Converging of Virtual and Traditional University Teaching for Educating Digital Generation: Class Simulcasting and Backchanneling

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Abstract - Modern information technology has greatly impacted the administrative and instructional environment of higher education. Last two decades, it has been providing benefits to campus operational management and program instruction. Careful incorporation of information technology has become a vital operational goal for many institutions of higher education as they move toward the digital campus. As an institution the vision of the digital campus takes on an added importance. Istanbul Aydın University (IAU) launched its digital campus initiatives in the last six years using a systematic approach to achieve its intended goals. Five phases of activities have been defined and pursued since then.

1.Introduction

Virtual University/eLearning/Digital Campus/Distance Education degree programs are regarded as second quality educational programs and not valued highly by the students, parents and employers in the country. Fee for a face-to-face bachelor degree program is around 12,000 USD/year, but it is only 2,000 USD/year or even lower for Distance Education degree programs. In general, students whose university entrance exam scores are not high enough to go to face-to-face degree programs or who are working usually enroll these distance education programs. Therefore, diplomas from Distance Education programs including Open University are not valued highly in the country. This is one of the problems with "Virtual University/eLearning/Digital Campus" Degree Programs. Another problem, in average, it takes face-to-face students two hours to come to school and another two hours to get back home everyday in İstanbul with 16 million people. This problem is getting worse everyday. Some days of the week, face-to-face students spend four hours for commuting to attend only two or three hours of lecture usually starting at 8 a.m. And finally, Turkish Higher Education Council (Yuksek Ogretim Kurumu-YOK) nowadays mandates the widespread adoption of the Bologna Process in Turkish universities and comply with Bologna Process by 2013 and apply for European Credit and Transfer System (ECTS) label and Diploma Supplement (DS) as it makes teaching and learning in higher education more transparent across Europe and facilitates the recognition of all studies. The system allows for the transfer of learning experiences between different institutions, greater student mobility and more flexible routes to gain degrees. It also offers a systematic approach to curriculum design as well as quality assessment and improvement and, thus, quality assurance.

Solution to the problems mentioned above, Istanbul Aydın University (IAU) launched its unified digital campus initiative using a systematic approach to achieve its intended goal of converging its traditional and virtual university degree programs. Five phases of activities have been defined and pursued since then. It is a portal for all its needs, student admission processes, timely collection of fees, classrooms and management, acurate processing of exam results, assuring parents of their children progress, empowering teachers with content tools and much more. Unified Digital Campus is available in several formats – Faculty/Staff Edition, Student Edition, Education and Training Portal (EBS, (http://ebs.aydin.edu.tr), and Administrative Portal etc. Besides, for the time being, its Distance Education portal provides Course Management System, live streaming of lectures, live conversation with its

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students, multimedia course development, instruction design center, disciplined scheduling of classes, recording and saving of lectures, providing lecture videos on demand, accurate processing of exam results etc. Students can print syllabi and lectures, access video and audio provided by faculty, engage in discussions with fellow students, meet faculty and students in a virtual classroom, submit assignments, take quizzes and exams online, check grades etc.

İstanbul Aydın University, as one of the national and international strategic targets to be achieved, has adopted the use of ECTS system as a reference and transparency tool to design and describe the study programmes and their educational components and learning activities, based on the educational objectives and learning outcomes, in relation and compliance with the level requirements of the Turkish Qualifications Framework and its fields of studies in Higher Education, and use its features such as credit allocation based on student workload, learning, teaching, assessment and grading methods for designing, implementing, reviewing, improving and assuring the quality in educational and training processes. We have already completed Bologna Process work including information about the institution, and first, second and third cycle degree programs to apply for ECTS label for the university in May of 2011. We have populated the university course management system with all the teaching materials used in 6,700 courses. Now, work in progress, streaming of live lectures to an iPad, iPhone or iPod Touch via WiFi or 3G will enable IAU face-to-face students to attend the lectures, ask questions in real-time to their instructors and peers without coming to the university if they want. Students will come to class with their iPhone/iPad or remotely attend the class using their iPod or iPad because all classess will be websimulcast. All class recordings will be linked to the students' notes which can be captured with a special electronic pen on regular paper, making it an affordable capability for every student. Synchronizing student notes with recorded lectures will make study more effective and efficient(Figure 5). Student will be able to click on any of his/her class note to bring the instructor back to explain again. Students can search across their course recordings for any word or phrase presented on-screen in a PowerPoint slide, web page or other application. During class, students can click a button on their Phone, iPod or browser to set a private, or public (to share with the class) bookmark for later review (Figures 4 and 5). Students can send chats to their classmates or instructors which have a link that will take them directly to the point in the recording they were viewing at the time they sent it. With Twitter and other microblogging platforms, teachers from elementary schools to universities are setting up what is known as a "backchannel" in their classes (Figure 1). The real-time digital streams allow students to comment, pose questions (answered either by one another or the teacher) and shed inhibitions about voicing opinions. Perhaps most importantly, if they are texting on-task, they are less likely to be texting about something else. Now, Erin Olson, an English teacher in Sioux Rapids, Iowa, is among a small but growing cadre of educators trying to exploit Twitter-like technology to enhance classroom discussion. Instead of being a distraction — an electronic version of note-passing —social media, once kept outside the school door, can entice students who rarely raise a hand to express themselves via a medium they find as natural as breathing. Today's Meet, used by Mrs. Olson, sets up a virtual "room.". Purdue University, in Indiana, developed its own backchannel system, Hot Seat, two years ago, at a cost of $84,000. It lets students post comments and questions, which can be read on laptops or smartphones or projected on a large screen. The real-time digital streams allow students to comment, pose questions (answered either by one another or the teacher) and shed inhibitions about voicing opinions. Students may also record speeches & multimedia presentations to submit assignments, collaborate with classmates, or create electronic portfolios. And finally, we will use remote proctoring feature ensures the integrity of exams taken remotely, offering the institution and its students the utmost in flexibility, especially for our students who work and enrolled in second and third cycle programs.

Prime Minister Recep Tayyip Erdogan has promised to give an electronic book (iPad) to every student free of charge in elemantary and secondary education in his election campaign in May, 2011(Figures 2 and 3). He has been giving the books free of charge to the students of elimantary and secondary schools for the last eight years. He also said all the print boks used in the education of these children will also be available as eBooks and downloaded to their electronic books(iPad). He also promises homeschooling, simulcasting of classess etc. will soon begin and students will be able to attend classess from remote villages or their homes without having to come to school. Live streaming of classes and students following the lectures remotely and participating the live class discussions from their homes is becoming a state policy after June 2011 election (Figures 2 and 3).

In conlusion, seventy percent class attandence will no longer be required for the face-to-face students. With the completion of the final phase of the Unified Digital Campus, İstanbul Aydin University, will become the first converged traditional and virtual University offering traditional university degrees for all of its students.

Figure 1. Erin Olson, an English teacher in Sioux Rapids, Iowa, uses Twitter-like technology to enhance classroom discussion.

Wasn't it just the other day that teachers confiscated cellphones and principals warned about oversharing on MySpace?

Now, Erin Olson, an English teacher in Sioux Rapids, Iowa, is among a small but growing cadre of educators trying to exploit Twitter-like technology to enhance classroom discussion (Figure 1).

Başbakan'dan çocuklara 'elektronik kitap' müjdesi!

Başbakan Recep Tayyip Erdoğan, "Her yavrumuza bir elektronik kitap vereceğiz. Bütün müfredat bunun içerisinde var. İcabında bununla gidip geleceksin, başka bir şeye gerek yok, hazine bu hazine. Bunlardan ücret almayacağız, ücretsiz olarak biz bunları sizlere vereceğiz" dedi.

Figure 2. Prime Minister Recep Tayyip ERDOGAN in his election campaign promising electronic books (iPad) free of charge to every student

Figure 3. Prime Minister Recep Tayyip ERDOGAN in his election campaign promising electronic boks (iPad) free of charge to every student

2. Material and Methods

In September 2007, with the appointment of the Vice Rector as the team leader of Information Technology Committee (ITC) by the Chairman of Board of Trustees of IAU, IAU's portal solution, AYSIS (Aydin University Student/Staff Information System), was deployed replacing the old system. The ITC is the official university committee governing computer and network usage at İstanbul Aydin University and was expected to provide a central access point to university resources and services and that would be scalable and standards-based to facilitate growth and extensibility. The Vice Rector, Team Leader, and a total of sixteen team members are responsible for defining the portal's functionality, content and look & feel and system installation and administration, technical research & planning, customization tasks. AYSIS was developed totally in house. One major requirement was that AYSIS be capable of integratiing İstanbul Aydin University's Administrative Information System with Student Information System.

At the end of Phase I of Unified Digital Campus Project of İstanbul Aydın University, AYSIS provided 39,000+ faculty, staff, students, alumni, and affiliates with single sign-on access to various information services in one location. Users could access e-mail, electronic calendars, administrative self-services, course supplements, chat rooms, message boards, multiple search engines, access to full-text journals and databases, receive targeted announcements. All classrooms and laboratories on campus were networked and having access to the Internet. In addition, a Web-based Learning Resources facility was developed to support instructors in their course management and students for information sharing and increasing learning efficiency. As a result, instructors can post course syllabi, handouts, assignments, grades, and other useful learning resources on the website; Teaching Assistants can post students' homework grades online, entertain student questions, and receive students' homework/project papers through the Internet; the students can use the online facility to check and update their personal contact information, check individual's own grades and study plan through this controlled website, including registration and bill payment.

In Phase II: The e-learning initiative for developing online instruction and distance learning capabilities began in 2007 with the goal of offering alternative modes of instruction for certain approved courses. The IAU-Distance

Education program was ready to run in fall of 2008. It offers a limited number of courses online (Computer Programming, Tourism and Hotel Management, e-MBA degree programs) concurrently with those offered in the traditional classroom delivery mode.

İstanbul Aydın University Unified Digital Campus (IAUDC) project aims to construct a meta-university by enabling users to retrieve educational contents of the worldwide universities. This model connects IAU to other universities' contents, while on the other hand, contents for our university is prepared by ourself. This model covers the whole worldwide universities, and enables to participate the lecture from anywhere.

In this Phase III of the Unified Digital Campus Project, EOBS, Education and Training Information System, http://ebs.aydin.edu.tr started with the appointment of Prof.Dr.Mehmet DURMAN, former rector of Sakarya University, to lead the Bologna Process Works in the University to apply for European Credit and Transfer System, ECTS label in May of 2011.

Under his auspieces, more than sixty staff members participated in the implementation of the Bologna Process The project implementation team (PIT), also called Bologna Group, included a representative from each as project stakeholder group, either heads of associate degree programs or first, bachelor's, and second and third cycle (Master and PhD degrees) programs. The stakeholder groups where selected by the university's senior vice-president, who was also team leader of AYSIS. Both the vice rector, Technical Leader, and Prof.DURMAN, Project Manager, worked together in Phase III. of the project. The remaining team members where assigned to one or more subcommittees. The Project Manager reported regularly to the Head of Board of Trustees.

The PIT decided to implement the portal within AYSIS. EBS of IAU was populated with over 6,700 courses. AYSIS is mainly comprised of System component Functional description, Administration Office, Lecture Hall Arranegements, Library, Course Catalogue, Forum, Developer's Toolbox, Performs the tasks of a university's registration office, A place where students 'take' their lectures, Gives access to electronic library and book-shop, Provides university information and details of courses, A place to post questions and comments and get replies, Provides facilities for adding and deleting courses.

The *Forum* facility is essentially an asynchronous conferencing tool; it allows users (students and staff) to post questions, comments and information relating to the various courses that are available. The *Developer'sToolbox* is primarily intended for course tutors and managers; it enables new courses to be added to the system and, if necessary, old ones to be deleted. In addition, it allows courses to be maintained—that is, the individual components of any given course can be modified or deleted, and new parts added. Because of the extensible way in which the toolbox has been designed and implemented, new functionality can always be added to it as and when the need arises.

As of May 2011, we have already completed the Information about the University, Information on the Degree Programs, and Information for the Students modules as part of Bologne Process works to apply for ECTS label.

In addition to populating AYSIS with the teaching materials, Power Point slides, lecture notes, videos, etc, now, we are in the process of populating the university course management system with recordings of every professor from every classroom. Class recordings will be linked to the students' notes, which can be captured with a special pen on regular paper, making it an affordable capability for every student. Virtual space will be created to enable visual communication through recognition of other participants mutually, to give opportunities to take feedback from participants to lecturer, and to promote communication among participants themselves.

We are collaborating with the University of Maryland University College (UMUC) to develop double degree/joint degree (Bachelor) programs in Business Management with UMUC and already admitted 12 students to this program in the Fall of 2010. Students who are enrolled into this program will be able to follow syncronous lectures delivered by the American professors from Maryland, USA and ask them question live during the class. Lectures will be recorded and stored in the database, and allows users to review the past lecture anytime. At the same time students will also have access to the online teaching materials of UMUC developed by the teaching faculty of UMUC in the USA.

3.Discussion

3.1. Real and Virtual Collaboration Lectures

In our elearning programs many classess at İstanbul Aydın University are broadcast live resulting in the atmosphere of real classroom to be extended to a scalable classroom over real and virtual environments (Figures 3

and 4) very similar to Kansai University [3-4]. The lecturers at IAU could also see the participants over the internet. It has been designed to enable visual communication through recognition of other participants, to get feedback from participants, and to promote communication among participants themselves. Lectures are stored in the database, and allows users to review the past lectures anytime.
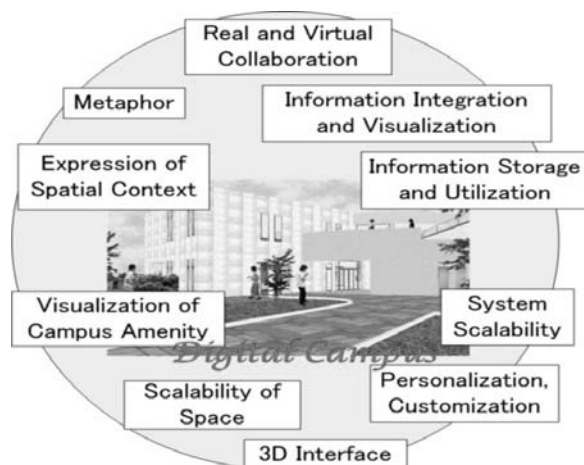
Figure 4. 3D collaborative virtual space (Ueshima, , 2004, 2007)

In Phase IV of the Unified Digital Campus Project, we are in the process of developing Instructional Archiving and Study system (Figure 5) which is a cloud base class/lecture capture system for students. We have already populated the university course management system with recordings of every professor teaching in e-learning programs. We will include the recordings of every professor from every classroom. We are also populating the system with the video tutorials made by the students of İstanbul Aydin University (Figures 6 and 7). All these video tutorials are available at http://ocwsoftwareengineering.org . We are using YouTube as cloud to upload the video tutorials and make links to these video tutorials in our open course ware web site.

Work in progress, we are planning to populate the university course management system with recordings of every professor from every classroom. Class recordings will be linked to the students' notes, which can be captured with a special pen on regular paper, making it an affordable capability for every student. Syncronizing student notes with recorded lectures will make study more effective and efficient. Student will be able to click on any of his/her class note to bring the instructor back to explain again. Students will spend less time searching for information. Their digital notes will be organized in a personal archive on their PC, conveniently accessed from within institution's course management system along with class recordings.

Whether they want to review a part of lecture, or refresh their memory before an exam, this system is like having professor on call to help student again anytime, anywhere Students can print syllabi and lectures, access video and audio provided by faculty, engage in discussions with fellow students, meet faculty and students in a virtual classroom, submit assignments, take quizzes and exams online, check grades etc.

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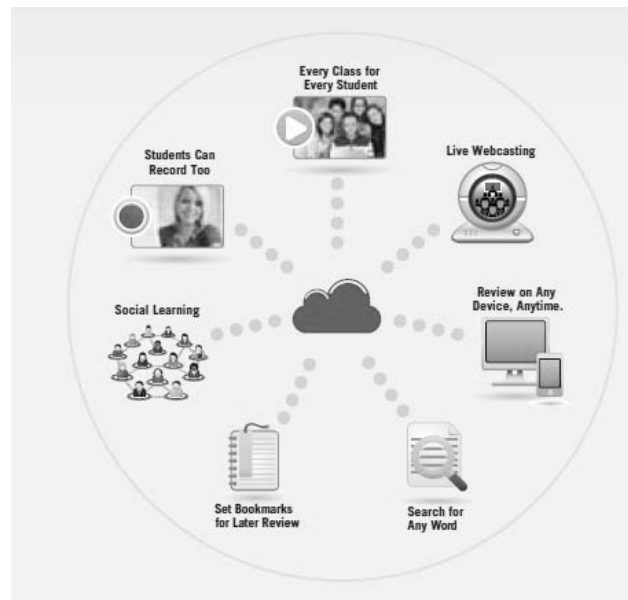
Figure 5. Instructional Archiving and Study system

Another important feature of the system is to make instruction available online automatically, with no change in behavior of instructor. Whether capturing and archiving classroom instruction, or creating quality materials for online courses, this system will make teaching easy regardless of the classroom, teaching style or technology expertise of the instructor. Because this system will capture every instructor automatically, with no training required by the instructor. There will be simple, one-click recording of slides and computer screen with audio/video, writing and drawing. Instructors will be able to use Tablet PC in the classrooms, who want to capture more of the classroom experience, including document camera video, software screen recording and multiple video sources, hi-resolution snapshots and annotation (Figures 4 and 5) etc. [5-6].
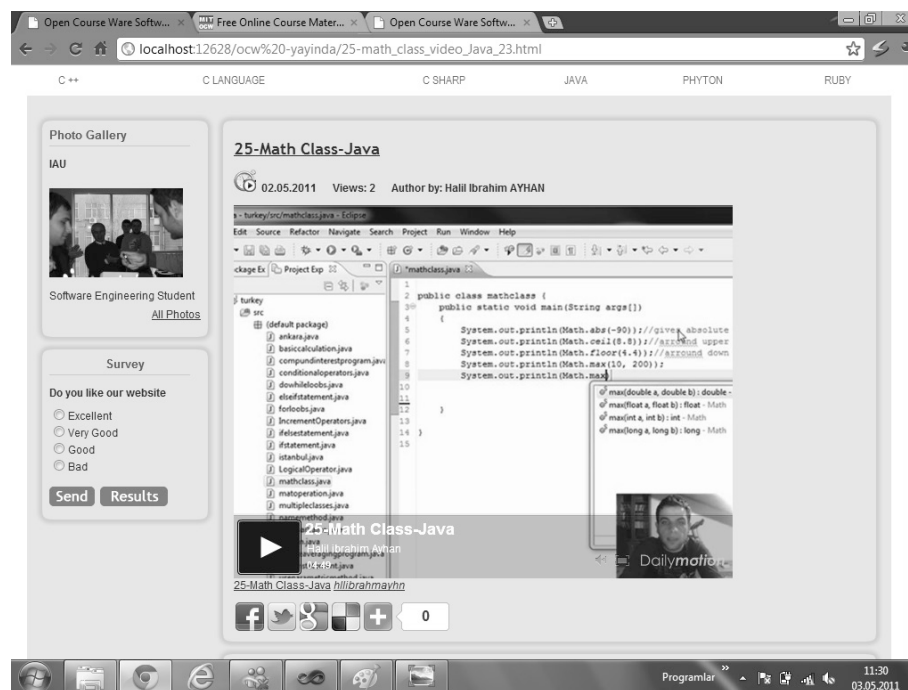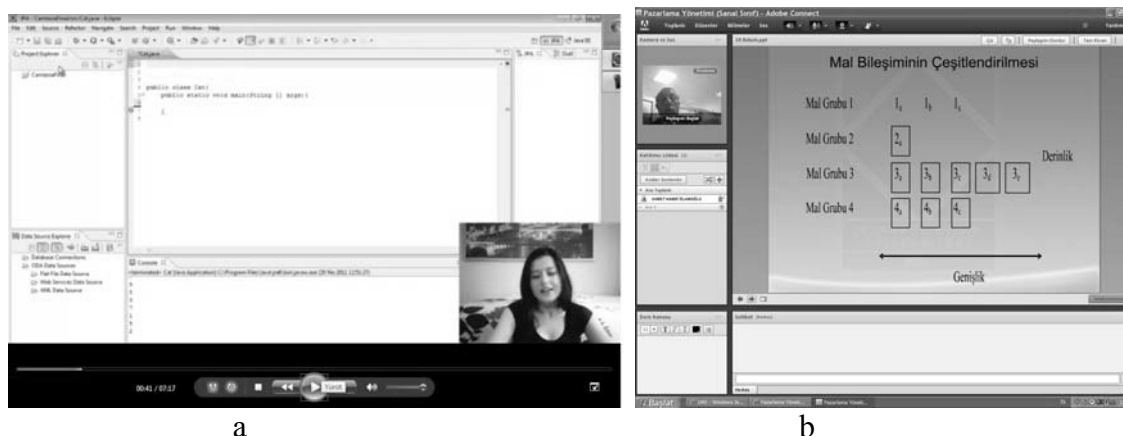

Figure 6. Screenshot of the web site of IAU open course ware tutorials made by students

Figure 7. Screenshot of the web site of IAU open course ware tutorials made by students(a) and live webcasting by a staff (b)

3.2.Advantages of Instructional Archiving and Study system

Live Webclasscasting; While recording, classes can also be broadcast live over the web for students to view from anywhere in real-time using a standard web-browser. Streaming of live lectures to an iPad, iPhone or iPod Touch via WiFi or 3G will enable IAU move on to Phase V: Mobile Hand Held Learning for Digital Students.

Review via Browser (PC or Mac); Students can view live or recorded lectures using a web-browser (IE, Firefox, Safari or Chrome).

Review on iPad, iPhone/iPod Touch or other Mobile Device; the system automatically creates MP3/M4B/M4V versions of each recording, and recordings can be streamed to an iPad, iPhone or iPod Touch via WiFi or 3G.

Search for Any Word Presented on Screen in Class; Students can search across their course recordings for any word or phrase presented on-screen in a PPT slide, web page or other application.

Set Bookmarks for Later Review; During class, students can click a button on their Phone, iPod or browser to set a private, or public (to share with the class) bookmark for later review.

Contextual Social Learning; Students can send chats to their classmates or instructors which have a link that will take them directly to the point in the recording they were viewing at the time they sent it.

Students Record Too; Students may record speeches & multimedia presentations to submit assignments, collaborate with classmates, or create electronic portfolios (Figures 6 and 7).

And finally *Remote Proctoring*: We will use remote proctoring feature ensures the integrity of exams taken remotely, offering the institution and its students the utmost in flexibility, especially for our students enrolled in e-learning programs.

Digital Campus created in Kansai University and Kyoto University in Japan in collaboration with George Mason University in the USA (3,4) have similar features. Digital Campus term is usually used for the universities which offer online degree programs, such as University of Minnesota Digital Campus, or management of campus information systems (7,8,9,10,12,14) .

The effectiveness of m-learning in the form of podcast revision lectures in higher education. (2), and Mobile Collaboration Tool for University Education have been previously reported (1). Development of an online – mobile phone environment -ViCaDiS – Virtual Campus for Digital Students, as a co-operation between 6 universities from European Union to develop a common online learning environment enhanced with web 2.0 tools for supporting the online international cooperation at academic level has been reported (13). The University of the Azores regards itself as a fully digital university- its administration is paperless and students are taught through video conferencing. An increasing number of postgraduate research courses are becoming distance-learning based, as students participate in video conference classes and virtual classrooms.

4. Conclusion

Digital Campus reduces 'papered' operations of administration and makes the university "paperless university" as requested by the Chairman of Board of Trustees.   The portal has provided significant improvement in communication methods, reduced course administration, improved account maintenance and support, and strategically aligned the university for the next generation of portals.

It brings the knowledge of the best teachers and the repository of best learning resources to the students. With technology enabled administration, teaching and knowledge management, İstanbul Aydin University Unified Digital Campus moved to its V. Phase of the project: *Live Webclasscasting and Hand Held Learning*: While recording, classes will also be broadcast live over the web for students to view from anywhere in real-time using a standard web-browser. Streaming of live lectures to an iPad, iPhone or iPod Touch via WiFi or 3G will enable IAU students to remotely attend the lectures, ask questions in real-time to their instructors and peers without coming to the University.

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