

Knowledge and Skills of the Teachers, Necessary for Ensuring the Effectiveness of e-Learning

Mariyana Nikolova, Margarita Todorova, Donika Valcheva

Abstract: *The main goal of the report is to present the necessary knowledge and skills for applying the ICT, which the modern teachers working in all the educational levels have to possess, in order to apply these innovative technologies directly in the teaching process. The existing e-learning technologies and their application in the different educational levels are presented.*

Keywords: *education, teachers, computer knowledge and skills, integration of information and communication technologies, ensuring the effectiveness of e-learning*

INTRODUCTION

The term “technology in the education” is extended and this finds an impression in the direction of the system analysis and the teaching process projection with the tools of the information and communication technologies. To the modern pedagogical science is set the actual task to educate and prepare the rising generation in order actively to participate in the new stage of the society development, related with the automated process.

A lot of research work about the effectiveness of e-learning has been made the last few years. One of the reasons for this is that the implementation and usage of the e-learning systems and applications requires large investments of time and money.

The term “effectiveness of e-learning” is abstract and there are a lot of definitions, which differentiate from each other mostly because they offer various factors for its defining and assessment.

In this report we accept the following concept - the effectiveness of the e-learning in the modern education can be guaranteed if all the components in this process (teachers, students and software developers) possess the necessary characteristic, knowledge and skills.

The five fundamental aspects of e-learning are organizational, technological, curriculum design, instructional design, and course delivery (delivery system). The different delivery systems have various methods for data collection.

By the usage of e-learning technologies, the exchange of the information is realized in a higher degree. This lets to some requirements for the teachers and students and undertakes shared responsibilities in the process of teaching and training. In order the potential of these innovative technologies to be used in the most appropriate way, some competencies for working with them are necessary.

Some of the success factors for e-learning are leadership issues and competent, knowledge and skills of the teachers, necessary for ensuring the effectiveness of e-learning. It is crucial to include the staff in the changing processes in education. It is also important to appreciate the motivation of learners.

The goal of the report is to define the necessary basic and specific skills and competencies of the teachers in using e-learning technologies and their usage in the different educational levels.

BASIC, SPECIFIC AND DIDACTICAL COMPETENCES, KNOWLEDGE AND SKILLS OF THE TEACHERS FOR ENSURING THE EFFECTIVENESS OF E-LEARNING

■ **Teachers' basic competences, knowledge and skills**

The teacher plays a key role in the development and management of the teaching process using ICT. The main difference between the electronic form of teaching and the

traditional one is the transformation of the didactical approach “teaching by narration” into teaching, orientated towards the students.

The application of the e-learning technologies can be discussed in two aspects: firstly the educational practices, which are orientated towards applying the interactive multimedia in order to present more attractively the teaching content and secondly the web-based forms of didactical materials and tools and their implementation as interactive multimedia projects. Figure1 shows the existing e-learning technologies and their application in the different educational levels.

For the right apply of the modern ICT like e-learning in the teaching and learning programs, didactical criteria for their applying have to be involved:

- ❑ **Effectiveness and expedience.** An important aspect in applying the e-learning technologies in the education is their effectiveness and expedience. The teachers have to be able to access and use the e-learning tools.
- ❑ **Pedagogic competence** The pedagogic competence is defined from the teaching content, the concrete didactical goals and the age of the trainees. The usage of the ICT have to be implemented from the teacher of the concrete disciplines, who must know when, where and how to apply them in his daily work.

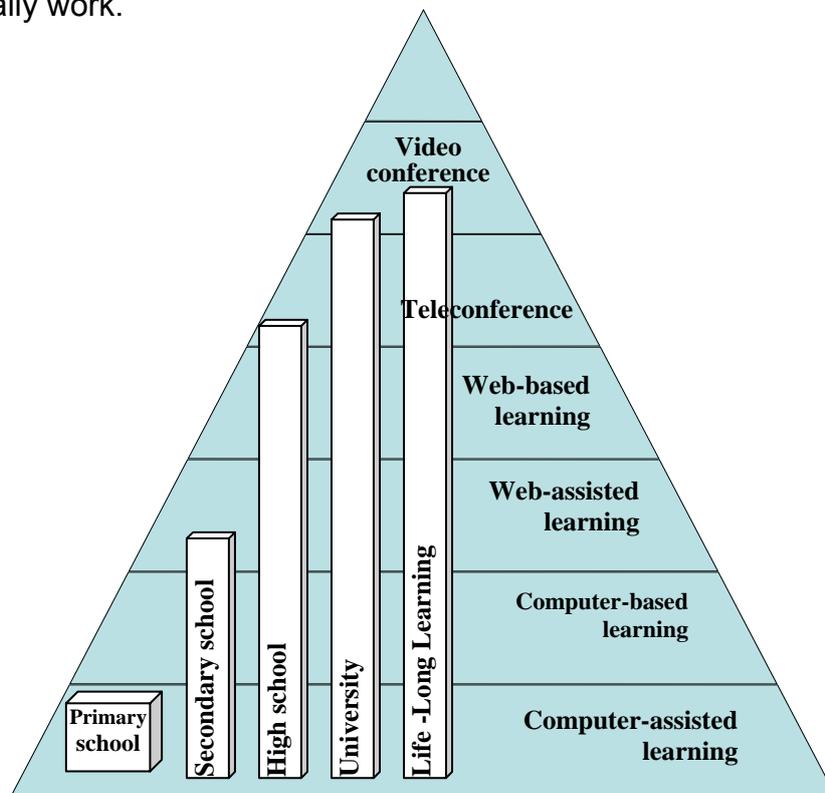


Fig.1. The e-learning technologies and their usage in the different education levels

The necessary competences knowledge and skills, which the teachers needs, in order to use the e-learning technologies in the different education levels are:

- ❑ **Basic knowledge and skills for working with a multimedia computer system, which are necessary in** computer-assisted learning and computer-based learning;
- ❑ **Basic knowledge and skills for working with the Web environment, which are necessary in** Web-based learning, Web-assisted learning, Teleconference, Videoconference.

Basic knowledge and skills for working with a multimedia computer system are [4]:

- ✓ Fundamental knowledge about the advantages of the ICT integration in the teaching process;

- ✓ Knowledge about the methods and tools for data accumulation, preservation and operation;
- ✓ Knowledge about the computer system organization – technical equipment and work principles;
- ✓ Knowledge about the basic peripheral devices, which are part of the modern multimedia computer configuration;
- ✓ Knowledge and skills for applying the program tools, which maintain the computer system;
- ✓ Knowledge about the potentiality of the software applications, with common purpose for text processing, creation and processing of graphical images and electronic tables;
- ✓ Skills for developing presentations with teaching content;
- ✓ Skills for applying the basic ways for communication and data searching in the Internet environment

Basic knowledge and skills for working with the Web environment are:

- ✓ Capabilities for working in a visual environment;
- ✓ Knowledge about the current electronic tools with teaching content and skills for applying them in their daily work;
- ✓ Knowledge about the program environments for development of Web-based applications and skills to prepare such materials;
- ✓ Knowledge about the potentiality of the electronic devices for communication in real time;
- ✓ Skills for knowledge transfer.

■ **Teachers' specific knowledge and skills**

The usage of technical tools and electronic forms in the teaching process require additional skills that the teachers have to possess [4]:

- ✓ To organize and manage the electronic course (e-course);
- ✓ To orientate the trainers in the teaching process;
- ✓ To give clear instructions, if it is necessary, how the technical tools can be used more efficiently;
- ✓ To encourage the students' cooperation and participation in the discussions and teamwork;
- ✓ To ask questions and point the accents;

The modern e-learning technologies may be used for solving some problems and difficulties in the traditional way of teaching. In order the ICT to be used successfully in the teaching process, **the teachers have to know:**

- ✓ The appropriate technical equipment and the basic program tools for maintenance of the computer system; the potentiality of the software applications, with common purpose, creation and processing of graphical images and electronic tables;
- ✓ The potentiality of the software applications, with common purpose for development of presentation materials with teaching content;
- ✓ The basic ways for communication and data searching in the Internet environment and the current electronic tools with teaching content; program environments for uploading in Internet Web-based materials;

The teachers' qualification includes not only perfect knowledge about the teaching matter, but also such skills as adaptability, mobility, communication ability and technical literacy. These skills can be elaborated and expanded by self-learning, qualification courses and distance learning.

The work with computer and the skills to use the information and communication technologies in a concrete professional sphere is a very important qualification. The basic computer knowledge and skills can be obtained from: the school and the

university, self-teaching, specialized qualification courses for applying the ICT in the teaching process, other ways.

Some of the serious disadvantages of this qualification process are the following:

- ✓ For the teachers with a long practice teaching it is difficult to adapt to the technical system and the new information environment;
- ✓ The trainers sometimes are not very good specific qualified (pedagogical and technological);
- ✓ The groups of the trainees are formed without a serious examination for their preliminary computer skills and knowledge.

The principle for mastering the knowledge in the field of computer and communication technologies in the direction of workability of this knowledge in the profession of the future pedagogues is applied in the continuous actualization of the school plans and programs in the computer university disciplines [2]. The motivation and the requirements of the students (future pedagogues) are the most important factor for their mastering in that area. From one side are the disciplines, giving the necessary knowledge and skills for working in a computer-communication environment and applied software as an instrument for automation of the information activities and on other side are the disciplines, related with the usage of specialized program platforms as a teaching tool that will be applied for their future work. This, in the maximum rate, regulates the workability and the effectiveness of the teaching process in the different specialties [7].

The future pedagogues should be taught to use the different program tools in concrete activities and aspects. The types of the program tools that may have place in the school schedule in the school, according to their functional purpose are:

- ✓ **Pedagogical** program tools (applied programs), intended to present the course material and to manage the teaching process;
- ✓ **Diagnostic, testing programs**, that aim at finding the reasons for the wrong behavior of the students, assessment of their knowledge, skills, determination of the level of their preparation and the level of their intellectual development;
- ✓ **Instrumental program tools** – for constructing program tools with teaching purpose, preparation and generation of methodical and organizational materials, creating graphic, sounds, etc.
- ✓ **Subject-oriented environments** – for modeling the studied objects and their relation in a program environment.
- ✓ **Program tools for atomization** for processing the scientific experiment results.
- ✓ **Management program tools** – their aim is to manage real objects (for example robots' activities)
- ✓ **Program game environments** – for cognitive activities by different types of games with computer.

The necessity of lifelong qualification makes every person, including the teacher, student till the end of his life.

■ **Didactical aspects necessary for ensuring the effectiveness of e-learning**

By applying the e-learning in the education is ensured flexibility – adapting to different situations, needs, etc. and accessibilities – opportunity to study in any moment and in any time. It is necessary the content and the tools for teaching and understanding to be deeply taken into consideration, in order the most effective way for the concrete theme and subject to be applied [1], [6].

Before the usage of the computer and their potentiality in a proper way, the teachers have to transform the technique in convenience, in order to be appropriate teaching tool. The instructors have to be free to define what is important and how to

apply it in their work and creatively to combine the classical with the new tools and forms of the education [5].

The aim of the disciplines, related with the use of e-learning as a teaching tool is not only the technical knowledge and skills for working with the program teaching platforms, but also they have for an object to convince the teachers, to motivate them and to show them the advantages and the necessity from the modern tools and forms of education

The basic aspects in using the ICT in the education are:

- **Directly in the teaching and learning process** – when new knowledge have to be presented, also when practice and control of the results from the teaching process have to be implemented. The usage of ICT directly in the school process makes them an instrument, by which it is taught and the students can learn. This is more and more observed as a practice in the class, because the teachers realize the great effect and the advantages of this practice
- **For self-learning** by realization of the potentiality of the ICT in the learning systems.
- **For distance learning** by using the tools of the Internet technologies.
- **For preparation of course materials** - by the usage of object-oriented program tools and software platforms (specialized applied software or with common purpose) for preparing different course materials and subsidiary documents with the aim to form school activity culture from the side of the teachers and directed to the students.

Didactical parameters and indicators of the e-learning courses

In order the necessary knowledge and skills to be successfully overcome and the goals of the e-learning courses to be reached, a very professionally structure has to be developed. This structure has to be developed according to the following parameters and indicators – Figure 2:

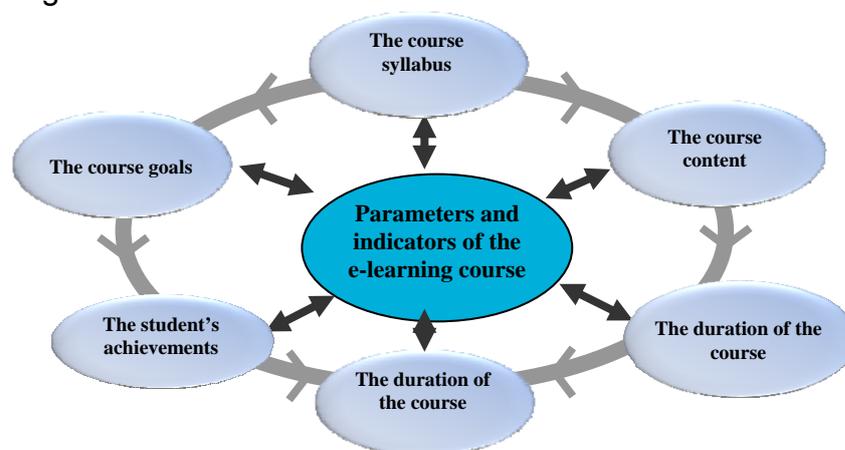


Fig.2. Parameters and indicators for ensuring the effectiveness of the e-learning courses

- **The course structure** has to be actual, in accordance with the needs and capabilities of the students
- **The course content** has to be defined before the teaching process itself and after an analysis of the specific features of the students (specialty, qualification, level of the knowledge and skills in the field of the computer science and technologies); the application of the computer systems and technologies in the concrete professional environment, as well as of the concrete problems, that this study must be able to solve. The analysis have to distinguish the concepts “must know” and “it will be better to have knowledge about...” This content has to define the concrete knowledge, skills and habits that the students are required to have, after finishing the course.

- **The course goals** have to be clearly defined.
- **The student's achievements** are based on concrete knowledge and skills. The students have to be assessed according to preliminary determined standards.
- **The duration of the course** has to be flexible;
- **Personalized teaching** - the tools for self-teaching help the students to study according to their capabilities and free time, to choose the form and the way of providing the material on the basis of their needs. When the student reaches the goals of the current stage of the teaching process, he has to be directed to the next stage.

CONCLUSIONS AND FUTURE WORK

The effective use of the computer in all the levels of the education and training is subjected to the teachers, and this depends on their computer skills and confidence in the usefulness in using the new technologies in the school process. This process has to be adequate and dynamic and the results have to be continuously assessed, in order the tools to be improved.

An object of this report is the necessary knowledge and skills, which the teachers have to have, in order to use the e-learning in the different educational levels and also the ways for this knowledge acquiring.

Contributions of this report are: the concrete knowledge and skills for applying the ICT, which the modern teachers working in all the educational levels have to possess, in order to apply these innovative technologies directly in the teaching process; concrete didactical parameters and indicators for structuring effective e-learning courses are pointed.

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ABOUT THE AUTHORS

Assoc. Prof. Dr. Margarita Todorova, Head of Computer Systems and Technologies Department, St. Cyril and St. Methodius University of Veliko Turnovo, Bulgaria, Phone:+359 62 649831, E-mail: marga_get@abv.bg

Assistant Prof. Dr. Mariyana Nikolova, Computer Systems and Technologies Department, St. Cyril and St. Methodius University of Veliko Turnovo, Bulgaria, Phone:+359 62 649831, E-mail: mnikolova_vt@abv.bg

Assistant Prof .Donika Valcheva, Computer Systems and Technologies Department, St. Cyril and St. Methodius University of Veliko Turnovo, Bulgaria, Phone:+359 62 649831, E-mail: donika_valcheva@abv.bg.