Components of the Virtual Internet Classroom model for distance learning of information content

ŽELIKO MARČIĆEVIĆ, RADOVAN TOMIĆ, DRAGICA TOMIĆ
Higher School of Professional Business Studies
Vladimira Perića - Valtera 4, 21000 Novi Sad
SERBIA
vpskola@uns.ac.rs  http://www.vps.ns.ac.rs

Abstract: The paper will show some of the modular units of the Virtual Internet classroom system for interactive learning of information content in an open learning environment in a shared space of the Internet. Furthermore, the abilities to automatically update data in the e-Guestbook within the Web based environment and e-information board will be displayed. A component for multifunctional relationship with a real teacher - Mailing list, will be displayed as well as a module for testing students' knowledge. Virtual Hypermedia Classroom is implemented using ASP development technologies with the user interface toward distributed databases.

Key-Words: Distance learning, model, component of a model, a Virtual Internet classroom, ASP technologies, distributed databases.

1 Introduction
In the last ten years teaching materials, teaching methods and approaches have been developed and improved in order to increase the efficiency of the teaching process [1]. Process of modernization of existing technologies is taking place much faster in production areas, and it is rightfully expected that colleges and universities follow the innovative processes and educate young professionals to meet the needs of society and the economy [5].

In an effort to determine the premises and forms of modern educational system, we are facing a very complex task. It is not enough to know past experiences it is necessary to look into the future, taking into account new phenomena and tendencies inherent in time in which we live and the time ahead of us [6].

To increase and improve the efficiency of our educational and learning process and the entire educational system new educational models with the new educational technology must be implemented [8]. Hence, we need to constantly monitor and analyze the latest developments in the field of modern information and communication educational technologies. We should consider the use of modern educational technology from the standpoint of other sciences such as psychology, pedagogy, philosophy, sociology within the different systems of education and training [2]. In the current state of the educational system it is necessary to put in practice the new information technologies with the use of the entire infrastructure of the Internet because it would lead to the increased efficiency and quality of teaching and learning process [9].

The traditional educational system must be modernized, transformed and improved. Any negative consequences must be considered in case of eventual inappropriate use of the latest sophisticated telecommunications information systems [3].

2 Problems in the traditional teaching
The role of teacher in the traditional teaching is mainly confined to lectures and occasional check of students' knowledge, although it should be permanent and much richer and varied. The teacher should refer students how they should learn so that they can became independent, to advise and assist them to make faster progress [2]. There is little communication from student to teacher and there is almost no horizontal communication in which students share information with each other.

Because of the one way flow of information, from a teacher to a student, feedback is very rare. The teacher does not have information on the amount of material adopted by the student. Neither students, since they do not send feedback information to the teacher about the level of adopted content, they are not aware if they know and whether what they know is well enough [4].
Since the feedback is missing in most cases, evaluation of students is reduced to occasional tests which are not reliable basis for assessing student knowledge and progress, for assessing the validity of the teacher's work and for eliminating weaknesses in the teaching process. This state of education in today's schools has multiple causes and here are the three most important [9]:

1. too extensive and undifferentiated programs
2. insufficient didactic - methodological preparation of teachers
3. poor material and technical basis of teaching

3 Learning in a Virtual Classroom

Distance education is learning while students are at a distance from professors, students are separated from their professors in time and space, but they still direct and lead them through education. Distance learning can be defined as a system of teaching and learning where remote teaching centers where can allow access to the main classes, seminars and meetings [16].

Distance learning conquers space and time. The student can see his teacher, communicate with other students from distant geographic areas [16].

Interactive multimedia Internet classrooms with appropriate equipment provide new opportunities for the improvement of educational work through distance learning [13]. The most important feature of this teaching is to enable visual and acoustic encounter for teachers and students who may be in very remote places. Teacher presents the material, demonstrates sketches, patterns, graphs, pictures, slides, films, and students see and hear all that. If they do not understand something, they can ask. A two-way, synchronous, audio - visual communication is achieved between remote teachers and students. Pictures, voices, ideas, knowledge travel instead of people [13].

Students and teachers who are on the Internet in the Virtual Hypermedia Classroom have access to teaching materials from which they can draw intellectual substance. Users are allowed to make use of moving images, sound, text, illustrations and animations for mastering certain content [7].

The effectiveness of the teaching process is measured by time and energy spent by teachers and students for mastering the relevant course content. Effective teaching is one which allows the acquisition of maximal reliable and permanent knowledge with minimal possible expenditure of time and energy [2]. Such efficiency should, with the skillful use, be achieved achieve in the Virtual Hypermedia Internet Classroom [7].

The position of students is significantly changed. The student cannot always be passive. Tasks set by the program can be more or less difficult and can "force" students to be mentally active, to take turns from the position of an object into the subjective position and vice versa. The student will be able to communicate more interactively with other forum participants [5].

The position of a teacher, who is no longer the only and main source of information, is also fundamentally changed. He becomes an organizer, adviser and facilitator. He is supportive and has educational impact [14].

Tele-teaching requires dynamic, active and direct teaching concepts. In open, global, virtual spaces, the teacher, i.e. lecturer must, or should, pass his main role over to the students. In this system, the teacher should be a guide and facilitator through the learning process and serves as the navigator through newly discovered information [15].

4 The logical structure of the Virtual Internet Classroom

Virtual Internet Classroom in cyber space environment provides the conditions for the distance education of information content and intellectual essence by using the telecommunications infrastructure of the Internet. Implemented and designed model is in the function of the realization of the curriculum and teaching content from the domain of information technologies at any time (full time) at any location (shared space).

![Figure 1. Logical structure of scalable modules in the of Virtual Internet Classroom system.](image-url)
The model is intended for [15]:

- On-line synchronous communication adjusted in real time with two-way interactive technology, where students and a real teacher - instructor are present (discussion forum, chat, e-mail, conference system and other components).
- On-line synchronous communication adjusted in real time with one-way interactive technology where students are present a real teacher is absent from the communication line and a site (adaptive virtual professor, intelligent database of concepts, intelligent examining and others components).
- On-line asynchronous communication with a time delay, e-students are present a real teacher is not present (e-mail and other components).

Virtual classroom is implemented as an ASP.NET application on NET 3. Data is stored in SQL Server 2008 database [10]. User interaction is done through web forms and web browser.

Virtual Classroom is available through the Web, and several levels of access are defined: [11]

- The first level contains the publicly available data page, and all users can access them without identification, that is, initialization.
- The second level, which includes data entry forms, is available only to authorized users (i.e. users with a user account).
- The third level is for administrators and allows access to all data for registration, and allows the user management [10].

Therefore Virtual Internet Classrooms software must be run with:
HTTP://LocalHost/rad/default.htm.
Access to work environment of the interactive lessons is achieved by entering the command within the structure [9].

6 Virtual Internet classroom modules

Communication is a two way process: [4] where we give information to our tele-students, and if Web sites i.e., virtual system, satisfies their needs, they provide information to a virtual system. Revisits from the same tele-students can be provided if the information of a virtual system are always current and easy to find. Information from tele-students may be required by using a simple mechanism for providing feedback.

Some of the dynamic components that cover this segment are [7]:

- **Guest Book for e-learners** with opinions of the Virtual Classroom. Guestbook has a form to send and a confirmation form - via feedback forms and through a database, but it also contains the download section for the curriculum.
- **Mailing lists** for the contact with a real professor, using form technology (query form) with the function of collecting data and supporting database.
- **Knowledge test** with the possibility of interactive giving and checking correct answers, using Java applets technology.

6.1 On-line Guestbook for e-learners

Guestbook is on-line synchronous form with the function for collecting data on students’ opinions about Virtual Internet Classroom.

Supplying students with information is an important moment on the website. By using the Enter your opinion – form, students who have logged in the system send data directly to the database on the Virtual Internet Classroom server [11].

For this purpose a form has been created - a data entry form - the opinion of students on a Virtual Classroom [17]. It has the function of accepting data from the e-student and sending data to the database. The value of information we receive from students in large part depends on how the request was presented. Students fill out surveys and provide data that can be seen before they are inserted into the database of Virtual Internet Classroom by means of the confirmation side - the site.

![Figure 5. Students' opinion on the Virtual Classroom.](image)

In order to induce them to take time and update information, we have to attract students' attention in the best possible way. They will be more inclined to help us to collect information if they are also interested in the job they do (studying) and if their Virtual Internet Classroom offers them some useful information from the field of study [18].

The information is returned from the database in an ordered state by a feedback form (Feedback Form) or a report from a database (Report Form) which is called Impressions of students. Some of the students’ impressions (filtered data from the database) are given on the site in the table below:

![Figure 6. The report from the database.](image)

6.2 Mailing list component

Students will come on the website from a variety of reasons, but it is most common that they come because they are looking for some new information. Virtual Internet Classroom displays all relevant
Through a main link from the main: Messages students can come to the Mailing List – multifunctional relationship with a real professor. This two-way information board belongs to the subject professor who uses it to collect information related to information technologies. Through information board professor receives messages of students. Students should occasionally look at the contents of the information board [8].

Students can use the specially generated links toward a real professor. These are [12]:

- discussion forum - dedicated e-forms for on-line synchronous communication
- web conferencing and
- e-mail for on-line asynchronous communication

Consultative e-learning with students is present in the module for multifunctional relationship with the real teacher. E-teaching and e-learning based on lectures are also present by using multimedia lessons in the Virtual Hypermedia Internet classroom.

Link - hypertext: Contact Professor (real, not virtual) draws students into a new working environment. This is a Request form (data collection), and messages that are sent to the professor - the instructor. Tele-students can send a message or question, to the subject professor. The comment above the form for entering text on a dynamic Web page is: "Send your message or question to the subject professor. Soon you will receive your response by e-mail."

The answer will soon arrive via e-mail to e-mail address of the student, with an accompanying comment, "Hello, Virtual Internet Classroom®.

6.3. Interactive Knowledge test module for assessing knowledge
While practicing, tele-student is given the opportunity to define the correct answer based on five given answers per question. Wrong answer brings 0 points, the minimum score is 0. Each task is
worth 20 points. The maximum score is 100.

By interactive checking (confirming specific responses) tele-student can have an insight if the answer is correct or not. Option Click here is designed if you want to check the solution. If a student marks the correct answer after activating the option for checking the solution graphic True occurs and vice versa.

![Image of Interactive Knowledge Test](image-url)

Figure 10. Interactive Knowledge Test.

The student has the opportunity to check if he has answered correctly after each question or after all questions are being answered. Answers to questions serve to point out to possible errors and their origin. When the student answers the question, he or she can compare it with the exact answer, which is located in the computer server program of Virtual Internet Classroom. So they get feedback on their knowledge. There are plenty of programs (such as drills) in which, there is no given answer to the posed question, but the tele-student is informed with a "yes" or "no" whether his answer is correct. This teaching form (question - answer - feedback) is appropriate if the instructor wants to help students gather information and factual material.

7 Conclusion

Using interactive Virtual Hypermedia Internet Classroom, major weakness of traditional teaching can be overcome to ensure equal access and equal demands of all participants in the learning process even though their knowledge, interests, mental potential, and other features are various. In the Internet Classroom teaching activities can be successfully differentiated, set at different levels of complexity and so aligned with the opportunities and needs of students [9].

The introduction of interactive Virtual Hypermedia Internet classrooms in the educational system supported by the most modern sophisticated educational telecommunication information systems can create a nucleus for further expansion of modern teaching technology, that is, to raise teaching practices to a higher level. This way, our educational system will begin to train itself for efficient acceptance of scientific and technological development [8].

References:

[18] PHARE Pilot Project for Multi-Country Cooperation in Distance Education 2008.