# Requirements to teachers for using interactive whiteboards in creating training modules for ODL-process

Vanya Stoykova, Snejana Dineva, Krasimira Georgieva

*Abstract: A virtual learning environment has been created using Moodle software platform and has been applied in Technical College of Yambol. Multimedia courses have been created as well. In our paper we give the assessments of the requirements for the teachers regarding implementation of high quality open and distance learning process. Using interactive whiteboards and possibilities for the teachers to record their instruction and post the material on-line is a good opportunity for realizing ODL-process. The paper presents possibilities for using interactive whiteboards as an educational tool and their application into the practice. The experience and perspectives of their use in educational process at the Technical College of Yambol is shown.*
*Key words: ODL process, virtual learning environment, interactive whiteboards, requirements to teachers.*

## INTRODUCTION

The term open and distance learning (ODL) and its definition are relatively new in the field of education, having gained prominence only in the past 15 to 20 years. The language and terms used to describe distance learning activities can still be confusing, and geographical differences in usage - for example, between North America and Europe - can add to the confusion. Among the more commonly used terms related to open and distance learning are the following: correspondence education, home study, independent study, external studies, continuing education, distance teaching, self-instruction, adult education, technology-based or mediated education, learner-centred education, open learning, open access, flexible learning and distributed learning [6].

The development of the informational and communicational technologies in latest years and their introduction in the higher education in Bulgaria is shown in many documents – strategies, programs and decrees. The main purposes of the directions of education and learning in the national program of accelerated development of the e-society in Bulgaria, which was passed in 2008 and formulated in national strategic documents till 2013, are reaching the average European levels of the use of informational and communicational technologies, and modernization and optimization of informational and communicational infrastructure in high schools and universities.

Training in the modern information society is significantly different from the traditional, new forms and tools are used. On-line and ODL-process are particularly relevant now, which eliminated a large number of constraints (physical, financial, education and individual) to students [2]. One form of this type of training is interactive video training (including Web - conferencing) using interactive whiteboard as a part of the basic tools for its implementation.

## INTERACTIVE WHITEBOARDS (IWB) IN THE TRAINING PROCESS OF TECHNICAL COLLEGE OF YAMBOL

A scientific project „Investigation and Comparative Analysis of Interactive Means and Methods of Education in Technical Subjects" is developed in Technical College of Yambol. The project aim is investigation and comparing the results of the use of interactive methods and tools in the student education on different specialties at the college. Two interactive boards are bought in the term of the project realization. Some new IWBs are provided for application in the training process on different subjects. Lecturers from each specialty at the college are included in the project team, covering in this way most of the general technical and special subjects. Every lecturer from the team has aquired long educational experience and has developed multimedia courses, part of which are included in the e-learning system, introduced at the Technical College in 2004.

In the College activity, Moodle represents VLE design, which is well known in the academic community. The architecture of Moodle is compatible with the hardware and software available at the Technical College – Yambol. A blended educational model including multimedia materials and e-learning management system (LMS) is used for many disciplines (http://tk.uni-sz.bg/edutk/). As a result of different project achievements the foundations of a technical and informational data for future distant learning process took place: virtual library with didactic materials – lectures; exercises; multimedia sources; tests; glossaries; links to other web-base; on-line resources; etc. has been created (http://tk.uni-sz.bg/edutk/). This system includes over 40 subjects.

### IWB – POSSIBILITIES FOR IMPROVEMENT OF TEACHING

The interactive whiteboard is well known in West Europe and USA and it finds rising applications in high schools and universities in Bulgaria. The new method of teaching has many privileges, which help the students to improve their learning.

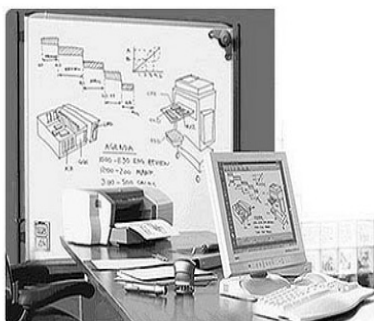Some of the main ways to use interactive whiteboards in the training process are mentioned in [8,1]:



**Fig.1. E-beam interactive whiteboard**

 Save lessons for later presentation to students who were absent;

 Create video files to teach a software application, a lesson, or a review to be posted to the server or web;

 Present presentations created by student or teacher;

 Digital storytelling;

 Teach whole group to computer or keyboarding skills;

 Brainstorming;

 Take notes directly into PowerPoint presentations; Desktop, videos and other applications

 Reinforce skills by using on-line interactive web sites;

 Teaching students how to navigate the Internet;

 Diagramming activities;

 Teaching steps of solving the problems.

There are many websites that starts to offer educational resources which work well on interactive whiteboards in the classroom. The resources are organised by subject, age group and category to make them easy for usage. The team constantly updated the web sites to ensure that they are up-to-date [7]. The visualization of the educational material gives a better possibility for perception of the educational content and more time for discussions. It is undoubted fact that the visual memory is much more powerful and allows easier and quicker learning of the material.

The IWBs distributors offer the boards with e-lesson sets for students from 5 to 15 classes in "Mathematics", "Physics", "Chemistry", "Biology", etc., and some subjects for 1-4 classes namely "The human and the nature". There are reports about the use of the boards in education on other subjects like "Domestic technique and economics", "Fine arts", IT, "Foreign languages", "Bulgarian language"', "Music", "Geography". IWBs are used in professional training at some professional high schools in Bulgaria.

A IWB has been already used for training the students at the Technical College of Yambol. Lectures and exercises of some courses in "Automatics, Informational and Managing Technique" degree course have been demonstrated. The IWB Wiimote, which is developed by Johnny Chung Lee, was used within the "CAD systems" course. The IWB

gave some faults, which prevented its further use. The problems could be summarized as follows: the slow speed of tracking and creating of the images and actions on the board; low resolution; low reliability; non-stop pressing the button during the operations; lack of right button and corresponding possibility for activation of concrete menu; special requirement for the light; etc. [4].

Nevertheless, the results of the use of IWB in education on specialty "Automatics, Informational and Managing Technique" have shown an increasing interest of students to the new innovative tool for presentation of the educational content. Some students presented their projects about the solution of the concrete problem with the use of the IWB.

### REQUIREMENTS TO THE TEACHERS FOR USING IWB IN CREATING ODL-MODULES

The most used brands of interactive whiteboards in Bulgaria are e-Beam, ONfinity CM2 MAX, Mimio, InterWrite, Clasus 9000B and an interactive board which is implemented on the base of the game console Nintendo Wii (Wiimote).

The following requirements to the teachers who are going to use IWB as a tool for teaching and creation of the ODL-modules could be specified.

Abilities to use the relevant hardware:  1. Skills for working with computer;  2. Skills for working with multimedia projector; 3. Skills for working with interactive whiteboard.

The first two abilities are already proficient for all the teachers and professors at the universities. For the last one the teacher shall take relevant training. The best approach is training for a particular board that has been purchased, taken into account the installation and using the hardware. There are peculiarities in the use of portable models Wiimote and ONfinity CM2 MAX that concern the location of receivers. The teacher must be familiar with the requirements of the position. It consumes time to configure the IWB them before class. It can be placed on stands respectively.

ONfinity CM2 MAX can be placed on the ceiling, but in this case their mobility is lost. When working with the portable models Wiimote and ONfinity CM2 MAX the teacher must comply with the position of the hands and body. The connection with the receiver could be lost. The CLASUS 9000B and InterWrite DualBoard models overcome this problem. There are no receivers. They are built on electromagnetic principle. But they lack mobility, except in the version "board on wheels." In e-Beam and Mimio the receivers are placed on the board. They can be completely fixed (USB cable and receiver) or partial (only the cables are installed, the receiver worn by the teacher) – that ensure better mobility in the second case; there is no need to buy boards for each room. These boards also have cordless models, i.e. a wireless connection with the computer, which is much more convenient option for the teacher.

Ability to use a stylus. Most stylus models have two buttons and some of them have additional buttons for management of palette of tools or scrolling. ONfinity CM2 MAX has extendable stylus pointer which creates handiness in pointing and obviates the problem with the teacher's shadow. Some models have additional rubber for erasing and colour electron markers. Representing cylinders, in which can put an ordinary colour markers. When the marker is placed in the device it turns on a transmitter, which gives a signal to the receiver. The created image can be "captured" by the software to the board and saved in appropriate file format. The teacher must have the ability to work with them.

Ability to use the necessary software :  1. Ability to work with the used operating system and application software: OS Windows or other. Actually, IWB's can work with all the available operation systems. The teacher must also have basic skills to work with mouse and keyboard, to copy or move objects (drag & drop), to use windows and menus and more. Using MS Office or other package applications, necessary for educational or vocational training (e.g. CAD systems), Adobe Reader, Internet browser, etc..

2. Installation and setup the software driving the board. It is performed once on a single computer, which is going to be connected to the board. This can be implemented by the teacher, if he/she has the appropriate training. It is desirable to install the same software on more computers, where the materials/lessons (presentations) are going to be prepared. If Bluetooth is used for connecting to the computer, Bluetooth drivers should be installed in case they are missing. During the installation of the IWB's software it is possible to occur some problems concerning the compatibility with other computer applications installed.

3. Calibration. After installation of hardware and software, it is required to calibrate the board. Each board must be calibrated before use in order to determine the amount of "place" to identify actions with the "pen". The calibration is necessary to be done every time when the interactive board is started. It is performed on all boards. If calibration fails the position of the receiver must be corrected.

4. Ability to use basic modes of operation of the software. Regime "Design Material" – application notes, annotations, additions on the image (Projection), which can be stored. Stylus functions of the mouse on the board/projection screen. Regime "Ordinary whiteboard" (Whiteboard) – electronic colour markers are used and created as their image is "captured" by the respective software. The second mode can be implemented by stylus (Fig. 2).
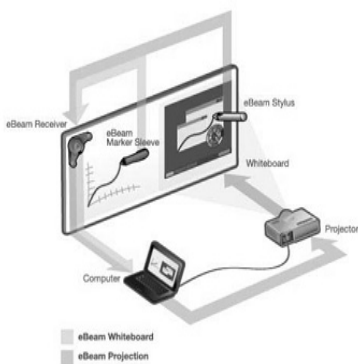


**Fig. 2 Regimes of operation: e-Beam Whiteboard, e-Beam Projection**

5. Ability to work with interactive devices – using software for preparing presentation or the software modules of IWBs for creating interactive lessons (presentations). For example, in IWB e-Beam [5] there are two ways to prepare an interactive lesson. The lesson is developed as a series of fragments. Under a "fragment of a lesson" we should understand a sequence of frames/pages, which will be presented to students during the lecture. The fragments are prepared in advance by the teacher and are saved as files. For their creation can be used two programs and therefore they have different file extensions: *. esb - if used "Scrapbook" or *. wbd – when working with "Capture". There are small differences between them. If working with "Scrapbook", frames/pages can be viewed as sequence of layers - transparencies, on which various images are displayed. If used "Scrapbook", as elements can be added segments with one and two-way arrows, rectangles, circles. A big advantage of the proposed software is the ability of teachers to work on staff during their projection. These actions can be added to the pre-prepared content and newly shared file to be a good educational experience. If "Capture" module is used to "capture" the image of the board, sound-track can be added and recorded as video file (*. avi ). Audio-video files used for training purposes are created by the program modules "hold of" of the image of the board (Capture), which is part of the software of all the boards. This form would find mainly use in ODL-process for the creation of video lectures given to students enrolled in a digital information medium (CD, DVD), sent by e-mail, publish in e-learning systems or presented as on-line lectures during the Web conference [3]. Creating a presentation using the specific IWB software leads to

some inconveniences, since the lessons developed on a specific board generally could not be used on other models. This causes problems in the distribution of teaching materials and organization of training. There are IWBs models that use the same software (e.g. Wiimote and InterWrite) or offer recording in various file formats that can be used by other boards (.pdf).

6. Ability to use a gallery of ready images. All the boards have such libraries, containing maps, geometrical figures, diagrams, photos and other visual aids used in teaching on different disciplines.

7. Ability to use a set of interactive tools. IWBs have a set of geometrical instruments, line, triangle, protractor, compasses, which can be plotted, emphasizes, painted with different colours and thick lines, arrows, rubber, magnifying glass, wallpaper (for the closure of part of the screen) , illumination, onscreen keyboard, etc.. Interactive tools are arranged in a submenu, bands, theme (round), which has even special button on the stylus control models (e-Beam). Smart bands/themes tool - change the set of instruments according to mode (started software module on the board).

8. Ability to use the interactive buttons on the board. Using to start the most frequently used applications and tools (for some models Clasus, InterWrite, ActivBoard).

**CONCLUSION**

The interactive whiteboard offers better visualization of the educational process as well as creating interactive ODL-modules. The IWB is already used for training the students during lectures and exercises on some courses in "'Automatics, Informational and Managing Technique" specialty. The interactive board Wiimote is used for training students how to work with MS Excel and other software products within "Programming and use of computers" course, and for teaching C++ within "Programming languages and systems in automatics" course. For this purpose an investigation of possibilities of e-Beam server is provided in the practical exercises on the course "Computer Networks and Systems".

It is considered the use of the board in other courses of "Automatics, Informational and Managing Technique" specialty, for example "Microprocessor technique" – for learning the modules of a concrete processor and writing, simulation and testing of programs, and "Analysis and synthesis of logical schemes" using simulators for analysis and synthesis of logical schemes, etc.

The IWB is used in the course "The Road safety" in the specialty "Auto transport and agriculture technique" for making remarks and notes on the screen, for projecting of educational movies, which present real traffic situations. Lectures and exercises with the use of IWB are prepared for the main design and constructional subjects of the specialty "Design, technologies and Management of Fashion Industry".

In the Technical College of Yambol creating of ODL-modules for the courses on "Chemistry" and "Microbiology" in "Food technology" specialty is also considered. The IWB will be used for general technical subjects like "Technical drawing" and "Machine elements". The experiences of using IWBs in Technical College - Yambol give us reason to continue with introductions of interactive boards in the educational process.

**REFERENCES**

[1] Константинова, М. Интерактивна дъска. //Училищен мениджмънт, изд. Просвета, 2010, № 2.

[2] Тотков, Г. и колектив. Е-обучението в информационното общество. Технологии, модели, системи, достъпност и качество. Пл. Университетско изд. „Паисий Хилендарски", 2010.

[3] Христов, Б. еBeam без хардуер. http://teacher.bg/cs/blogs/hristov_b/ archive/2011/03/11/ebeam.aspx , 2011

[4] Stoykova V. Application of Interactive Means in Students Education in Technical Specialties, E-Learning and the Knowledge Society, Bucharest, Romania, August, 2011, in press.

[5] http://www.cct.bg/images/programs_u/41_F_IWB-LUIDIA.pdf

[6] http://www.col.org/resources/publications/trainingresources/Pages/intro.aspx

[7] http://www.topmarks.co.uk/interactive.aspx

[8] http://rmtc.fsdb.k12.fl.us/tutorials/whiteboards.html

**Contacts:**

Principal assistant Vanya Stoykova, Technical College of Yambol, Trakia University-Stara Zagora, Bulgaria, Phone: (+359 46) 669181, e-mail: vdstoykova@gmail.com

Assoc. Prof. Snejana Dineva, Technical College of Yambol, Trakia University-Stara Zagora, Bulgaria, Phone: (+359 46) 669181, e-mail: sbdineva@abv.bg

Assoc. Prof. Krasimira Georgieva, Technical College of Yambol, Trakia University-Stara Zagora, Bulgaria, Phone: (+359 46) 669181, e-mail: kr.g.georgieva@gmail.com

**The paper has been reviewed.**