2.10. A CASE STUDY: A VIRTUAL CLASSROOM MODEL

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With their Distance Education Centers, universities are working on spreading their education services to wider recipients. Distance education has gained new dimensions with the principle of making educational activities available to everyone, everywhere at any time, by using the information and communication technologies in particular. Thanks to online education and teaching, virtual classes that enable education regardless of time and place, have made the use of many variables possible which could not be used or had limited use in traditional classes. In virtual classes, education can be provided synchronous or asynchronous. By using various communication tools, student-to-student interaction, student-to-teacher interaction as well as interaction within groups can be enabled at any time of the day.

The value of distance learning, which has been presented as an alternative to traditional teaching methods, has increased significantly with the development of information technologies. The fast spreading of the internet has made it available for use as a base for distance education. It enables verbal, audio and video communication and interaction, as well as making the information reachable.

The internet can also help to provide a more efficient and productive teaching-learning environment. The educational use of internet has
developed various terms such as Internet Supported Education, Internet Based Education, Web Based Education, and On-line Education, all of which serve the same purpose. While explaining the contribution of life cones and learning lives into the behavior changing period, Dale mentions the importance of the phenomena such as the number of the senses used in the process, the active experimental learning skills of the person and the basic or complex programmed learning style (Cilenti 1988). On the other hand, the internet helps individuals use multi-media applications with variables such as text, graphics, sound, animation, video clips etc. This enables them to enroll in individual or group teaching activities with applications such as e-mail, FTP, discussion groups, white boards and forums (Demirel, Seferoglu, and Yagci 2003). Today these structures on the internet are used heavily at universities as well as other educational institutions, particularly in distance-education centers. The biggest difference between classical education and internet based education is the teaching method (Varol and Varol 1999). Due to its ability to provide fast and interactive learning as well as more consulting services and discussion opportunities, education through the internet has provided a student-centered and democratic education environment that is based on individual teaching (Keser, Demirkalfa, Gocmenler, and Sen 2001). In Turkey, many universities such as Anadolu, Bilgi, Firat, ITU, Mersin, ODTU and Sakarya use various applications toward online education. It is important to target high standards in order to create a valuable distance education in Turkey similar to developed countries. It is important to present the class notes in an html format, however the main program requires more (Aslanturk 1999). Every element of the program development approach must be formed by a team of experts by paying attention to the characteristics of online education from need analysis to evaluation.
Virtual Class And Lesson Management System Software

The automation that provides an efficient and productive system to apply online education is described as Virtual Class or Learning Management Systems (LMS). The design of this type of systems is done with the principles of “Instructional Design”. Instructional Design (ID) can be defined as organized procedures that plan the special teaching activities and determine the objectives, content and applications for teaching (Ipek 2002, 2003). During teaching design, the general steps to take into consideration are analysis, design, development, testing, publishing, evaluation and correction (Gustafson and Branch 1997). Today, besides TV-based education, distance education is published by internet supported web sites and Distance Education Platforms specially prepared for this purpose. The necessary features of these platforms include easy registration of students and classes into a database, suitability of presenting any kind of electronic education material, a reporting feature that enables submission, testing and evaluation which enables follow-up of student improvement levels and answering the needs of the students.

There are many virtual classes and Management System Software produced by technology firms or universities. As a solution for distance education, software such as Lotus Learning Space, WinClass or WebCT which are made by big companies like IBM and Microsoft are being used. Since these programs are prepared for international institutions, they can not meet the requirements of our education system. Nevertheless, while using these software, METU Information Institute, which is a leading institute in distance education, has begun to apply its own new software NET-CLASS under the name of IDE_A (Internet Supported Education-Synchronization Project). Since the software did not meet their requirements ODTU (METU) has been the first Turkish University to sign a commercial protocol along
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with a private company in producing this type of program (ODTU 2005). Also, Sakarya University, in cooperation with IBM, provides software services to universities that have distance education. Sakarya University recognized the modifiability of the Lotus LearningSpace program of IBM to fit their requirements and started distance education work in July 2000. Within the frameworks of that project, Internet Supported Teaching Groups have been established in both universities whose members are from Computer, Industrial, Mechanical Engineering and Mathematics areas. The studies are conducted by the cooperation of the technical committee of academicians at the university and committee of the partner company. Training was provided for the academicians who work in this group. Some of the programs that possess virtual class or Windows based lesson preparation and presentation qualities are given below along with their URL addresses:

Table 1. Lesson Management Systems / Virtual Class Software (Aslanturk 1999)

<table>
<thead>
<tr>
<th>LMS Name</th>
<th>Web Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROQUEST</td>
<td><a href="http://www.umi.com/proquest">http://www.umi.com/proquest</a></td>
</tr>
<tr>
<td>Copyright Clearance Center, Inc.(CCC)</td>
<td><a href="http://www.copyright.com/About/default.html">http://www.copyright.com/About/default.html</a></td>
</tr>
<tr>
<td>Learning Space</td>
<td><a href="http://www.lotus.com/learningspace">http://www.lotus.com/learningspace</a></td>
</tr>
<tr>
<td>TopClass (WBT Systems)</td>
<td><a href="http://www.wbtsystems.com/index.html">http://www.wbtsystems.com/index.html</a></td>
</tr>
<tr>
<td>Web Course in a Box (WCB)</td>
<td><a href="http://www.madduck.com/wcbinfo/wcb.html">http://www.madduck.com/wcbinfo/wcb.html</a></td>
</tr>
<tr>
<td>WebCT</td>
<td><a href="http://www.webct.com">http://www.webct.com</a></td>
</tr>
<tr>
<td>Web Mentor</td>
<td><a href="http://avilar.adasoft.com/avilar/msubwm.htm">http://avilar.adasoft.com/avilar/msubwm.htm</a></td>
</tr>
<tr>
<td>FIRSTCLASS</td>
<td><a href="http://www.education.softarc.com">http://www.education.softarc.com</a></td>
</tr>
<tr>
<td>Collaborative Classroom</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Software Name</th>
<th>Website URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mentorware Enterprise</td>
<td><a href="http://www.mentorware.com">http://www.mentorware.com</a></td>
</tr>
<tr>
<td>Education Server</td>
<td></td>
</tr>
<tr>
<td>CONVENE</td>
<td><a href="http://www.convene.com">http://www.convene.com</a></td>
</tr>
<tr>
<td>BlackBoard</td>
<td><a href="http://www.blackboard.com/">http://www.blackboard.com/</a></td>
</tr>
<tr>
<td>Click2Learn</td>
<td><a href="http://www.click2learn.com/">http://www.click2learn.com/</a></td>
</tr>
<tr>
<td>Docent</td>
<td><a href="http://www.docent.com/">http://www.docent.com/</a></td>
</tr>
<tr>
<td>IntraLearn</td>
<td><a href="http://www.intralearn.com/">http://www.intralearn.com/</a></td>
</tr>
<tr>
<td>Moodle</td>
<td><a href="http://moodle.org">http://moodle.org</a></td>
</tr>
<tr>
<td>eduGate</td>
<td><a href="http://www.thembaclup.com">http://www.thembaclup.com</a></td>
</tr>
<tr>
<td>Saba Software Inc.</td>
<td><a href="http://www.saba.com">http://www.saba.com</a></td>
</tr>
<tr>
<td>SystemSoft</td>
<td><a href="http://www.systemsoft.com">http://www.systemsoft.com</a></td>
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</tbody>
</table>

In order to provide a different approach to online education applications and suggest alternative solutions to the software handicaps, a Virtual Class Automation has been established to be used in Firat University Distance Education Center (FU-UZEM). In this automation, an ergonomic platform was targeted that is easy-to-use by both students and educators. With the standard knowledge of computers and internet applications, the educator can produce his or her class in an internet environment in a logical step by step manner. The instructor can make various variables such as project, class syllabus, and text book sources available to his/her students and can receive feedback from the students.

**FU-UZEM Software of Virtual Class Education Center**

In accomplishment of distance education, the automation of the composed distance education interface has a significant role. Ergonomics and safety and design methods are very important in determining the lectures given and the classes, arranging the contents of lectures and the authorization, holding examinations and defining the test techniques of the
exam questions in all the states of distance education.

According to the design principles of Intercollegiate Communication and Information Technology Higher Education standing orders, the major characteristics of software are:

1. It provides the professor the ability to set up options, to create his/her page step by step and to open lectures to his/her name just with the knowledge of basic computer usage.

2. It gives the option (to students and the professors) of making corrections in their page or adding information with their passwords whenever they want.

3. All the information about the students is recorded to the student list showing the date and hour they attend the class so that students can follow the lectures.

4. In a package which is formed about the lecture, there is a detailed communication page. In this page there is a virtual café (as a chat room), e-mail lists, argument groups and message boards. By this way, offline and online communication is performed.

5. There’s an exam schedule to achieve midterms, finals, make-up examinations and tests. The participants can take the exams in one center or by going to other defined regions. The exams can be achieved synchronously or asynchronously by the centers which the participants are present at.

6. There is a system director to solve all the problems. Except the help menus which explain the usage of the program, there are connections to send messages to system director on shared pages (Turel 2003).

Software Technology
In web pages, the HTML language is enough for one sided (static) data edition. But if processing of the data is purposed by getting information from user, database or another application, different software languages such as ASP, PHP, JSP, Pearl, CGI or ASP.NET are needed. For execution software, these languages are compared and PHP language is preferred (Ullman 2001; Microsoft Pres 1988; Holzschlag 2004).

1. PHP is a C-based language. It is very simple and its command library is very rich.

2. It runs across with no problem in most platforms such as Windows, UNIX, OS/2 and Macintosh.

3. It works seamlessly with nearly all databases.

4. It is distributed freely because it is open source coded. Thereby its development is faster and it becomes easy to eliminate the errors.

5. PHP works faster when it is compared to other languages. When it works with a MySQL database, it works 10 times faster than its rival ASP.

6. It gives the opportunity to work with different web servers. For example, it works easily with Apache, PWS, Xitami. The Apache web server configuration is the most common.

After the selection of the language, it is required to define the web server on which the automation works. One of the Unix-Apache, Windows-IIS (PWS) or Windows-Apache pairs can be easily used with PHP. The created software is adaptable to both Apache and IIS (Internet Information Service).

The database has to keep in order all the data in the system, also it has to have in stock all the commands needed. MySQL can respond to all these expectancies. It is very easy to use and it has a very high performance
when it works with PHP (phpturkiye 2005; turk-php 2005)

Beside the fundamental elements of software, different programs are used to make the usage of some codes, designs and processes easier and faster. As an editor, applications like Microsoft FrontPage, Macromedia and Dreamweaver MX are used to provide the visual sides of web pages in HTML format, also PHPEd is used to write the codes of PHP language. In all the processes about data records, software PhpMyAdmin is used, because it is very fast and gives the opportunity to interface the database directly. The animations are created by Macromedia Flash MX and the writing effects are created by Swish 2.0. To increase the efficiency of visual materials and to provide the optimization of photos and images, Adobe Photoshop Software is used.

**The Design of Virtual Class Automation**

In designed automation systems in general, it is aimed that the professor can open the lectures according to his workspace, enrich them with the materials he has and use the internet components. The students also can be registered for the lessons in the system and select one of the opened lectures in virtual campus and attend these lectures. It is necessary to create the most efficient but simplest platform for the professors and the students to use the system without any problem. Also it is considered that the technique characteristics of the computers of the professors and the students can be under the standards so that an automation can be setup which works easily in low speed connections and low configurations.

The design of the system is proposed in 4 basic modules so that every part can develop independently. These are management module, lecture presentation module, communication module and exam module.

**Management Module**
Most of the elements such as announcements, notices, schedules, explanations, guidance, aid and lecture materials are added to the system with the help of this module. Shared lectures, classes and the security procedures are actualized by the director’s approval. Users can reach the information as their terms of reference. Also the changing, updating or deleting of the information can be made by director or professor.

**Lesson Presentation Module**

By means of this module, the raw knowledge and materials produced by the experts of that area and teachers are transferred to the virtual environment by the web designer team/individuals according to pedagogic formations.

**Communication Module**

All the communications in the class are provided by means of this module. To keep active the relations between the tutor and student or student and student in or out of the lecture, there are e-mails, e-mail lists, argument groups and forums, chat rooms and class notebooks (Varol and Turel 2003).

**Exam Module**

A developed system which provides taking exams on web pages works integrated with the designed automation. The professor has the chance to save questions about his lectures in a database. These questions can be divided according to their subjects and grade distribution. The system selects recorded questions according to subject distribution randomly and holds examinations. Exams are executed in defined centers for security. When the students signs up, they can see their grades and which exams they have to take (Varol and Karabatak 2002).

**Examples of Application**
There are 4 types of users in automation: administrator, professor, student and the guest. According to the user type, at registration, all the data is recorded to the system by using the connections of ‘student registration’ and ‘professor registration’ where user name and password are defined.

Figure 1. Home Page of Virtual Classroom

After the data is entered into the 'name and password entry area' as in Fig.1, the user is known automatically and directed toward the requested page. Cookies can solve the problems caused by unauthorized entries and the security problems which are caused by the system timing out. If nothing is entered for a period of time, the user has to enter his name and password again. As shown in Fig.2 and Fig.3, the page opens according to the user type entered.
If the professor wants to open a course about his field of knowledge, he has to fill in the 'Course Demand Form'. The course is opened if the unit which examines the course demand form, finds it acceptable. This allows
the 'Open Course' link to become active (Fig.4).

Figure 4. Course Application Menu

The 'open course' link provides entry to the section which allows the professor to set up the course step by step. In this section, the course opening form which includes the general information about the lessons, source adding pages, and the materials about the lessons (as a file) are saved respectively. The pages such as lesson content adder (Fig.5), the announcement adder and useful links are completely customizable to the tutor. In these pages, generally a standard settlement is preferred for simplicity. Adding of data on the upper side, in the middle and on the lower side is possible. The ability to delete data according to the entered number of registrations is provided. Professor can edit this not only before the course but also after the course begins. The students can also see the lists on these pages, but don't have the ability to delete data.
Figure 5. Course Content Menu

After the professors' requests, administrator adds all the courses to the system by the help of the form shown in Fig.6. It is necessary to fill in the registration form for all users.

*ADDING COURSE*

![Course Content Menu](image1)

![Adding Course Form](image2)

Figure 6. Adding Course
After this procedure is done and all the data about the course is entered by the teacher, the student or teacher selects the correct course box. Then a web page opens. In Fig.7, a student course page is shown as an example. Here, the students can view the data entered, but the teacher has the opportunity to edit, delete or add registrations. Students can reach the data for the resources, lesson contents, announcements and connections by using the buttons on this page.

During or after the registration, the data, directly entered or automatically generated, is saved in a table. The database defined as FIRATWEB includes the tables which are shown in Fig.8.

Figure 7. Links Page
Conclusions

It is possible to make huge reforms in education due in part to new developments in technology. Online education has the capacity to overcome many problems of the general system such as inequality of opportunities, time and location limitations, not meeting the needs of the individuals, communication restrictions and not being able to offer special teaching styles to fit the learning speed and style of the individuals. By means of the internet, audio and video communication can be established. Elements such as sound, text, animation and graphics can be used to make learning a more efficient and enjoyable process. The active participation of the individual can be achieved by e-mail, forum or chat rooms. As a result, it may be possible to educate the people more freely and give them more self-confidence to allow them to express themselves openly.
One of the required elements of online education is a safe, easy-to-use and effective automation that enables the application of the system. The purpose of this study is to answer the online education software needs in Turkey by the developed virtual class automation and therefore contribute to the studies in this field. The software consists of four sections; management, lesson presentation, communication and examination. These sections can be developed independent of each other; however, they work together as an integral combination at the same time. The presentation of the lesson through the internet and the organization of classes and users are completely undertaken by the automation and the users are able to accomplish their tasks easily with simple menus. By establishing responsible groups to conduct surveys and evaluate them objectively, the system will constantly improve in this area. Furthermore, creating an effective and faultless automation depends on the team work of people who are experts in their field as well as experienced in distance education systems. The team must include field experts, educational designers, web designers and system administrators. It is a must to have a qualified and serious team work to apply a good quality distance education. Not only universities but also other educational institutions must work on web based education, give pace to their studies on this field and put the necessary effort to develop and spread this type of automation systems in other links of the education chain as well.
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Özgeçmiş

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