OPEN COURSEWARE OPPORTUNITIES
FOR ARCHITECTURE EDUCATION:
Anadolu University ANAPOD Experience

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ABSTRACT

Today, in every field of our lives, an efficient information access and mobility has become a prerequisite for the sustainability of all systems. Considering this fact, Internet technology is the fastest and the most proper media to access the required information worldwide, from our daily questions to scientific researches. Within this rapid development, many Internet compatible applications have been specialized to ease information access and sharing. Hence, internet inevitably becomes the top asset for obtaining the inputs, sharing the information and marketing goods and services. Increasing demand for web based education services is also one of the reflections of this rapid development. Internet based education models integrated with computer technologies provide the best and most efficient conclusions for mass education. To meet the mentioned demands and needs, Anadolu University, has been providing higher education opportunities through distance education since 1982. The University, with over 1.2 million distant students, is one of the leading universities in Turkey and the world. ANAPOD application is a new education model within University's distance education process, which is highly applicable for many disciplines. In this paper, ANAPOD experiences for the architecture education will be discussed.

Keywords: Open courseware, architecture education, distance education, Turkey.

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FROM TRADITIONAL EDUCATION TO INTERNET BASED EDUCATION (IBE)

The key concepts of today's information community are "to learn how to learn", "to learn how to choose" and "to know how to manage the necessary information". Depending on the changing conditions and growing technology, the main objectives of an education environment can be as follows:

> ➢ To be able to handle increasing information sets,
> ➢ To ease education process,
> ➢ To encourage and develop participatory and individual education,
> ➢ To create efficient methods for developing and evaluating education.

Based on the varying needs and living conditions, the participants (students, trainees etc) are no longer satisfied with a stagnant education environment. On the contrary, they mostly expect an active participation opportunity where information is individually assimilated and this expectation saddles the lecturers with new responsibilities. Besides, structuralism theory charges the lecturers with considerably more interactive tasks, while it also requires education activity to take place independent of space and time. Depending on these, distance education networks have become widespread. Distance education is mostly necessary to eliminate the space and time limitations for interdisciplinary postgraduate studies and education of lecturers. Thus, the borders between education institutes are removed, while information/resource accessibility opportunities become almost unlimited (Cabuk 2000) (Keegan 2006) (Mayadas et.all).

Since the internet was in use, accessing information in a global scope has become much easier. Besides educational resources in a wide range and varying quality could easily and freely be reached by people (Atkins, Brown & Hammond, 2007).The rapid increase in the number of Internet users motivated the growth of an enormously active web related industry.

The amazing advancements in information technologies, software sector and telecommunication field have also influenced the traditional education contexture. Positive features of the internet, such as easy and fast access and sharing opportunities, download and uploading capabilities, easy to find hardware and software requirements and utilization simplicity encourage the development of internet based education methods as well. In course of time, the use of internet as a teaching and learning medium became widespread and on-line serving of educational contents increased. Instead of communities who keep the knowledge under wraps but the ones who sharing it guide today's world.

For the sophisticated societies, sharing information is a component of their educational strategy. The fundamentals of open courseware materials and open educational resources grew in the context of the thought: "sharing the knowledge increases and develops the knowledge." With the assistance of technology, presenting a course in a digital medium makes the content available for teachers, students and anyone who is concerned. This situation also grows the competition between the educators and content developers that leads to increase the quality of educational resources (Yazıcı, Ozkul & Cagıltay, 2008).

Besides, these open accessible resources can give a chance for institutions to advertise (popularize) themselves free of charge and an effective way of supporting lifelong learning (Yazıcı, Ozkul & Cagıltay, 2008).

Today, considering the competition in the education field, the success criteria is mostly defined with the information transfer speed and the number of demanders accessed, who are not only the students but also the communities as large as possible.

Hence, traditional lecturer-classroom-lecture approaches inevitably undergo a change so that several lecturers specialized on different subjects come together to guide the students. Many students from many different places wish to access the lecturers and information materials at different places. The most proper way to handle this problem is creating an Internet based education (IBE) model. Besides overcoming the space and time problems, IBE provides universal education quality and accreditation of similar education programs. With an IBE, users can also have the opportunity to benefit from the experiences and knowledge of administrators and authorized personnel. Regarding these advancements in the field, development of Internet based education programs and related applications has become one of the most important research topics for IT experts and researchers for the last 20 years.

In this context, after the introduction of Internet in the early 1990s, IBE has been one of the most popular applications. However, the content in the 90s lacked audiovisual components. As the bandwidth of Internet backbone increased and peer networking technologies became widespread globally, 2000s marked the beginning of the audio revolution on the web. Voice of IP, MP3, Internet telephony and audio compression tools became buzzwords in the technology area. On the other hand, video-broadcasting technologies began to take momentum. MPEG and H.264 compression technologies became dominant in the video processing area. Year 2007 is known as the beginning of the mobile device era. Mobile units, such as iPhone, iPod touch, Microsoft Zune, Sony PSP are some of the successful devices that provide multimedia and Internet experience to their users. Traditional computer aided education models contain intensive inducements and are over individual-focused. Considering advanced Internet and intranet technologies, this traditional method is no more applicable. Today, new and different items are required for a modern education process. Within this process, the capability to distribute the lectures via Internet or intranet and making downloads possible any time bring great advantages. The research results show that, the method used to introduce the information is much more important than the tools. Consequently, it is essential to choose the right method for an IBE program to meet the needs of the participants. Comparing IBE with the traditional education methods, research results show that;

> ➢ IBE participants can learn the same amount of information 30 % faster than the participants of a traditional education environment.
> ➢ During the traditional education, the elder participants can learn easily. However, learning speed is not influenced with age factor in IBE.
> ➢ Lecturers/educators tend to adopt traditional education methods.
> ➢ Audiovisual methods are effective for all participants.
> ➢ Communicational elements are not used as much as expected (Cabuk 2001, Cabuk 2004).

The most important point while developing an IBE program is to avoid wrong web page development strategies and mismanagement of education sites, since these will definitely end up with poorly or never benefited education material and information. This is why; proper technologies should be applied for preparing the education material. Utilization of multimedia tools eases the learning for the participants.

At the same time, it is significant to consider the necessity to transform images, video clips and audio files in the education material into formats easily and rapidly downloadable even at lower speed networks. In this regard, image resolution, duration and size of the video clip and audio quality are important factors.

Another important point for IBE is the physical and social aspects of the education. Every single item must be covering the objectives of the education. Although utilization of technological capabilities is advantageous to make the education attractive and versatile, it is also risky. For a successful IBE, the target group must be well examined and then the frame and components of the model must be carefully developed according to this target group. Besides, it is important to consider that technology is never enough to overcome pedagogic problems. In other words, a distance education model supported with a "face-to-face" education from time to time depending on the characteristics of the target group may be more advantageous than the models, which are totally independent of space and time. Nevertheless, the digital images and films, online sharing opportunities and other technological capabilities are still very essential for a modern and efficient education. To overcome probable problems, lecturers and/or other authorized personnel must be able to determine the needs of the participants correctly and than designate the most proper solutions and tools (Cabuk 2001).

Regarding the mentioned opportunities and problems, researchers started to look for "easy-to-use and easy-to-learn" solutions for the lecturers with a very basic computer knowledge and technological equipment handle capability. In the search for a better system, Apple Corporation's newly introduced operating system, Leopard, was beta-tested in 2007 and realized that Leopard podcast server coupled with a storage system could satisfy all the requirements for a large scale lecture recording project.

The podcast producer, which is embedded inside the operating system, enables the user to capture the screen and other video resources in full motion, and transmit to the encoder system over a network enabled Mac computer. The material, after the encoding, is published in the blog site of the course. The Wiki technology eases the process of appending text material.

In August 2007, purchasing of Mac server cluster having a 28TB of storage was finished. In October 2007, when Leopard operating system was released, the server cluster is updated with the new operating system. By the end of 2007, 100 Mbps of Internet bandwidth was dedicated to the system. Several tests were applied on the system and bugs were resolved.

Open Educational Resources and Open Courseware

Open Educational Resources (OER) are the teaching, learning and researching materials. The term was first adopted in UNESCO's 2002 forum "On the Impact of Open Courseware for Higher Education in Developing Countries" which was funded by William and Flora Hewlett Foundation. It covers these three titles:

> ➢ *Learning content: full courses, course materials, content modules, learning objects, collections, and journals,*
> ➢ *Tools: Software to support the creation, delivery, use and improvement of open learning content including searching and organization of content, content and learning management systems, content development tools, and on-line learning communities.*
> ➢ *Implementation resources: Intellectual property licenses to promote open publishing of materials, design-principles, and localization of content (Wikipedia, 2008).*

The idea of sharing course materials open and free to everyone via Internet was first propounded by MIT in 1999, while discussing how to use Internet better for student's education.

On April 4, 2001, the President of MIT announced that in the concept of a new program, which shall be known as MIT Open Courseware, the institute would publish nearly all of its courses freely available on the Internet over the next 10 years (MIT, 2001).

In the year 2002, MIT published pilot version with 50 courses including Spanish and Portuguese translations. Thenceforth, over 1800 courses in 33 disciplines were published by November, 2007 (MIT, 2008).

In 2005, MIT and other leading open educational resource projects such as wikis, on-line archives, formed the Open Courseware Consortium to broaden the impact and effectiveness of open educational materials, support new projects and develop sustainable models for publication (Wikipedia, 2008).

Today Open Courseware attempt is growing rapidly day-by-day. Over 250 universities, more than 3000 lessons are available worldwide, as from the end of May, 2008.

Although, there are many practices publishing the educational content open and free all around the world, Turkey has just engaged to this approach. The Turkish Academy of Sciences (TUBA) carried out the major attempt in Turkish higher education system (Yazıcı, Cagıltay &Ozkul, 2008).

Under the leadership of TUBA, National Open Courseware meeting was held on 23 of March 2007. 24 universities, YOK (The Council of Higher Education of the Republic of Turkey), TUBITAK (The Scientific and Technological Research Council of Turkey) and DPT (Prime Ministry State Planning Organization) attended this meeting. Later on, 25th of May 2007, National Open Courseware Consortium was formed with participation of 45 universities. At the end 2007 Anadolu University has started researching to develop its own materials. During the year 2007 basic facilities were developed and the preparation of course materials was started.

Internet Based Education Experience of Anadolu University
The idea of the project is based on asyncronized distance education experience of Anadolu University.

Asyncronized education can be defined as a training model in which lecturers and students are in different locations during the most or all parts of the education, or in which education is independent of place and/or time, or half dependent on place and/or time. Previously the asyncronized education programmes performed through audio-visual cassettes or communication devices. Nowadays this training model are transported to internet because of the advantages of the internet technologies. Internet aided asyncronised training models are given below:

- ➢ *Fully independent of place and time* **and totally performed through internet.**
- ➢ *Fully independent of place and half independent of time* **and lecturers and students are never in same location and students are trained using internet independent of time but lecturers answer the questions using internet relay chat during particular hours.**
- ➢ *Fully independent of place and fully dependent on time;* **this training model is performed through internet or video conferences, the lecturer and students are in diferent places but lectures are given by the lecturer on previously determined hours**
- ➢ *Dependent on places and half independent of time;* **this training model is performed with electronic discusions**
- ➢ *Half independent of time and places,* **some parts of this model are face to face using traditional education models and some parts are asyncronized and place and time independent (Cabuk 2000, 2004).**

In 2004, Anadolu University started an initiative to produce lecture materials that are based on vocalized presentations. Due to high computational requirements of authoring software, the initiative failed to acquire a high adoption rate among lecturers. Moreover, additional time and skills were needed to prepare for the deployment of materials on web sites. Another approach was to capture class hours on the video using some of the professional staff who is in charge of preparing materials for the distance education programs of Anadolu University. A crew was formed to edit the video material and to encode with sufficient quality for the web. However, the production rate of the crew was not sufficient to record many lectures in a short time.

The experience showed that the system for the acquisition of class materials had to be done by the lecturer. Such a system should not require a high level technical expertise and can be run by a regular computer user. If a computer desktop screen is captured in full motion together with the sound input from a microphone, a sufficient recording environment can be satisfied. Recording can be accomplished on a computer, but encoding and publishing on the web should be automatic.

Anadolu University presented two significant projects in 2007. One of the projects was the "Yunus Emre Portal", which made more than a hundred lectures of distance education programme accessible via Internet all over Turkey. The second one, "Turkish Certificate Program", was also a web-based project including an education programme to teach Turkish language through the Internet the worldwide.

ANAPOD lecture portal project was first developed to provide an easy transfer process of any lecture material and activities of Anadolu University into the web environment easily. The address of the system was determined as "http://anapod.anadolu.edu.tr" (Figure: 1).

When the podcast producer system was stabilized after a series of patches released by Apple Corporation, a team of academic staff from various technical and social backgrounds was formed by the president of Anadolu University in April 2008.By courtesy of the technical infrastructure of ANAPOD project, lecturers recorded their lectures and other lecture materials with a laptop and transferred them into the website as an audio or video file easily. Blog and wiki technologies were used to present these transferred materials in the Internet environment. With the blog technology, which is also known as the Internet diary, the entire context recorded was illustrated on the blog page of the related lecture according to the date order. Wiki technology, on the other hand, enabled the lecturers to give lecture comments. A technical support team was also established to train the academic staff and manage the system. Two day training was held to get the team members acquainted with the MacOS operating system. A series of meetings were also organized to collect the requirements of the team, to assess the progress and to deal with difficulties. These meetings provided the list of required devices that can be used in the project as follows:

1. A high definition camera with firewire connection
2. HD Visualizer
3. Professional wireless audio devices
4. USB omni microphone
5. Electronic board

During the summer of 2008, team members prepared materials for eight courses. This pilot project has proven that ANAPOD project can be easily used to produce materials during class hours and course content can be enriched in a cumulative fashion. In October 2008, the University administration decided to extend the project scale and started a large scale initiative to use the system.To view the lecture contents on the website, Quicktime software is required. Itunes software is also necessary to enable the download. The list of lectures broadcasted within ANAPOD Project can be accessed from the main page. There are two different methods to view the lecture contents:

> Directly via Quicktime software from AnaPod main page. The aimed lecture must be selected from the list on the ANAPOD main page to open the wiki page of the lecture. Then the link to the aimed lecture is clicked on either wiki or blog page (blog link exists on the up right corner of the wiki page) to view it with Quicktime software.

Figure: 1
Anadolu University Anapod Lecture Portal
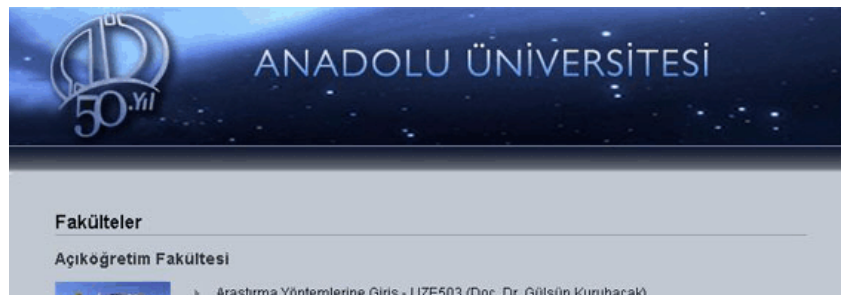
By downloading the lectures as podcast broadcasting via iTunes software. The aimed lecture must be selected from the list on the AnaPod main page to open the wiki page of the lecture. Then the blog link on the up right corner the wiki page is clicked. On the blog page, "subscribe in iTunes" link is selected for subscription to the aimed lecture. After this subscription, iTunes programme is automatically started.

Using the Postcasts link on the iTunes menu, subscribed lectures and related podcast subjects can be viewed. GET ALL links on the left of the lecture titles can be chosen to download entire podcast subjects. It is also possible to select only required podcast subjects by using GET links left to the subject titles. Once download is complete, the selected items can be viewed (Figure 2).

Figure: 2
Viewing lectures by downloading as podcast broadcasting via iTunes

ANAPOD Experience for Architecture Education

The main feature of the method given in this paper is its low installation cost and user friendly and efficient lecture material availability.

Anyone with basic computer knowledge can use the system easily.

The system may be either simply made up of a network and an Apple computer connected to the podcast server via this network, or equipped with more complicated multimedia software and hardware. Whichever it is, the system basically records and broadcasts any active image on the computer monitor.

The system established for the sample lecture explained in this paper includes (Figure. 3);

> ➢ A Mac Pro hardware with WM Ware Fusion software and Windows XP running on a MacOS operating system,
> ➢ Podcast and Screen Flow software,
> ➢ A wireless microphone connected to the computer,
> ➢ Avervision visualizer,
> ➢ 2 handy cams.

| a. Microphone system | b.Mac pro computer and cameras | c.Visualizer |

Figure: 3
Equipment used for the sample lecture

Visualizer is one of the important tools required for the preparation of open education lecture material. There is a wide range of visualizers with different brands and prices. Avervision SPC300, Avervision SPB350, Canon RE455X, Pro Max DP550, Avervision SPB370 document cameras and visualizers are between 1500-2000 USD. VZ-7D / VZ-5F models of WolfVision are also considerable affordable. VZ-27plus / VZ-57plus models, on the other hand, are at higher prices, but they provide more professional solutions. Visualizers are used for the following purposes for the architecture education (Figure 4);

> **Examining the hardcopy student projects (Figure: 5),**
> **Broadcasting the project critics as online lecture material,**
> **Transferring the hardcopy lecture material into the computer environment.**

The main properties of the mentioned visualizers should be as follows:

> **Production of a very strong and stable picture**
> **Smooth auto iris and smart auto focus**
> **No blinding stray light from visualizer, (which could disturb the auto iris of the room camera),**
> **Special crystalline white working surface for perfect reproduction of transparencies.**
> **Attachment for slides (diapositives)**

If the projects on the desks are to be directly transferred as the lecture material through Internet, then a ceiling visualizer is required. VZ-C12/VZ–C32 models of Wolfvision can be used for this purpose. Advantages of the Wolfvision Ceiling Visualizer series:

> **No unit on the table**
> **Objects can be easily moved anywhere on the table**
> **Visualizer can be completely hidden in a suspended ceiling**
> **Fixed installed unit can hardly be stolen**
> **No cables on the table**
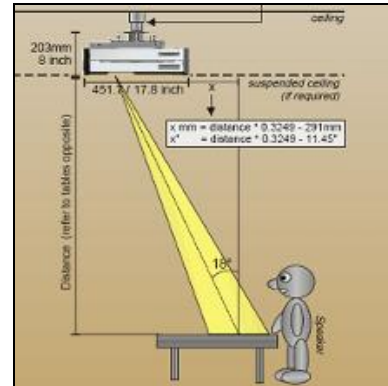> **Objects can be even larger and higher**

Figure: 4
Use of Visualizers

| a.Visualizers used as documenting camera | b. Visualizers used for transferring the slides a online lecture material | c. Calculation of the distance for ceiling visualizer |

Figure: 5
Screen captured image from the ANAPOD "Ecological Planning and Design" Open Course Materials (project examination using visualizer)

Another important hardware for examining the digitally prepared student projects is the tablets. These tablets are mostly at affordable prices (Figure: 6).

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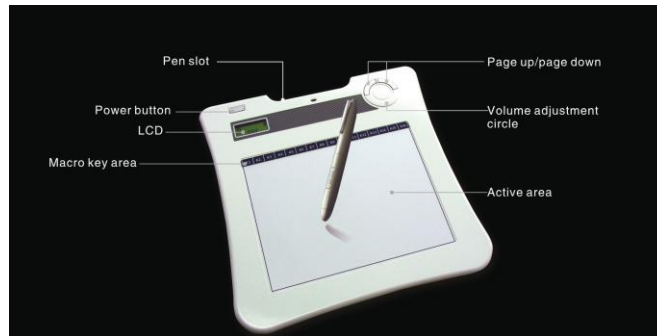
Figure: 6
Tablet

As explained in the previous chapter, the system has two components. The wiki page runs like a word processor. It is easy to use and contains various links and images (Figure: 7). The other component is the blog page. All the files transferred to the podcast server are automatically titled and presented on the blog page (Figure 8). In order to view the blog page lecture material and clips on the wiki page, the link line to the blog page lecture material on the wiki page is clicked. The following steps are realized during the preparation of lecture materials;

> ➢ Every lecture material are attached on the wiki page,
> ➢ Helpful web links are given,
> ➢ Screen flow software is used during the preparation of lecture materials,
> ➢ Student project examination process are presented as online lecture material via visualizers,
> ➢ Lectures and project evaluation processes are recorded to be broadcasted as online lecture material

CONCLUSIONS

The method and the tools explained in this paper provide an efficient and an easy-to-handle IBE environment for both lecturers and students, which also ease and expedite the application process of accreditation system for architecture education.
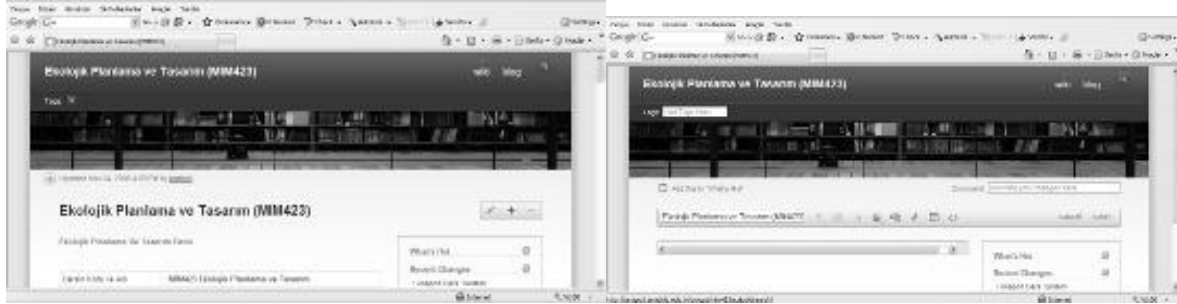
This system can be used during the accreditation progress of architecture departments in Turkey, especially for improving teaching ability of new architecture departments using open courseware.

Without any difficult missions or burdens, whole lecture materials and project evaluations are shared online. Hence, the method discussed in this paper, is an important asset for the preparation and broadcasting of IBE lecture materials for the architecture schools in Turkey.

With this application, the sharing between the schools becomes more effective and so the education quality is increased in the country. The most significant feature of the system is its simplicity.

Anyone with basic computer knowledge can use the system. Compared to the fixed videoconference systems, mobile lecture materials can be more easily prepared with this method without the help of an operator or a system director.

The installation cost is considerably low and operations are easy.

Figure: 7
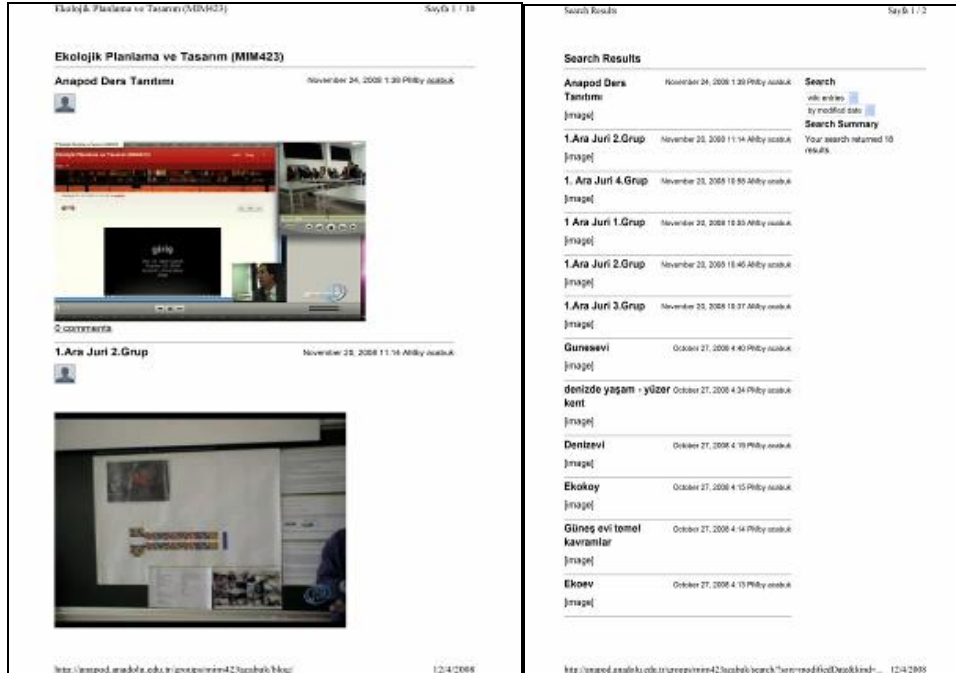**Ecological planning and design lecture wiki page and page editing tools.**

Figure: 8
Ecological planning and design lecture blog page

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