, Generation Alpha (Grail Research, 2011). Considering that the members of Generation Alpha were born after 2010 and there are no scientific papers regarding their particular traits, therefore this generation will not be paid attention to in this paper. Fig. 1 shows the timeline of different generations.

Fig. 1 *Graphical representation of the years of birth of the members of specific generations*



Source: *Grail Research Analysis, 2011.*

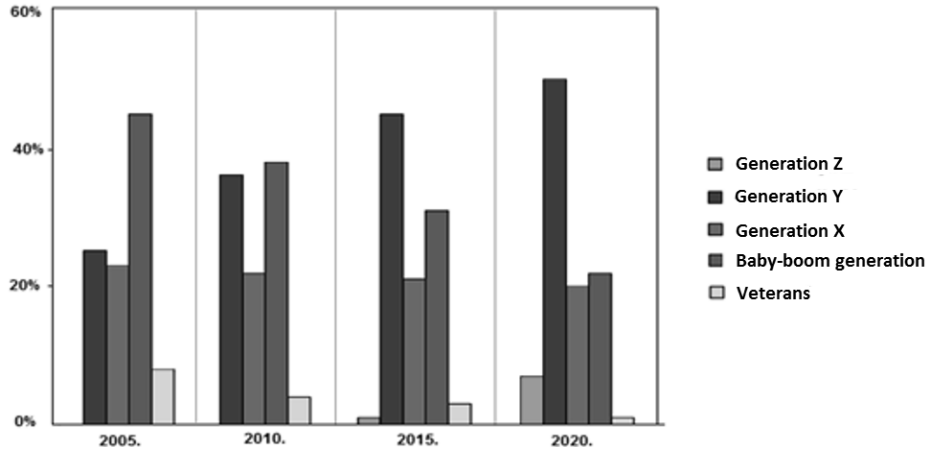
Authors of the paper on managing different generation cannot agree where a certain generation starts and finishes (Fig. 1). Zemke, Raines and Filipczak explain that there are no strict timeline borders for the end of one generation and the start of the other. Same authors still mention the following periods that mark particular generations (Zemke, Raines and Filipczak, 2001):

- Veterans – born in the period of 1922-1943
- *Baby-boom* generation – born between 1943 and 1960. Born in the period of exceptional optimism, great opportunities and progress.
- Generation X – born in the period between 1960 and 1980, at the time when the *Asian tigers* progressed: Hong Kong, South Korea, Singapore, Taiwan.
- Generation Y – born between 1980 and 2000. Grew up in a highly technological, optimistic times.
- Generation Z – born between 1995 and 2010. Grew up surrounded by information and communication technologies (Levickaitė, 2010).

Today's generation of pupils and students belongs to the generation born at the time of the Internet. Contemporary psychologists, sociologists and pedagogues mark it as Y or Z generation (Prensky, 2001). This generation started to use the computer between the age of 5 and 8, while at the age of 16 to 18, almost the entire generation started to use the Internet (Jones, 2002). In the USA, the exposure to technology starts early, kids who are 6 years of age or older spend on average 2 hours a day using electronic media (TV, computer, video-games), which is almost equal to the time spent playing outside of the home. The mentioned activities dwarf the time spent reading (39 minutes). It is worth mentioning that students usually use more than one kind of media at the same time. For children and teenagers it is normal to be on the Internet, communicate via social networks or their phone, watch videos and listen to the radio. Over 2 million American kids aged 6 to 17 have their own Web-pages (Montana&Petit, 2008).

Graph. 1. Shows the number of employed people according to the generations stated above in USA in 2005 and 2010, as well as future predictions for 2015 and 2020.

Graph 1 *Five generations in workplaces in the USA*



Source: *Bureau of Labour Statistics Employment Projections, 2007. According to Meister and Willyerd, 2010.*

Currently there are four generations present in workplaces, placed into four categories according to different experiences and values. Never in human history had it happened that four very different generations had to work together (Yu&Miller, 2005). The skills and potential do not correlate with age and experience, and this makes the respect towards unique ideas and perspectives of others is more important than ever (King, 2009).

Differences between generations can bring about the necessary heterogeneity at the work place, but can also cause potential conflicts and complications when employees of different generations have to work together (Stevens, 2010). This is exactly why good management of different generations is so important. Many organizations have started organizing various activities in order to overcome the generation gap (Hudson Jordan, 2010).

Along with the necessary heterogeneity, today's organizations have another goal, which is attracting and keeping the best work force. The way in which companies manage different expectations, career needs, communication styles and employee preferences definitely influences how well they will attract, develop, engage and retain top talent. It is important to understand each generation, as well as the challenges that generational differences bring. Understanding each generation is of utmost importance, because only this kind of employers can adapt to multigenerational workforce and

attract high quality workers as the war for the best workforce is reaching its peak (Meister&Willyerd, 2010).

E-learning

E-learning, or electronic learning, has been around for more than a decade, as learning which is amplified and made easier through the use of Information and communication technology. Technology of communication allows for the use of the Internet, e-mail, discussion groups and the system of collaborative learning. E-learning is used for long-distance studying, through Intranet network, and can be considered a part of flexible studying. When studying is done exclusively over the Internet, then it is online learning. When studying is done via mobile devices, such as mobile phones, laptops and similar portable devices, then it is called m-learning. Mobile learning (m-learning) and learning over a network (online learning) are two subsets of electronic learning (e-learning). All three of these sets belong to long-distance learning. As opposed to distance learning, learning in a classroom (face-to-face) provides the contact between the teacher and the student, and it is also known as contact learning. In practice, each of these types of learning is combined with learning in a classroom, providing a mixture called flexible or hybrid learning.

Electronic learning systems such as Moodle ((Modular object – oriented dynamic learning environment, http://www.moodle.com) offer learning solutions which are student-centered, built on socio-constructivist pedagogy. Students construct their knowledge through discussion, improving their thinking skills. Technological advancement made possible the creation of better, web-based, collaborative learning solutions. Asynchronous activities use the technologies such as blog, wiki, discussion groups and allow participants to cooperate when they are available. Synchronous activities happen to all the participants gathered in the same moment, such as chat-sessions, virtual classrooms or conferences (Rice, 2015).

E-learning is a term describing the educational process improved through the use of ICT. It is any form of learning, teaching or education that is helped primarily by web-based technologies. E-learning contains different aspects of ICT use in education: from simple use of computers in traditional classrooms (PPT presentations, computer simulations of processes, multimedia presentations, using Web content, and the like), through ‘transient’ or ‘hybrid’ teaching that uses both the direct classroom contact and online activities, to an online-only teaching where all the

activities of the teacher and the student are done without physical contact. It is important to emphasize that when we talk about defining e-learning, we talk more and more of a qualitatively new education that will provide an interactive or two-way process: teaching that will be student-centered (and not teacher-centered) and encourage active adoption and application of new knowledge, as well as joint cooperation between students and teachers.

E-learning provides numerous advantages for both the student and the teacher. Students are allowed flexibility in terms of time and space, as they can use the learning materials anywhere and at any time, which brings education to those who cannot normally visit the classroom. Learning becomes personalized, and all the relevant learning materials quickly available. Interactive learning content is used (simulations, online knowledge tests), as well as various media for content presentation (text with images and sound, video, animations, simulations, etc.). The interaction between the student and the teacher which is done via the computer is often more direct and intensive than classroom communication. Apart from communication, group work is also encouraged, which develops social and communication skills and brings the constructivist and collaborative principles of learning to the forefront. The teachers also take advantage of the flexibility regarding their time and location when teaching, with an easier way to communicate with the students and direct their work, as well as ensure a high-quality, more creative manner of achieving the set educational goals. Learning content can be updated easily and quickly, with the addition of newest findings and relevant information (Arshavskiy, 2013).

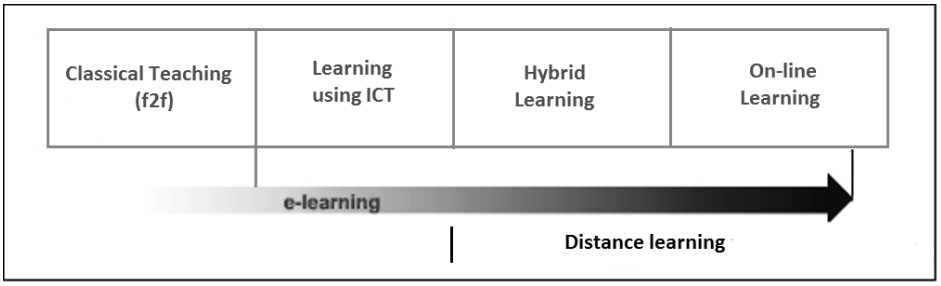
E-learning as a way of education existing at several levels: as a fully independent form, as well as an integral part or addition to classic education. Classification is mostly done based on the degree of differentiating it from the traditional learning strategies. Commonly, two approaches are mentioned:

- **Hybrid education** or a transient form of teaching (hybrid learning, mix-mode) – a combination of classic classroom teaching and teaching with the help of ICT.
- **E-education** (e-learning) – form of teaching where students learn independently and online.

Extended classification or ‘timeline’ of e-learning shows education as a continuum, with the left end reserved for classic or traditional teaching (f2f, face-to-face teaching). The step towards e-learning starts with the

introduction of ICT to f2f teaching. This is the most 'primitive' form of e-learning and it includes, for example, using a PowerPoint presentations when teaching in the classroom or using web pages with information regarding a certain subject. The central part of the 'timeline' regarding e-learning is occupied by hybrid teaching or the transitory approach to teaching. Online education as an independent form of teaching is located at the right end of the continuum (Fig. 2).

Fig. 2 *The e-learning continuum*



As Fig. 1. shows, e-learning and distance learning are often the same, although it has to emphasized that these are not the same forms of education. There are types of e-learning that are not done online, while there are also forms of distance learning that do not use ICT. Going from the left to the right on the 'timeline', e-learning is increasingly using ICT in educational categories (Elkins, 2015).

E-learning includes many different technologies and ways of communication between the student and the teacher, and this paper will present three types of e-learning:

1. Electronic learning done in the classroom with both the student and the teacher present. There are developed programs, some of them using for presenting the material without interaction, others with interaction – such as programmed tests – and the third option is to turn on the control of student's computers.
2. Independent use of prepared materials that are at another location. With this type of electronic learning, the materials are given to students on a flash drive or optic disk or the student uses them via Internet. This type of learning is an addition to classic teaching done in the classroom and it is known as blended learning or mixed more.
3. The entire learning process is thought out in such a way that it is done entirely online, and this means e-learning becomes one of the forms of distance learning. This is where Internet solves the problems of

communication between the institution and the student, as well as the distribution of materials in a comfortable way. This is the solution of the modern age, accepted by both the institutions and students.

We can say that two forms of e-learning that belong to the third type are trending today, and these are: Learning Management System (LMS) and videoconferencing via Internet. LMS is a system for managing the e-learning environment and it allows the following:

- Introducing e-learning participants into the system, as well as their organization through group membership
- Introduction of SCORM compatible interactive or passive content
- Organization of students, content and mentors per classes,
- Communication between participants
- Online teaching, testing, tracking, and statistics of working with groups of students

Videoconferences imply a two-way, simultaneous (synchronized) transfer of sound, picture and other data between two or more remote locations. Videoconferencing systems can be divided according to the number of participants into personal and group systems, which demands differently organized technical systems. Personal ones demand a personal computer, while the group videoconferences are done from specialized areas – classrooms for remote teaching – TCR (TeleConferencing Rooms). Group systems allow for a large number of participants, while the personal systems have a limited number of participants.

Development of e-learning technology

In the beginning of the development of e-learning in higher education institutions, e-learning mainly served as a place to store the virtual student and 'digital textbooks'. The teacher had difficulties updating the material on the server, and it was carried out using a manual method of content preparation in an HTML tool. PowerPoint presentations used to be converted into HTML pages. All the materials had to be transferred to the server via an FTP client. Communication between students was mainly performed via e-mail, and later in forums. Later, better solutions for content management systems started to appear, with the ability to change parts of the content on the server. The next step in the development was the emergence of systems that enable user/student registration, thus limiting the number of users to participants of the courses. Later developments include integration of system usage information, which made it possible to

keep track of when and what users of the system used. Such systems, which manage e-learning environment, are called LMS (Learning Management System) systems.

Courseware tools

It is impossible to imagine E-learning today without courseware tools. They are not a substitute for traditional books and textbooks, but only a supplement in the classroom. Courseware tools serve to provide a clearer presentation of the material, a different way of systematization of knowledge and a place for communication. They will never replace the communication with a 'human being'. All those tools depend on the teacher. If the teacher is good, they will help them be even better, if the teacher is bad, they will not help them get better, unless they work on materials, presentation methods and adjustment to the new medium. One definition of courseware tools is: Educational software designed for education. The term was coined by blending 'course' and 'software'.

All courseware tools consist of two parts: a space for the teacher and a space for the student. These two spaces are connected by knowledge. The space for students is designed for the best presentation of knowledge, while the space for teachers is optimized for the best knowledge input into this space. Further division of the space for teachers is: space for an author, a system administrator and a lecturer. A person who is the author of the material is not necessarily the person who will teach. People who are authors of the material are usually textbook authors and other people can help them with the input of the material, in case they do not possess sufficient computer skills. A new profession has been established in the world (designers of educational media) and specialists in this field are skillful in the adaptation of teaching materials to courseware tools. The role of a teacher is to teach the material, encourage communication and work with students to help them better understand the material.

The teacher can use the more advanced features of these tools to monitor students' progress, teach material by employing synchronous communication or participate in discussion groups. In order for those tools to work properly, an administrator is necessary. They are skilled in maintaining software and hardware equipment. The administrator monitors the operation of the entire system, assigns permissions to users and creates backups. Today, many courseware tools are available in the market, both commercial and free. Two best free tools are: Moodle and Claroline.

They allow the input of the desired content, displaying it to participants, discussion groups and assessment tests. Commercial solutions are very expensive, and are in accordance with the standard for data exchange. Some of the better known are: WebCT, BlackBoard and IntraLearn.

E-learning standards

Standards allow for a fast and painless transition from one courseware tool to another. Standard is very important in e-learning; it should be respected in order to avoid the situation in which some educational content developed in one tool is lost because the software maker discontinued it, which happens in the market. Currently, there is a number of standards in the market for exchanging content between courseware tools, but the most popular is SCORM (Shareable Content Object Reference Model) which represents a set of technical specifications based on the work of the AICC (Industry CBT Committee), IEEE LTSC (Learning Technology Standards Committee) and the IMS Global Consortium, and the idea was to create a single 'content model'. Specifications are developed through the SCORM initiative, a standard is still being developed and distributed by ADL (Advanced Distributed Learning) organization.

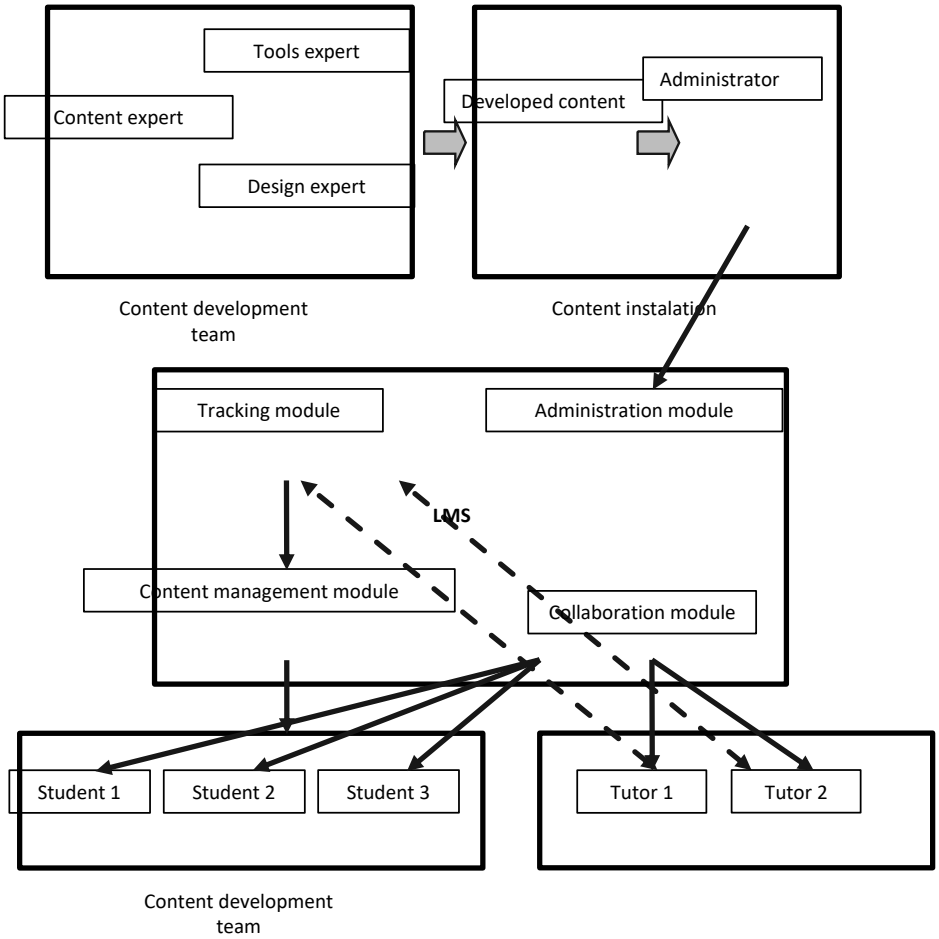
SCORM is a standard which enables the system for internet learning to import, export, use, share and find content in a standardized way. There are programs on the market that allow SCORM entry in accordance with the content, so it is not necessary to enter the content directly into the tool, which is sometimes challenging. IMS Global Learning Consortium has launched the project called the National Learning Infrastructure Initiative, sponsored by Educause, an organization for the promotion of educational technology. Today IMS has grown into an international organization for formal and corporate education.

Learning Management System (LMS)

Located at the top of the pyramid in the structure of e-learning. Today, no serious e-learning system can be imagined without such complex software. It enables the delivery of learning content, monitoring, reporting and administration of learning content, monitoring the students' progress, communication between mentors and students as well as among students (Figure 3). LMS features are: application and billing, testing, process control, user functions, monitoring and tracking and administrative functions (Horton, 2011).

Application and billing feature enables authorized application and verification of the application, and conducts billing (in case of public portals). The testing function is carried out through quizzes related to lessons, and tests, related to more lessons together. The function of managing the process of training refers to the modules, lectures and seminars. User functions allow users to plan and monitor their own development (communication with tutors and other members of the group, access to account status, online help, dictionary, and so on). Monitoring and tracking allows for picking members of the virtual class, monitoring the progress of each member of the group, communicating with all members of the virtual class. Administrator functions include activities such as content control, record keeping, backing up, reporting, and the like.

Figure 3 *E-learning and LMS*



Moodle

As the world's most popular and widespread educational platform, Moodle is placed among the top open source projects. Developer communities around the world contribute to the development of Moodle by adding new code and plugins every day. Excellent organization of comments within the code and its documentation by partner development programming communities outside of Moodle contribute to innovation in the field of development of educational software.

One of the innovative trends in Moodle is the introduction of badges for students. Functionality and application of badges as rewards for participants for achieving a high score on the basis of specified criteria and levels of knowledge encouraged the students to develop competitiveness, a better concentration and rigor in the application of knowledge. Badges are placed by teachers on the students' profiles and they are publicly available for all to see. There are two types of badges: at the level of Moodle website, which are used based on the activities of participants in all courses and at the level of the course, where each participant is awarded for the result achieved within a specific course.

Another way to motivate students, which proved to be the second most effective way, is to introduce games to Moodle. By installing the game plugin, teachers are able to motivate course students through game and development of competitive spirit. Some of the available games are crosswords, sudoku and Who Wants to be a Millionaire. The content of each game is exclusively linked to the subject to be treated in a given course. Motivation of the students increased by the wish to score the best results, the possibility of leveling up and, in case of a wrong answer, additional opportunities to repeat the current level, led to remarkable developments in online learning.

With the development of mobile technology and m-learning, Moodle also developed learning on the mobile phone as a way to motivate the students. The application is available for Android and iOS. The idea behind it is that participants do not have to be at their computers to learn. At any time, via a wireless network or mobile Internet, they can log in to their Moodle account and access the content of the course. As an improvement to m-learning, the participants are given an opportunity to use their mobile phone to post images, audio and video recordings as well as to add communication channels with other participants and teachers.

Conclusion

The traditional approach to teaching as a way of acquiring knowledge by transferring knowledge from the teacher to the student has weaknesses and shortcomings, especially due to the lack of encouragement for students to actively acquire the knowledge. The education system should raise the interest of students for independent learning and prepare them for lifelong learning that comes up as a necessary precondition for successful operation in the future knowledge society.

Although it is very often the case that students have more command over ICT skills than their teachers, international experience shows that the lack of ICT skills among teachers is not the main problem in the implementation of e-learning. The biggest problem is most often the lack of institutional vision and definition of guidelines for the use of new technologies in teaching, as well as the lack of adequate technical and professional support to teachers. It is, therefore, necessary for all levels of the education system (strategic, tactical and operational) to adopt a strategic document that will determine what is to be achieved by introducing ICT into the education process and developing a system of technical and professional support to teachers in the implementation of e-learning.

Establishing virtual universities, which offer full online education and obtaining qualifications through e-learning is the current world trend. These universities were often formed by the modernization of correspondence forms of teaching, and due to geographical features they have a long tradition and are very numerous in the United States and Canada. However, in recent years, the introduction of the system for distance learning and online education opportunities, there is a worldwide increase in the number of students who live far from educational institutions. E-learning and developed e-learning platforms, such as Moodle, encourage and motivate young people, as well as the elderly, to continue education.

Literature

1. Arshavskiy, M. (2013). *Instructional Design for ELearning.* CreateSpace Independent Publishing Platform.

2. Bates, A. W. (2000). *Managing Technological Change: Strategies for College and University Leaders. The Jossey-Bass Higher and Adult Education Series*. Jossey-Bass Publishers, 350 Sansome St., San Francisco.

3. Clark, R. C., Mayer R. E. (2011). *E – learning and the Science of Instruction.* Pfeiffer.

4. Clark, R. C. (2012). *Scenario – based e – learning: Evidence – Based Guidelines for Online Workforce Learning.* Pfeiffer.

5. Elkins D., Pinder D. (2015). *E – learning Fundamentals: A Practical Guide*. Association for Talent Development.

6. Grail Research (2011). *Consumers of Tomorrow – Insights and Observations About Generation* (25 Januar 2017) http://www.integreon.com/pdf/Blog/Consumers_of_Tomorrow_Insights_and_Observations_About_Generation_Z_246.pdf

7. Harrington, M. (2009). Tackling Generational Diversity, *Profiles in Diversity Journal*, 11 (2); 64-65.

8. Horton, W. (2011). *E – learning by Design.* Pfeiffer.

9. Hudson Jordan, T. (2010). The Diversity Opportunities of Today – It's Generational, *Profiles in Diversity Journal*, 12 (1); 46.

10. King, K. (2009). Generational Diversity in Today's Workplace, *Profiles in Diversity Journal,* 11 (6); 45.

11. Levickaitė, R. (2010). Generations X, Y, Z: How Social Networks Form the Concept of the World Without Borders (The Case of Lithuania), *LIMES*, 3 (2); 170-183.

12. Meister, J. C., Willyerd, K. (2010); *2020 Workplace*, New York, Harper Business.

13. Montana, P. J., Petit, F. (2008). Motivating Generation X and Y on the Job and Preparing Z, *Global Journal of Business Research*, 2 (2); 139-148.

14. Prensky, M. (2001). Digital Natives, Digital Immigrants, *MCB University Press*, 9 (5); 1-6.

15. Rice, W. (2015). *Moodle E – Learning Course Development – Third Edition.* Packt Publishing - ebooks Account.

16. Soleša, D. (2006). *Konceptualni osnove standarada informatizacije obrazovanja,* Monografija, Evropske dimenzije promena obrazovnog sistema u Srbiji, Filozofski fakultet, Novi Sad, str. 263-274.

17. Stevens, R. H. (2010). Managing Human Capital: How to Use Knowledge Management to Transfer Knowledge in Today's Multi-Generational Workforce, *International Business Research*, 3 (3); 77-83.

18. Yu, H., Miller, P. (2005). Leadership style – The X Generation and Baby Boomers compared in different cultural context, *Leadership and Organization Development Journal*, 26 (1); 35-50.

19. Zemke, R., Raines, C., Filipczak, B. (2000). *Generations at Work: Managing the Clash of Veterans, Boomers, Xers and Nexterst in Your Workplace*, New York, AMACOM.