EDUCATION IN THE 21ST CENTURY - PEDAGOGICAL APPROACHES IN DIGITAL ENVIRONMENT. 'E-TEACHER' INFORMATION SYSTEM

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ABSTRACT: *Our current 21st century workplace requires workers to master the skills that are essential in a knowledge-based society. The 21st century youths need many sets of special skills in order to succeed in work and life. Educational systems must transform their objectives, curriculum, pedagogies, and assessments to help all students achieve the outcomes required for a prosperous, attractive lifestyle. Therefore, to accomplish this we must transform children's learning processes and engage student's interest in gaining 21st century skills and knowledge.*
*Things have changed, old methods and **pedagogies** are no longer relevant.*
The urgent questions we should, as educators, ask ourselves are: "What are the driving factors behind this huge transformation in learning?" and "Do we need a new pedagogy to better enhance learning ?"
The present article introduces a key subsystem from the integrated management information system of Veliko Tarnovo University, namely the 'E-teacher' subsystem.

Keywords: information system, 21st century pedagogy, blended learning

1. Introduction

Computers and the Internet are part of the environment in which young people learn and live. Undoubtedly, the development of technologies brought to changes upon the traditional learning environment. In the past few years, governments have been seriously investing in information and communication technologies (ICT) at universities. The quality of educational resources has been significantly increased. However, international studies (Innovating Education and Educating for Innovation: The power of digital technologies and skills © OECD 2016 http://www.oecd.org/edu/ceri/GEIS2016-Background-document.pdf, p.9) establish that digital technologies are not yet completely integrated in the teaching and learning process. A part of the explanation for this limited success is that schools and educational systems are still not ready to realize the potential of technologies. The insufficient pedagogical training on how to use technologies during the teaching process, the gaps in lecturers and students' digital knowledge, the difficulties in the need to find high quality digital learning resources and software, the lack of clarity in relation to educational goals all lead to a disparity between expectations and reality. Universities shall respond to these challenges, otherwise technologies may cause more harm than benefits. Despite not being able to transform education by themselves, digital technologies have a great potential to change teaching practices and open new horizons. The challenge of achieving this transformation is rather oriented towards **searching for ways to improve teaching and training skills in universities with the help of technologies.**

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2. MATERIALS AND METHODS

- The challenge in the paper is rather oriented towards searching for ways to improve teaching and training skills in universities with the help of technologies.
- Brief comparative analysis of traditional and electronic education is made.
- The present article introduces a key subsystem from the integrated management information system of Veliko Tarnovo University, namely the 'E-teacher' subsystem.
- The experience of the University of Veliko Tarnovo related to the application of pedagogical approaches in digital environment is shared in the article. In our opinion, the success of blended learning depends on: the organization of learning, quality of the virtual environment and the degree of students' and lecturers' preparation in a virtual environment.

3. RESULTS AND DISCUSSION

3.1. Basic Technology Concepts

But the thing is, teaching new skills is not the only solution and there is more to it than just that, in fact we need a new **pedagogy** with specific features that would cover every learning aspect.
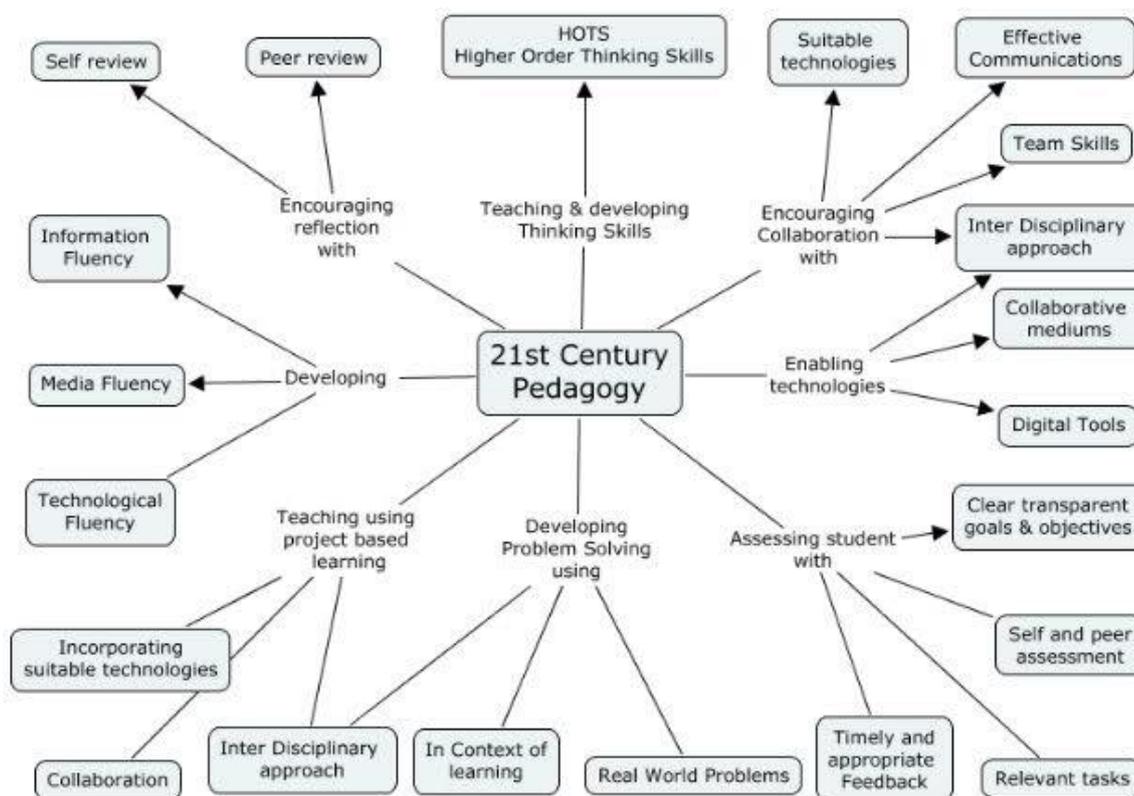

Fig. 1. 21st century pedagogy
(Churches A. http://www.educatorstechnology.com/2011/01/21st-century-pedagogy-teachers-should.html)

Advancements in **technology** and in particular **social networking technologies** are changing the whole educational framework. Users now can have access to information whenever and wherever they want. See a diagram (fig.1) provided by Andrew Churches that summarizes most of the features concerning the 21st century pedagogy.

It is evident now that we are in front of two different versions of learning - the first one is called the 20th century learning and the second one is called the 21st century learning. These two learning paradigms are totally different in terms of **skills,** objectives, and methodologies of instruction employed in each one of them. But the thing is teaching new skills is not the only solution and there is more to it than just that, in fact we need a new **pedagogy** with specific features that would cover every learning aspect.

So you are coming across so many tech terms that it becomes hard to draw clear boundaries between what each of them refers to. We put forward a list of the major and most popular educational concepts that are technology-related. With the advance of technology and its full embrace in education, many new learning and teaching concepts have being created to the point that it becomes very hard to keep up with the new releases.

A **virtual learning environment** (VLE) has specific characteristics. Information and socialization places, and where students are not only active but also actors; they are not restricted to distance education but integrate multiple tools, complement the physical space of the classroom. A virtual learning environment is a set of teaching and learning tools designed to enhance a student's learning experience by including computers and the Internet in the learning process (Loureiro and Bettencourt, 2014, p. 98). Much of our daily activity occurs in the virtual environment, using online tools, Almost every person has a virtual profile on any social network; which may have a more or less informal dimension. There are social networks of professional, academic, social or entertaining, levels which are used by almost everyone, regardless of age, gender or social status. In the educational sector social networks, web tools, collaborative virtual environments and virtual worlds, have been gradually introduced. Educationists have started to use learning management systems (LMS) and learning content management (LCM) allowing teachers to share documents to support their classes. In learning management systems (LMS) students can only share information if the teacher set this option, which does not always happen. In most cases, students use the platform to access documents made available by the teacher. More recently, web tools, social networking and collaborative virtual environments have been integrated into the learning environment, bringing changes so great that, in the near future, we will not imagine ourselves teaching without them.

There are three aspects that define the **social online educational environments**:
- The ability to collaborate with others both synchronously and asynchronously;
- The ability to create a personal profile built just around educational curriculum, making it easier to find other people, resources, events and discussions around the same interests;
- The ability to more easily search, find, organize, manage and share information and content.

Learning does not only depend on the individual's ability to acquire, store and retrieve knowledge. It depends on a network of learning that occurs through different interactions with different knowledge sources, including the Internet and LMS. It depends on the participation in communities of practice and learning and on social networks, and through the completion of group tasks through collaborative and cooperative work. Social interaction may be the key element to determine the success or failure of an online community.

The main benefits of **collaborative learning** are:
- the development of critical thinking skills;
- reflection;
- the co-creation of knowledge and meaning;
- transformative learning.

The social component is often referred to as being important for the development of new skills and learning. Web 2.0 tools and virtual worlds bring many benefits to students in terms of learning, which may be summarized down into:
- learning through encouraging participation in the creation and editing of content;
- collaborative learning, provided by the collaborative construction of knowledge where the information shared by each individual can be recombined to create new forms, concepts, ideas and services;
- autonomous learning in order to (с цел да се) share, communicate and find information on learning communities;
- ability to communicate and interact, creating richer opportunities through socialization and integration into learning communities;
- lifelong learning, by the development of digital skills.

The extended classroom is defined with these principles in order to foster online collaboration on a massive scale among regular and adult learners.

We understand **blended learning** (b-learning) as a learning environment that combines both online and face-to-face approach, in which the time spent in a physical classroom are smaller.

A blended learning approach has the following features:
- learner-centered, a more active and interactive learner, whether in a classroom setting or online environment;
- greater interaction between learner-learner, learner-teacher, learner-content and learner-external sources of information;
- integration of formative and summative assessment systems.

The contexts of blended learning also develop skills in digital literacy, critical in today's society.

Digital literacy refers to skills, understandings, and reflective approaches necessary for an individual to operate comfortably in information-rich and IT -enabled environments. Digital literacy is then the ability to read and interpret media, to reproduce data and images through digital manipulation, and evaluate and apply new knowledge acquired in digital environments; the ability that an individual has to play effectively tasks in digital environments.

Digital literacy involves:

- know how to access information and learn how to collect it in online environments;
- organize and manage information to be able to use it in the future;
- evaluate, integrate, interpret and compare information from multiple sources;
- create and generate knowledge by adapting, applying and recreating new information;
- communicate information to different and varied audiences, through appropriate means.

The integration of blended learning approaches facilitates the development of skills of digital literacy, beyond the specific competences in any particular subject or course. A b-learning approach is more flexible concerning time and space.

It also makes it possible for students to develop formal skills and competencies of socialization and collaboration beyond the development of skills in digital literacy. Virtual worlds allow very rich immersive sensory experiences, authentic contexts and activities for experiential learning, simulation of role-play, modeling of complex scenarios, etc.., with opportunities for collaboration and co-creation.

3.2. Electronic learning. From Web 2.0 to E-learning 2.0

E-learning is defined as the use of new multimedia technologies and the Internet to improve the quality of learning and facilitate access to resources and services, as well as long distance exchange and collaboration (Ravanelli and Serina, 2014, p. 1776).

Nowadays, the variety of different kinds of E-learning systems is very large. There are systems which support individual learning, collaborative learning, learning content management, learning activity management, formal learning, informal learning, and workplace learning (Benta, 2014).

E-learning and online learning represent important opportunities for universities to favour a more comprehensive, open and democratic access to learning resources The university often chooses "hybrid" formats, in particular with regard to distance and face-to-face teaching (Ravanelli and Serina, 2014).

These solutions are described as "**blended learning**", and combine online research and in-classroom activities. These modes can be grouped into three main categories (Ravanelli and Serina, 2014):

- Augmented – the use of technology to extend a physical classroom;
- Blended – technology partly replaces in-classroom learning. Part of the course is face-to-face and part is online;
- Online – technology entirely replaces face-to-face classroom teaching or paper-based distance education.

Learning theories

It is possible to identify five main learning models (Ravanelli and Serina, 2014):
- Behaviourist – based on a stimulus-response process;
- Constructivist – stresses the active role of the learner in organising their own net of concepts on the basis of past and present knowledge/experiences;
- Situated – based on the dynamic adaptation or contextualisation of behaviours to the context and circumstances;
- Informal – develops outside of the courses and the environments specifically created to the learning purpose;
- Collaborative – interaction and social dimension of learning.

Collaborative learning is a social activity which is based on the construction of shared knowledge in collaborative problem solving. In collaborative learning the learners look for information in the internet, discuss it together, summarize and present it, constructing a discourse. This gives the teacher the possibility to motivate the students and guide them imperceptibly, creating the effect of social presence from anywhere in the world (Kapenieks, 2013). Two contrasting approaches to design exist — for acquiring multimedia knowledge and for constructing multimedia knowledge. Two approaches to multimedia design correspond to them (Kapenieks, 2013):

- Technology–centred approach, seeking an answer to the question "How can we use the available technological resources for our needs?" Its aim is access to information;
- Learner–centred approach, seeking an answer to the question "How can we adapt the available technological resources in order to improve the learning process?" Its aim is support to knowledge construction and acquisition.

An approach must be applied that moves from a linear direction based on a one-way (teacher-learner) relationship to a co-constructing dimension, which is typical of active learning and net-social learning. It is possible to outline a further evolution of learning supported by technology as shown in figure 1. It moves from the TEL (Technological Enhanced Learning) approach to the WEL (Web Enhanced Learning) approach, and finally arrives at the NCL (Networked Collaborative Learning) approach.
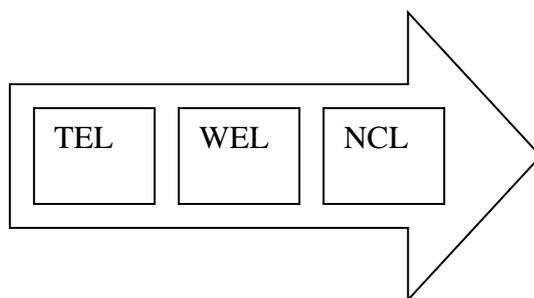
Fig. 2. The e-learning evolution (Ravanelli and Serina, 2014, p. 1777)

From Web 2.0 to E-learning 2.0 (Pieri and Diamantini, 2014)

The term Web 2.0 was created in 2004 by Tim O'Reilly and Dale Dougherty from O'Reilly Media, an American publisher specialized in publications concerning the new technologies and networks. The term Web 2.0 refers to the so-called second generation Internet services such as, for example, blogs, google (not only as a search engine, but also as an instrument for document sharing), skype, facebook, youtube and others. The Web 2.0 is an easy-to-use instrument which emphasize collaboration and sharing among users. The Web 2.0, not only allows for content sharing, collaboration and communication among users, but also lets users, even those with little experience with ICTs, produce contents. The use of Web 2.0 in learning environments allows all the actors involved (teachers and students) to actively participate in the learning process, giving them the possibility to generate and propose contents, to stimulate discussions, to create real learning communities.

With the introduction of the ICTs in education, over the years many changes of extreme importance have taken place. In the past the teacher was the key figure for the student, starting from a rigid hierarchical teacher-student model to one now in which the contribution of all participants, teacher and students, is valued.

Every individual with his personal characteristics tends more and more to construct a personal learning environment which interacts with an ever growing number of technologies and social networks. The students of an online course may show many individual differences (physical, psychological, visual, auditory etc.), as well as different learning styles and different types of intelligence. Differences may be noticed in their competencies and skills with regard to the use of the technological tools. E-students are scattered in areas that may be geographically very distant, and the pace of learning will depend on their own work or family life.

From an e-learning 2.0 viewpoint, conventional e-learning systems were based on instructional packets which were delivered to students using assignments. Assignments were evaluated by the teacher. On the contrary, the new e-learning has an increased emphasis on social learning. In e-learning 2.0 the learning takes place through conversations about content and grounded interaction about actions and problem.

There is also an increased use of virtual classrooms as an online learning platform and classroom for a diverse set of education providers. In addition, social networks have become an important part of e-learning 2.0 in virtual classroom environments. Social networks, now part of the everyday life of our students, have been used to foster online learning communities around objects as different as test preparation and language education. Social networks have the potential for the communication and dissemination of information (for example all our students have a facebook profile, and most of them are always and everywhere connected to facebook through their mobile devices.). We have witnessed the spread of **social e-learning**. Within a social network, users can share any type of file, comment, leave comments, and build large media groups. In education, social networks allow teachers and students to build learning environments because they favor the sharing and co-construction of meanings. Social networks are particularly suitable for the exchange of ideas,

opinions, experiences while facilitating informal interactions, connections and contacts between people.

3.3. Blended learning

Distance education is one of the alternatives against traditional instruction. Distance education is categorized into five generations, namely correspondence, broadcast radio and television, open universities, teleconferencing and the Internet/Web. The basic idea behind the distance education is common in all generations that make it possible to teach and learn while student and teacher are at different places. The spread of the Internet increased the popularity of distance education and created new terminologies like *online learning*, *e-learning* or *web-based learning*. **Online learning** is defined as the use of Internet to access learning materials; instructors and learners interact with the content. One of the most important debates is about whether students can learn better in the online learning environment compared to traditional classroom environment. In **blended learning**, the main idea is to benefit on the good sides of both approaches (Güzer and Caner, 2014, p. 4596-4597).

Definition

Blended Learning is provided by the effective combination of different modes of delivery, models of teaching and styles of learning, which are exercised in an interactively meaningful learning environment (Kaur, 2013, p. 612). Blended Learning courses combine online and classroom learning activities and uses resources in an optimal way in order to improve student learning outcomes and to address important issues. Blended Learning can be defined as the organic integration of thoughtfully selected and complementary face-to-face and online approaches and technologies. In general terms, blended learning combines the online delivery of educational content with the best features of classroom interaction in such a way as to personalize learning.

As mentioned before, blended learning models are often formed by combining face-to-face education and another popular education form: e-learning. Using a combination of face-to-face education and e-learning provides better teaching and learning experiences. Figure 1 shows a diagram of the blended learning formed with face-to-face education and e-learning (Köse, 2010).
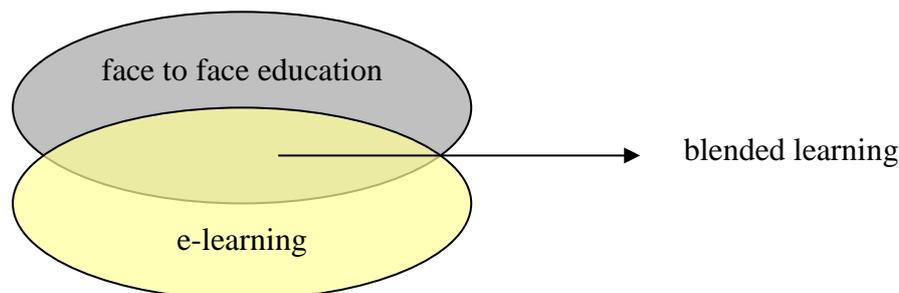

Fig. 4. A diagram of the blended learning formed with face-to-face education and e-learning
(Köse, 2010, p. 2796)

Definitions of blended learning from different perspectives are as follows (Kaur, 2013):

Holistic Perspective - using multiple media. This includes the integration of instructional media into a traditional classroom, or into a distance learning environment. It also includes any combination of media, whether synchronous or asynchronous media.

Educational perspective - blended learning means courses that integrate online with traditional face-to-face class activities in a planned pedagogically valuable manner. A portion of face-to-face time is replaced by online activity. It is focused on integrating two separate paradigms, the classroom – synchronous, and online – asynchronous.

Pragmatic perspective - Courses that are taught both in the classroom and at a distance, and that use different pedagogic strategies

- To combine various pedagogical approaches such as behaviourism, constructivism, cognitive learning approaches to produce an optimal learning outcome with or without the use of instructional technology.

- To combine any form of instructional technology such as films, CDs, web-based training with face-to-face instructor-led programming.

- To mix or combine instructional technology with actual job tasks in order to create integration between learning and working.

Corporate training perspective - The use of multiple instructional media to deliver one course or curriculum involving pre-reading, lectures and role play practices.

Review of blended learning with respect to its past, present, future (Güzer and Caner, 2014)

Past of the blended learning

Blended learning has became the center of attention at the beginning of 2000 while scholars were debating on the best environment for students.

- *First attempts* (1999-2002)

First attempts on the idea of blended learning began in 2000. They aimed to combine elements of play and work in a pre-kindergarten school in order to acquire blended activities. It is far from the general use of blended learning, but it is still important to apply the idea of blending learning.

- *Definition period* (2003-2006)

This period (2003-2006) is named as Definition period because the most frequently cited articles are on defining blended learning. In 2003 Russel T. Osguthorpe and Charles R. Graham suggested three different blending models that are blend of learning activities, blend of students and blend of instructors.

In the first model, the same students can benefit from both activities in a face-to-face classroom and activities in online-learning environment.

In the second model, they suggested that students in the face-to-face classroom can be blended with different students in the online-learning environment.

In the third model, they suggested that students in the face-to-face classroom can benefit from other instructors through online-learning environment.

In 2004 Garrison and Kanuka stated that "blended learning is the thoughtful integration of classroom face-to-face learning experiences with online-learning experiences." (from Güzer and Caner, 2014, p. 4598).

- *Popularity period* (2007-2009)

In the Popularity period, it is observed that there are two general points that have got attention by scholars - *perceptions* of participants on blended learning and *effectiveness* of blended learning.

Perceptions - Scholars are curious about perceptions of students and other participants on blended learning. In popularity period, four articles are reviewed which study participants' perceptions on blended learning. The general conclusion in all studies indicated that students favored web-based online-learning environment as effective but they did not want to give up the face-to-face component of the course.

Effectiveness - In all the analyzed studies from the popularity period of blended learning, scholars measured effectiveness of blended learning with different variables such as satisfaction, motivation, achievement, attitude, cooperativeness, knowledge retention, critical thinking skills and drop-out rate for at-risk students. The general findings indicate that there is no significant difference in achievements of students between blended learning and traditional learning but on other variables

like satisfaction, motivation, etc., blended learning is observed as superior. Furthermore, no significant effect has been observed on critical thinking skills of students in a blended-learning experiment.

Present of the blended learning

Studies on blended learning are examined with respect to articles published within the three years (2010 – 2012). In summary, it is observed that blended learning is getting increasing attention and studied in different areas on different variables. One thing is common in all studies: it is preferred by the participants, but it should be studied carefully in order to benefit more from it.

Future of the blended learning

Usually blended learning is perceived as useful, enjoyable, supportive, flexible and motivating for learners. But these qualities are not sufficient enough to create an atmosphere for successful learning. In other words, in order to create a positive learning environment, teachers using blended learning environments should encourage students for more participation in the environment and should find ways of creating social interaction through more collaboration.

Moreover, the near future will be dominated by tablets, smart phones and touch screen devices, that will be some of the next interests to be studied in blended learning courses.

Components of the Blended Learning Model (Kaur, 2013)
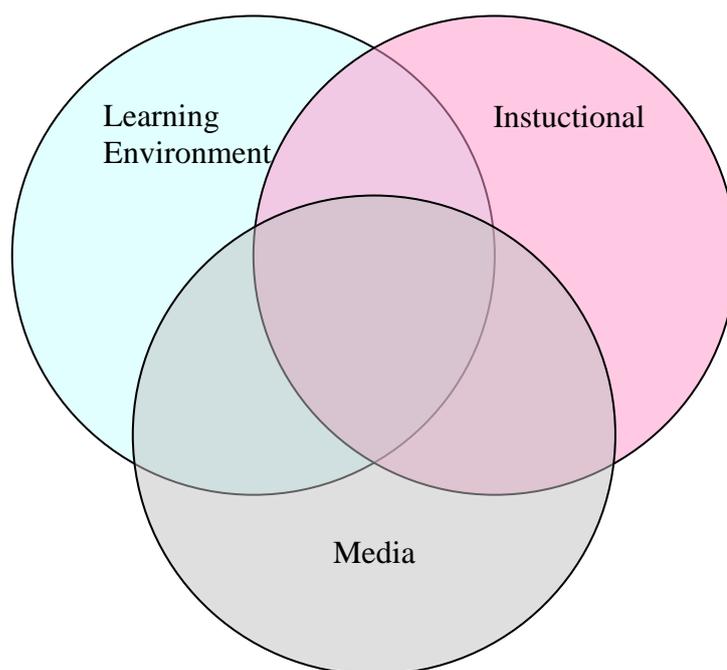
The components are as shown in Figure 5:

Fig. 5. Components of Blended Learning (Kaur, 2013, p. 613)

Learning environment component - a learning environment can either be synchronous or asynchronous. Each learning environment has distinct advantages and disadvantages. The goal of blended learning is to leverage the specific positive attributes of each environment, to ensure the optimum use of resources, to attain the learning objectives.

Media component refers to vehicles that simply deliver content. Some instructional media, however, may be more appropriate in supporting either a synchronous or asynchronous learning environment in one or another situation. But no single medium is inherently better or worse than any other.

Instructional component - This component is used to select the most appropriate instructional strategies that support learning objectives. When developing blended learning, maintaining instructional quality is paramount.

Synchronous instructional methods

Methods in this domain consist of traditional classrooms, virtual classrooms, live products, practice labs, interactive chatrooms and mentoring.

Traditional classrooms allow instructors and learners to be face-to-face in the same place.

Advantages - learners have access to peers and experts. Group discussion and practice can be engaging and add additional interest to a topic.

Disadvantages - Classroom training can be expensive if learners must travel to the classroom location. If the session is lecture-based, discussion and interaction are reduced. Classrooms can place learners in a passive role and their attention may be lost.

A *virtual classroom* allows instructors and learners to be in different places at the same time, and allows the instructor to save the event for later viewing. The topics covered can be similar to those dealt with in a live classroom unless they are too complex.

Advantages - Students and teacher don't have to be physically present in the classroom to benefit from the instruction. We can 'raise hands' by clicking a button. Information can be presented and desktops and computer applications can be shared across the Internet.

Disadvantages - Everyone must be online at the same time. In most cases, the participants need advanced workstations and a high-speed connection. Just like in a live classroom, informational sessions can place the learner in a passive role and learner attention may be lost

Blended learning provides flexibility in learning for both students and teachers. Integration of virtual and physical activities enables both instructors and students to become learners.

3.4. Pedagogical approaches in digital environment

During the academic year 2016/2017, I applied the blended learning method to all students I teach regardless of their form of education at the University of Veliko Tarnovo.

First type of blended learning – here we blend the traditional learning environment (for students from Bachelor programmes, full-time education and extramural studies, that study the subject 'Audio-visual and information technologies in the field of education) and an asynchronous learning environment (by using the options of the 'E-student' information system)

The study course and individual work tasks are published in the 'E-teacher' information system so that students can use whenever and wherever it is convenient for them. While in lectures we discuss, present projects as digital lessons on an interactive white board, audio and video didactic means which are elaborated by students as individual tasks or in groups with or without the help of a lecturer. The motivation of students is increased because each of them is able to present himself/herself, manifest his/her creativity, compare himself/herself with colleagues from the group in order to share his/her experience, get an evaluation and recommendation by colleagues, etc.
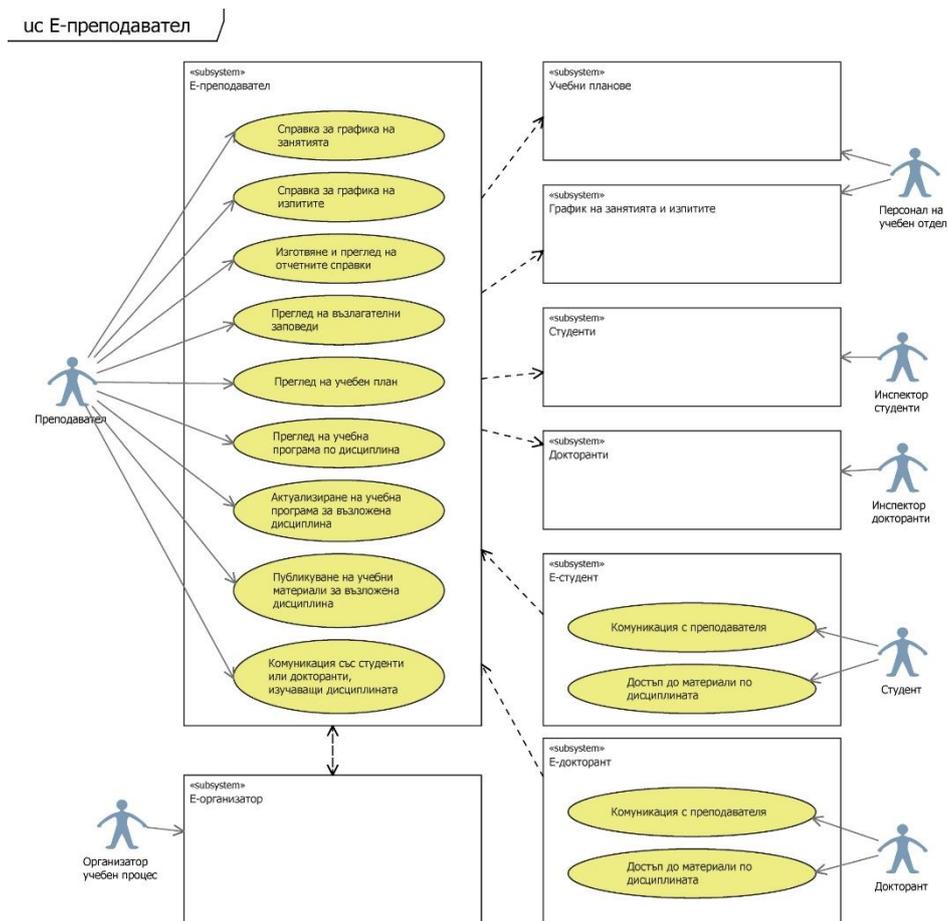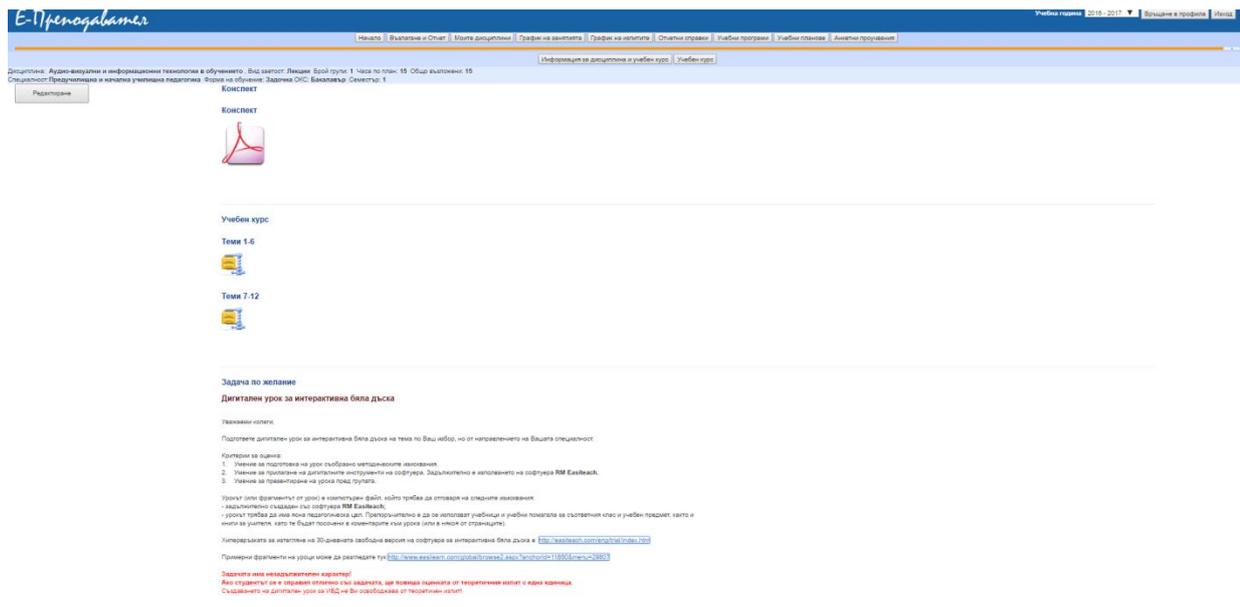
Fig. 6. UML use case diagram

The second type – here we blend synchronous and asynchronous electronic learning environment (for students from the Master's programme of the Faculty of Pedagogy: Information and communication technologies in the distance learning form of education). The subject is called 'Pedagogy of 21st century'. The realization of an asynchronous learning environment requires the use

of the internet-based distance learning platform which was specially created for the needs of Veliko Tarnovo University. Study resources are published in this system – synopsis, topics and individual work tasks. Students are able to work with this environment in a convenient time and place for them. The options of Microsoft Office 356 are used for the realization of a synchronous learning environment.

With the help of Skype for business purposes we managed to organize a **virtual classroom** in which we managed to realize an online communication in real time. Students presented projects created by themselves, they discussed and assessed themselves and other; they asked questions and searched for answers, etc. All of them were online at an exact hour and we were able to see and hear each other regardless of the distance between us. Students were particularly interested in this form of communication and said that it is completely satisfactory for working people like themselves.

The success of blended learning not only depends on the quality of education and the virtual environment, it also depends on the degree of lecturers' and students' willingness to work in a virtual learning environment.

That is why there is a great amount of research in this field, the results from which show that lecturers choose teaching methods and means spontaneously (Benson, Kolsaker, 2015, p. 324).

Here at the University of Veliko Tarnovo we make annual research about students' opinion of their education. At the end of the winter semester of the current academic year, 99 students with distance form of education from 5 faculties were inquired. The blended course is based on attendance and non-attendance periods; attendance periods are realized within the traditional learning environment while non-attendance periods are in an asynchronous learning environment.

A large amount of inquired students (93%) have a positive attitude towards the blended course (a combination of traditional face-to-face lectures and electronic asynchronous learning in a virtual environment). In open questions, distance learning students shared that they prefer distance communication (synchronous and asynchronous) due to their impossibility to travel and attend lectures and that they are completely satisfied with the opportunity to work jointly in an online community.

An inquiry research of full-time and extramural form of education students showed their desire and willingness to get the study content in the form of electronic resources; while attendance lectures should not be presented as traditional lectures where the student is the passive recipient of knowledge and is occupied with taking notes, but rather lectures should be filled with learning activities in which theoretic knowledge is put into practice.

4. Conclusion

On the base of own experience and the research that we analyzed, we could say that the application of blended forms of learning is an innovative teaching and training approach which guarantees independence on time and place; there is an opportunity to use different media, individualize the learning process, opportunity to use different styles of learning, organizing joint learning activities.

The successful application of this approach together with the organization of education and the quality of the virtual environment require the presence of the human factor which is really significant here – namely the presence of a lecturer who is able to combine different types of learning environments in order to provoke his/her students to perform various types of activities and develop their potential abilities and talents in the future.

5. REFERENCES

Benson V., Kolsaker A. (2015) Instructor Approaches to Blended Learning: A Tale of Two Business Schools/ The International Journal of Management Education 13 (2015) 316-325.

Benta D. et al. E-learning Platforms in Higher Education. Case Study. - Procedia Computer Science 31 (2014) 1170 – 1176.

Crişan A. and Enache R. Virtual Classrooms in Collaborative Projects and the Effectiveness of the Learning Process, - Procedia - Social and Behavioral Sciences 76 (2013) 226 – 232.

Güzer B. and Caner H. The past, present and future of blended learning: an in depth analysis of literature. - Procedia - Social and Behavioral Sciences 116, 2014, p. 4596 – 4603.

Kapenieks J. User-friendly e-learning environment for educational action research. - Procedia Computer Science 26 (2013), p. 121 – 142.

Kaur M. Blended learning - its challenges and future. - Procedia - Social and Behavioral Sciences 93, 2013, p. 612 – 617.

Knowlton D. S. A Theoretical Framework for the Online Classroom: A Defense and Delineation of a Student-Centered Pedagogy. – NEW DIRECTIONS FOR TEACHING AND LEARNING , no. 84, 2000 http://bcameron.oia.arizona.edu/OIRC/pdf/Theoretical%20Framework%20for%20Online%20classroomt.pdf

Köse U. A blended learning model supported with Web 2.0 technologies. - Procedia Social and Behavioral Sciences 2, 2010, p. 2794–2802.

Loureiro A. and Bettencourt T. The use of virtual environments as an extended classroom - a case study with adult learners in tertiary education. - Procedia Technology 13 (2014) 97 – 106.

McGill T.J. et al. Critical success factors for the continuation of e-learning initiatives. - Internet and Higher Education 22 (2014), p. 24–36.

Morgan T. Online Classroom or Community-in-the-Making? Instructor Conceptualizations and Teaching Presence in International Online Contexts. - International Journal of E-Learning & Distance Education, VOL. 25, No. 1, 2011, http://www.ijede.ca/index.php/jde/article/view/721/1269

Munthiu Maria-Cristiana et al. Characteristics of educational services in the virtual environment - Procedia - Social and Behavioral Sciences 109 (2014) 1237 – 1241.

Palloff, Rena M., Pratt K. (2007) Building online learning communities: effective strategies for the virtual classroom — 2nd ed., Jossey-Bass, 2007, p. 321, http://www.bh-mehregan.com/mobina/admin/Files/Books/Building%20Online%20Learning%20Communities.pdf

Pieri M. and Diamantini D. An E-learning Web 2.0 Experience. - Procedia - Social and Behavioral Sciences 116 (2014) p. 1217 – 1221,

Ravanelli F. and Serina I. Didactic and Pedagogical View of E-Learning Activities Free University of Bozen-Bolzano. - Procedia - Social and Behavioral Sciences 116, 2014 , p. 1774 – 1784.

Swenson, Patricia J. Taylor, Nancy A. (2012) Online Teaching in the Digital Age. - SAGE Publications, Inc, 2012, p. 105. eISBN: 9781452281001

Valsamidis S. et al. E-LearningActivityAnalysis. - Procedia Economics and Finance 9, 2014, p. 511 – 518.

Yang Z., Liu Q. Research and development of web-based virtual online classroom. - Computers & Education 48 (2007) 171–184.

Internet resources:

14 Technology Concepts Every Teacher should Know about (2013)-
http://www.educatorstechnology.com/2013/03/14-technology-concepts-every-teacher.html

The 21st Century Pedagogy Teachers should be Aware of (2011) -
http://www.educatorstechnology.com/2011/01/21st-century-pedagogy-teachers-should.html

21st Century Education vs. 20th Century Education (2009) –
http://www.youtube.com/watch?v=HiD1UqLPrOg&feature=player_embedded