BAÜ FBE Dergisi
Cilt:10, Sayı:2, 33-52
Aralık 2008

A Proposal for Building up A Social-Constructivism -based Distance Learning System for Ege University

Bahadır KARASULU[1,*], Ata ÖNAL[1], Serdar KORUKOĞLU[1]
[1] Ege University Faculty of Engineering,
Department of Computer Engineeering, Universite Cad., Bornova 35100, Izmir, Turkey.

Abstract

At the present time, it is usually seen in many Universities and education institutions' usage of specific web-based Learning Management Systems (LMS) for Distance Learning. Moodle is one of those LMSs. Nowadays, in web-based education the absence of social-constructivist approach is a disadvantage of those LMSs. In our study, at first, we dealed with social-constructivist approach and then we examined in detail according to how it will affect on higher education students in a sample class which builded up with Moodle LMS and social-constructivist approach. Also, we introduce a Distance Learning System for Ege University, and conclusions are discussed with comparing this study with previous similar studies.

Keywords: *Distance Learning, e-learning, social-constructivist approach, moodle.*

Ege Üniversitesi İçin Sosyo-Yapısalcılık Tabanlı Bir Uzaktan Eğitim Sistemi'nin Oluşturulması İçin Bir Tasarı

Özet

Günümüzde, çeşitli üniversitelerin ve eğitim kuruluşlarının Uzaktan Eğitim için belirli ağ-tabanlı Öğrenme Yönetim Sistemleri'ni (ÖYS) kullandığı genelde görülmektedir. Moodle, bu ÖYS'lerden biridir. Ağ-tabanlı eğitimde sosyo-yapısalcı yaklaşımın eksikliği günümüzde bu ÖYS'lerin dezavantajlarından biridir. Bu çalışmamızda, ilk önce sosyo-yapısalcı yaklaşım ele alınmış ve sonrasında Moodle ÖYS ve sosyo-yapısalcı yaklaşım ile oluşturulan örnek bir sınıftaki yüksek öğrenim öğrencileri üzerinde ne gibi etkileri olabileceği ayrıntılı olarak incelenmiştir. Ayrıca, Ege Üniversitesi için bir Uzaktan Eğitim Sistemi önerilmektedir ve bu sistem daha önceki benzer çalışmalar ile karşılaştırılarak sonuçlar tartışılmaktadır.

Anahtar kelimeler: *Uzaktan Eğitim, e-öğrenme, sosyo-yapısalcı yaklaşım, moodle.*

[*] Bahadır KARASULU, bahadir.karasulu@ege.edu.tr, Tel: (232) 388 40 00 / 5321.

1. Introduction

Distance Learning paradigm is an older concept. Historically, in past two century with Letter Education (postal tution) the constructor's knowledge transfer to student like printed material and so radio, television etc. medium at concurrent or different time, but the perception occured different means and levels. In Turkey from 1927 to 1960 at various foundations began with Letter Education (postal tution) for student's education. In 1961, Letter Education Center established by Ministry of Education (MEB). This Center named after in 1974 Letter Higher Education Center and 1983 occupational and technical open education school [1]. In higher education the Distance Learning take place with Common Higher Education Foundation (YAYKUR) in 15 months after the process of 1983's Open Education School. Anadolu University's Open Education Faculty established with 2547 numbered Higher Education Law. In 1980 and 1990's systematic learning diffused at any layer of community like the radio of school and TV School [2].

Open Education High School is an foundation that used Distance Learning technologies with central system high school mechanism and it is in constitution of Radio and TV Education Chairmanship. Open Education High School program's context is like systematic education's common high schools' program, but structure and mechanism are different from other foundations and it has a spesific and centric qualified model. In Open Education High School, one education year has two semester. Students must be refresh their registrations over Internet in every semester (two times in year) at specified times. If students do not refresh their records over two semester, then their registration will be remove. In remove situated student's credits covered by school and then if they re-register themselfs, credits will be retake by these students, as well [3].

Developing web technologies and Internet bring an improvement to Distance Learning technologie. We can see the notableness of Distance Learning because of its efficiency, cost and productivity. Instructor and students may be physically far away from each other in Distance Learning. Distance Learning is a learning style and provided for desired person at desired age and desired place-time and desired speed of learning chance for everybody. According to Moore, in Distance Learning communication has three component: Student, Instructor and Communication method. Communication method is a bond between Student and Instructor [4]. This bond or medium occurs with any style of technologie. This can be a post, radio, TV broadcasting, cable broadcasting, computer network etc. Also, printed materials, audio, video and graphics are usable items for Distance Learning.

In web-based education the important part is underlying learning theory that must be feasible to online education. The objectivist learning model give place to constructivist learning model begin with World Wide Web (WWW)'s evolution. One of the greatest problem of education is perception problem. We can associate this problem with information transfer insufficiency or transfer media's unsuitability. In objectivist learning model, learning is a kind of transfer that flow from Instructor to Student. In Constructivist Learning model, its in opposite side and education is a part of active learning's process (e.g. duplex or same similar transfers) that a kind of transfer. Constructivism can be use for web-based technologies for more efficient education.

In our study, we reviewed constructivist learning and social-constructivist learning approach models and a Learning Management System's (LMS) suitability for these models (like Moodle LMS). And we examined how can we apply a sample course to higher education students community with this or similar models (and with Moodle LMS). These issues discussed in our study at second, third and fourth section with details. Method at our study is a sample course include participants like Instructor and Course Managers and Students and interactivity between these participants. Also, we introduce a Distance Learning System for Ege University at fifth section of our study, and conclusions are discussed with comparing this study with previous similar studies. Examined results and comparisons are given at fifth section, as well.

2. Differences between face-to-face learning and distance learning

In classical face-to-face inner class education, Instructor can be communicate with Student one-to-one and a kind of synchronize communication thus Instructors transfer their knowledge to students. When we deal with Turkey's social and economical structure, we can see except big cities (except big universities) largely young people that need education. In face-to-face education has not a specific quality standart for Turkey because of Turkey's every edge has not mature academic personels and some other reasons like technical possibilities. Education of face-to-face learning's Instructors is an another problem. These personels' educations take so long and is not equal for every necessity. In many years, researches come to a conclusion for some statistical reasons and results that Distance Learning and face-to-face learning is equal or maybe a little bit higher each other in some situations. These situations are related to technical component of education, student's perception level changes etc. Just now, students are mature people and working on a job and in their free time they will take the specific course or quizzes in Distance Learning.

Open University model in England and Hagen University model in Germany come to daily usage with Anadolu University in Turkey. The Distance Learning (education) with TV began from 1982 through Anadolu University Open Education Faculty to today. They supported then in closer time web-based studies and education. TV broadcasts supported by Turkish Radio TV Foundation (TRT) with collaboration of Anadolu University. In 2000, video conferencing and blackboard context of innerclass sending to another side (to another University) method used between Istanbul University and Harran University [5]. We can see with these examples like Istanbul and Harran Universities between technical possibilities and social-cultural differencies, life standart's differences are so big for each other, but necessities are covered by Distance Learning. In this example, it made up a collaboration for education. In America and Europe has some similar outsourcing examples like this. At first, the specialists stand up for face-to-face learning, but later time this has become unnecessary because of Instructor travel hundred kilometers and meet with their students two or less day. In Distance Learning, Student and Instructor are communicate a kind of asynchronize (not concurrent) each other whereas technical equipment may allow. Many Universities in Turkey works on Distance Learning. These Universities are METU, ITU, Bilgi University, Bahçeşehir University, Maltepe University (collaboration with Ahmet Yesevi University), Selçuk University, Marmara University, Bilkent University etc. These studies shows to us importance of Distance Learning.

2.1. Advantages and disadvantages of distance learning

Distance Learning provide some advantages like presenting to persons different education options, making easy of massive education, reducing education costs, increasing education quality etc. These advantages occurs a specific standart and facilitation for innerclass interaction for students. And it has a possibility for independent and individual (private) learning at same time [6]. Disadvantages of Distance Learning are difficulties for students with non-self-learning ability, not to be able to applied courses, differencies about learning sytle between face-to-face and Distance Learning method. These advantages bring on some reasons about technique for socializing level changes and communication technologies (for example depends on Internet-connected computers, other equipment for web-based education) [6, 7].

2.2. Education over Internet

Main concept of some distance communication possibilities except face-to-face learning results born of Distance Learning concept. Nowadays, Internet is an most important medium for Distance Learning, no doubt. Use of Internet made it different way for online discussion not like at a normal class, it gives these opportunities for every distance learner (Student). Many students having no desire for talking about lession at class because of uncertainty for knowledge or language problem. At an online discussion, students are more relaxed and their questions and answers are more certain. This situation's subject is time. Indeed, if they have enough time then they ask correct question and got correct answer.

Some disadvantages may be occurs with Internet because of idle surfing on it. Students may concern about other things except lesson. To keep this under control must be exist a more interesting lesson context. This is an important issue for less boring lessions. In some studies [8-10], talked about collaborative activities in organizational works come to a central point. The competition is a dominant value for problem solving and collaborative social networks which forms "knowledge community" idea. These issues are detailed in some studies [11-15]. In Putnam's study [15], talked about characteristics of bridging social capital and scientists works on bonding social capital [16-19]. These examples are given in these studies. To the end of 1980's Computer-Aided Instruction (CAI) made in isolated (solo) student mode. This situation is discussed in Bradley and Oliver's study [20]. Computer-Aided Instruction-based programs show us realizing of individual models according to constructivist principles in many mediums. This is discussed in Crook's study [21]. Computer Supported Collaborative Learning covers both theorics of collaborative learning models (face-to-face and online) and offers new software technologies for pedagogical meaning [22]. This situation is discussed usually in Journal of Computer Assisted Learning with details [23].

3. Constructivist and social-constructivist learning approach

Before lookup details of learning approaches we must look to sensation and perception issues, sensation called to "come in stimulation for individuals brain from inner or outer spaces of individuals to individual". Reaction of sensation called to "perception" which is a stimulator's recognition job. Individual's concentration on specific stimulators from outer space (around individual) called "selective perception" [24]. For example, in a class lesson listening student's situation, if student is very concentrated to lesson then

student do not hear sounds of outer of the class, but hear only Instructor's voice. Some inner and outer factors effect to perception. Outer factors are repeating, strangeness, changes, oppositions and enviromental reasons etc. Inner factors are necessities, expectations, experiences, interests etc.

Another important issue is perception organization hence individuals percepts stimulators a part of total. Importance of selective perception is effecting of interactivity. At this point for both side interaction effect on perception therefore it is important. Wagner's study [25], declare an interaction as "opposite events that require at least two action or two object". This covers face-to-face and Distance Learning. Muirhead and Juwah [26], described interaction as "a dialogue or is course or event between two or more participants and objects which occurs synchronously and/or asynchronously mediated by response or feedback and interfaced by technology". According to them, interaction serves synchronous or asynchronous.

Any interaction in web-based learning environment is not improve one effect always or not increase learning. An example for this issue is idle surfing in Internet hence it spend pointless time for surfing. This issue discussed on Vrasidas and McIsaac's study for meaningful interaction [27]. In Hirumi's study [28], discussed on effect of meaningful interaction in learning interaction quality. Also, there said that meaningful interaction offers not only individual's ideas sharing, but it must stimulate student's intellectual concerns. Changes of meaningful interaction discussed on some studies [29-31]. We must say that learning is a change of observation of behaviour and this named in Skinner's study [32]. In this study discussed on behaviorist learning theory as operant conditioning and Instruction levels must be reinforcement meaning (like "You gave correct answer!"). In Skinner's study [32], and other studies are told about behavorist learning interact with computer screen for student [30, 33]. A system approach showed in Banathy and Jenlik's study for efficient online learning mediums [34]. In 2002, Idaho State University's Instructional Technology Resource Center (ITRC) developed the WebCT Ordinal-Web Delivery Organization Companion (WOWDOC) to help students for online courses [35]. Beyond of compare constructivist and objectivist approach, social-constructivist approach offers more interaction and separate from constructivist approach with this meaning of learning.

3.1. Learning theories

Learning theories related to individual's what and how learns. Instruction design made a relation between these items' applications and learning theories. There are three main approaches: behaviorism, cognitivism, constructivisim approach. Additional to learning theories that talked about above, a social-constructivist and a collaborative learning approach consider interaction of individuals in social struct. Behavorist Learning approach's typical example is Pavlov's dog experiment (Respondent Conditioning or Classical Conditioning) and in this experiment dog produce a behovioral response (conditioned response). In Cognitivism, the learning is not observed directly from individuals, but it is a mental process. Famous cognitivists Piaget and Bruner are Gestalt school psychologists. According to additionally main approaches the affective approach, ego has four dimensions: academic, social, emotional and corporal [36]. In 1940s, John Dollard and Neal E. Miller seperated from behavorist theory and talked about "Imitation-based learning". In 1960s, Albert Bandurra improved Dollard and Miller's ideas and declare social-cognitivist theory's principles. Social-cognitivist

theory over first years defined as "observed learning", later "social-learning theory" [37].

3.2. Social-constructivist learning approach

There are many constructivist approaches in literature. They are social-interactivism, cognitive flexibility, radical constructivism etc. In Constructivist approach approves bringing previous knowledge by Instructor as well as Student. In Knowledge Building, the process for Student construct new knowledge is built onto former knowledge with piece-by-piece mean. In Tabula Rasa, the process for Student differs from Knowledge-Building that considered Student as empty vessels waiting to be filled. Tabula Rasa is more closer to objectivist approach. At this point we must say that individuals grown in social interaction-based communities like their family and environment (e.g. friends etc.). Social-constructivists are discussed about interconnectivity between individual objects and social communities. Students are participants for collaborative projects and homeworks. These issues are discussed in Stage et al.'s study [38]. Social-constructivists declares three idea for main process of learning:

- Zone of Proximal Development (ZPD), e.g increasing friendship.
- Intersubjectivity, e.g. bond for individuals,
- Enculturation, e.g. similar cultural feelings and actions.

In web-based authentic learning environments require for students' information era's abilities and critical global abilities which students are built their knowledge with several communication tools and collaborative works. Web-based learning environments with their common struct are open to social-constructivist approach and interaction. The important point is here which interaction is meaningful or not. For efficient course or lesson achieved by Instructor depends on interaction level and three ideas of social-constructivists (as told above). And some structs are mixed for social-constructivist approach like enculturalized ZPD. Students can be begin interpretation of their environment and Instructor can be support this. Moodle LMS has a kind of social-constructivist approach like this. Moodle's feasibility for social-constructivism based on Student-Student and Instructor-Student interactions, but it has some lacks.

The objectivist paradigm is based on the assumption that there is a real world and the purpose of education is to map the entities of that world on the learner's mind. The constructivist paradigm is based on the idea that reality is constructed during interaction with the environment and peers and that knowledge is both individual and communal. In a constructivist course the major goal is to cultivate the learners' thinking and knowledge construction skills [39, 40].

In learning environment design, the discussion about objectivism is not an appropriate philosophical approach. Thus, a learning design model developed by objectivist view is applicable to each area of learning. On the contrary, constructivism assume that the design of a learning process related a specific area will shape with this specific area's properties. Therefore, application of constructivist learning approach is so difficult for every learning area. According to constructivist instructional designers, when a knowledge construction type is valid and effective for a content area of learning, maybe it is not appropriate, valid and effective for another content area of learning. Consequently, the learning model design in constructivism is depend on content area of learning. Some radicals of each paradigm argue that is impossible to mix the two paradigms. One can either be an objectivist or a constructivist instructional designer

[39, 40]. In literature, there are some objectivist and/or constructivist instructional design models and their approach's applications which reviewed in Vrasidas (2000) study with their technical details [40]. The reader may refer to Vrasidas study's related sections and discussions for more information.

4. Moodle course management system

Moodle is a Course Management System (CMS), in literature also known as a Learning Management System (LMS) - a free, Open Source software package designed using pedagogical principles, to help educators create effective online learning communities. Moodle used in education organizations over 2000 at world-wide like universities, college communities, K-12 schools, business markets and etc. Moodle is downloadable on WWW. Moodle is a software package for producing internet-based courses and web sites [41]. It is an ongoing development project designed to support a social constructionist framework of education. The word Moodle was originally an acronym for Modular Object-Oriented Dynamic Learning Environment, which is mostly useful to programmers and education theorists [41, 42]. Moodle created by computer scientist Martin Dougiamas. Moodle is under GNU license and freeware. Moodle used to be in 195 country and 600 languages and has many registered users [42]. Moodle has some differencies from other LMSs (like closer follower A-tutor [43] Learning Content Management System (LCMS)) that module diversity and usage facilities are main reasons.

In Moodle website's download section (in modules and plugins subsection), there are some teleconferencing modules and plugins such as "OpenMeetings" (maintained by Sebastian Wagner and it supports audio and/or video conferencing and has an audience extra plugin for multiple participants), "Audioconferencias-Videoconferencias Meeting.cl" (maintained by Herman Jungue, Ivo Perich, Cristian Sepúlveda and it supports audio-video conferences, but it is in spanish language), "Audioconference module" (maintained by Rafael Marangoni). Also, there are some videoconferencing modules and plugins such as "Skype module" (maintained by Amr Hourani and it supports video calling, send files, chat, send short messages for cell phones, and use skype cast), "Covcell Audio/Video conferencing" (maintained by Covcell) and "Live Web Class plugin powered by Sclipo" (maintained by Gregor Gimmy and it is live teaching plugin allows Moodle users to teach live - classes, webinars and conferences - directly from Moodle at inside web browser) [41]. The video conferencing has some bandwidth bottlenecks because of low-end servers which are located far away in different places of the world. For this reason, videoconferencing modules and/or plugins supports only-audio or only-text modes, as well. One can strongly consider this dilemma in design stage of a complete audio-visual based LMS system.

Moodle supports also audio and/or video materials' recording, sending, presentation or conversion modules and or plugins such as "Video Conversion" (maintained by Richard Haywood and it supports video conversion to .flv and .avi for mp4 players), "Video-class Streaming" (maintained by Rafael Marangoni and it permits on-line video-classes using streaming), "VideoVista For Moodle" (maintained by vista.it website and it is based on use of VideoVista for streaming video lesson and synchronize it with slides (in .swf format or as text and image) and subtitle), "Inwicast Mediacenter" (maintained by inwicast.com website and it is a block module which adds multimedia capabilites to

Moodle so that teachers can easily publish, manage and share audio and video podcasts in various formats (flash .flv, .mp3, .mp4, .wmv, .mov, etc). Inwicast Mediacenter can manage uploaded podcasts as well as videos hosted on distant servers like Youtube, Google Video or Dailymotion). These modules and/or plugins details and download links are given in Moodle website [41].

4.1. Comparison of Moodle vs. other LMSs

LMSs are web applications because of they works on a server and can be browse with a web browser. This server is commonly at universities or related department, but may be anywhere in the world. Instructor or Student access to system through Internet connection. More basic concept of LMS is an access control of registered-only student's viewable webpages through education tools and course pages which Student need to learn lessons. LMSs supports many tools for efficient lessons. In many century, humankind made face-to-face Instruction. These methods are still active, but they are more useless or ineffective for problem solving time's decreament. For this reason, Instructors uses "hybrid" approaches. All Instructors must make together online and face-to-face learning approaches benefits. Hybrid courses have best sides of online and face-to-face approaches. If content transfered to online (web site) then discussions are more effective and not to be taking big time. Moodle has some advantages according to other LMSs therefore its feature set and expandability [41]. In Table 1, it shown as feature set of WebCT, Blackboard and Moodle.

Table 1. Comparison of WebCT, Blackboard and Moodle.

Feature	Blackboard	WebCT	Moodle
Upload and share documents	Yes	Yes	Yes
Create content online in HTML	No	Yes	Yes
Online Discussions	Yes	Yes	Yes
Grade discussions / participation	No	Yes	Yes
Online Chat	Yes	Yes	Yes
Student peer review	No	No	Yes
Online Quizzes / Surveys	Yes	Yes	Yes
Online Gradebook	Yes	Yes	Yes
Student submission of documents	Yes	Yes	Yes
Self-assessment of submission	No	No	Yes
Student workgroups	Yes	Yes	Yes
Lessons with paths	Yes	Yes	Yes
Student Journals	No	No	Yes
Embedded glossary	No	No	Yes

5. Our method

There is still no any similar (integrated) social-constructivist approach-based LMS system for Ege University. If we review Distance Learning typology, it give us some relation dimensions between Student-Student and Instructor-Student interactions. These dimensions are communication's flow direction, identifying pyhsical medium and communication medium etc. Communication direction is online or offline. And in details it can be simplex, half-duplex or full-duplex communication. In our study, we review for bringing together audio, video and computer in a mixage which it offer full-

duplex communication and concurrent communication for both side (Instructor or Student). In this system, we offer audio transfer with teleconferencing and video transfer with video conferencing (and sound additionally for video). Except this communication styles, we must supply half-duplex communication like e-mail (for website informations) and course material distributions. For system's integration, we should supply audio materials (e.g. .wav, .mp3 etc.) and video materials (e.g. .asf, .wmv etc.), as well. Computer-based discussions can be included in this system collaborative brain storming over common issues. Moodle has forum and/or wiki modules which are usable for this purpose. As told above, Moodle has additionally some modules and plugins in its website and/or in other developers' websites for audio teleconferencing, video conferencing and/or audio-video material recording, sending or format conversion purpose [41]. At first, in our system's testing stage, these modules or plugins can be used in our system, then we must design and implement our own sub-system to audio-video transfer for conferencing.

Another important issue is student's homework-project or work's presentations and/or materials as student performances. Except this Instructor's presentations for distance learners are very important, of course students needs to present their online or offline recorded presentations. In our system, it must more alike of videolectures.net website because of online presentation capabilities (e.g. a must item is same feelings as videolectures.net website's videos in our system) [44]. Videolectures.net 's website publish some video records from some speaker (we must taking examples like this for our design). These video records formats are many kind of video formats like .asf, .wmv, .avi etc. The video in webpage is shown on left pane of site and presentation is shown at right pane (presentation is moving with time scale and eligible time bar). These videos are published as open to the public. We must design our system that it is perfect as much as possible, but it has some lacks naturally. This cause to communication anomalies or lacks (e.g. half-duplex communication instead of full-duplex). For this reasons we must follow a chart with Moodle and look for in our system some small notes and some small discussions for related Student and/or Instructor's performances.

We must consider bandwidth bottlenecks of Ege University's infrastructure for system's communication. We must design our system with multi-server and other necessary high-end equipments which are supported and owned already by Ege University's Network Management Group (NYG-BİTAM). Multi-server infrastructure is a requirement for a stable, recoverable from disaster and continuously online distance learning system. In this system, each server works as collaborative with other servers. This system is more suitable for Ege University's possible distance learning projects because of its reachability (e.g. connect to the system in everywhere), accessibility (e.g. 24 hours and 7 days access), durability (e.g. quick recovery from fail) and transparent (e.g. end-users should not know about infrastructure). Our proposal for Ege University's social-constructivisim-based distance learning (SCDL-EGE) system's general schema is shown in Figure 1.

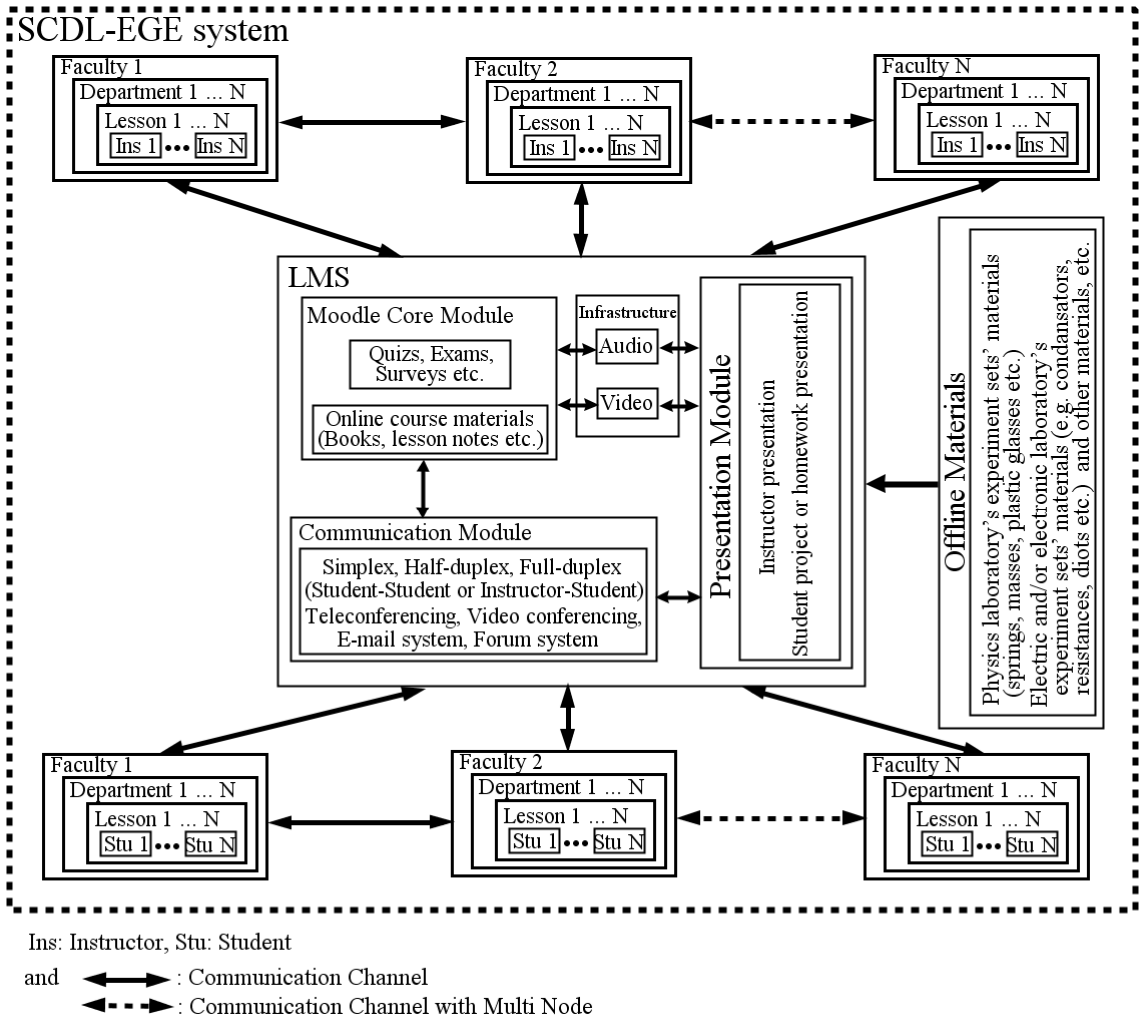

Figure 1. SCDL-EGE system schema.

Ege University has approximately 42900 students. These students are enrolled at 11 faculties, 7 institutions, 6 high school, 8 occupation high schools and 26 research and development centers. In this point of view, our proposal system meets the necessity of Ege University's distance learning area, but it is open to development at this stage.

5.1. Properties of sample class

Properties of a sample class will be review in two categories: Instructor-Student's interaction properties and lesson (course) medium and/or transmission medium's properties. Class size determine quality and kind of interaction at instruction. When class size is pretty much big, student's interaction with each other has difficulties. This is valid for Distance Learning, as well. For thousand student's courses in England the Open University uses computer and video conferencing. In this situation, it occurs a lack of interaction between students.

In a sample class must occur a communication between Instructor and students in a full-duplex and half-duplex style. It must in our system in Moodle LMS and must use necessary tools for this communication. In a student's life (e.g. grown of a child), students learns firstly with touching then with perceiving and later hearing-seeing. In higher education, student's profile is 18-26 (years) age group of man/woman students therefore we must design this system that covers all student groups. When we can look

to learning levels we can see different student levels therefore we must design this system with variable video lesson's (instruction level) streams for every level of students because of new generation video formats (.asf, .mpeg4 etc.) supports interactions. In this way, students determine their lesson and their specific level of instruction. Courses will be medium-independent (platform-independent) or possible to use necessary tools. This independecy must not cause to communication lacks.

Instructor and Student's interaction come to front with virtual platforms as intangible. In this interaction, relation of master-apprentice come less dense. Instructor must be at mode "Omniscient at the corner" (social-constructivist approach) and not to be "The Instructor that knows everything" (objectivist approach) mode. In this sample class, Instruction must separated to chapter and planning these chapters contents. Moodle supports such plans and weekly chart for homeworks-projects etc. therefore student's interest can be keeping alive. There is a secret pedagogical approach for this method. Instructor gives always feedbacks to student hence it require for Student's improvements. An efficient feedback made by Instructor as well as students and it can be half-duplex and/or full-duplex style. Given examples in real life are private open education foundations and Anadolu University's open education faculty's situations [45]. In private foundation's situation, instruction was made at 80% innerclass and 20% online commonly, but Anadolu University made this 80% online (or other Distance Learning techniques) and 20% innerclass or with similar necessary tools. In Turkey, 41% of total Turkey's student's community are Anadolu University's higher education students [46]. A part of this Anadolu University's students are physically impaired persons like blind, deaf people etc. and non-impaired like convicts that they must be a distance learner [45]. Online learning has more workload than face-to-face learning (homework, projects etc.). Our system design's properties are:

- Using our system 80% ratio or over ratio online, 20% ratio or less inner class medium (for only accessary items).
- In meaning of online portal (through Moodle-like LMS system), Instructor-Student and Student-Student interaction will occur half-duplex and full-duplex.
- Instructor and/or Student's live performances can be flow to student through specific video formats.
- Giving course materials to Student to helping student's collaborative projects (e.g. java applets, flash animations or international-journal or conferance papers, student instruction sets etc.) with an easy way (online or offline) can be supported.
- In weekly chart, Moodle LMS's Wiki and other tools (modules) can be used for Instructor and/or Student's collaborative project members that they produce together some works or projects. For this reason can be apply a version-based system with Wiki.

Wiki is an information pages set for Instructor and Students that they can edit pages what them want change easily [47]. When Instructor prepare lesson's notes on Wiki and allow to Student for reaching these notes then students add/edit on these notes. With this method can be in a short time preparing and using and reviewing these notes possible. Through Wiki's version-based system struct can be record students changes and if it wanted the changes can be remove. For each issue and pages linked with related keyword and/or keywords hence automatically reach this issue in website from everywhere. Usage of this system struct will be projects-homeworks smoothly [48].

Questionnaire:

We had prepared a questionnaire for testing our proposal system on Ege Universities' Computer Engineering Department's undergraduate students (namely 80 students), Ege Occupation High School's students (namely 63 students). These students are participants of a distance learning related course of their departments that this course took 16 weeks long for a semester. We had applied totally to 143 students our questionnaire. Our questionnaire has 18 questions which are based on single or multiple choices. We aim with this questionnaire that we measure the state of demand for distance learning for students from Ege University's different faculties. The questions are selected an appropriate form of our paper's aims and flow. An appropriate test in a test enviroment of Ege University shows us the necessity or unnecessity of our proposal distance learning system.

5.2. Possible results in sample class

In our method, Student-Student interaction's improvement occurs in first three weeks. In higher education's one semester is around 16 weeks period hence this time period is enough for efficient learning. In these three weeks; the first week is enrollment week, second week is introduction to lessons and third week is homeworks beginnings week.

In online Instructor-Student interactions, it has some interest lacks of student through distance and medium-independencies. Solution for this problem, introduction must have a standart curriculum and time collaboration for education. In Ege University different student communities took same lesson (course) in different time chart. We must design our system (and method) for this reason which it has a collaborative time chart and same cirriculum for all Ege University's students for same lesson (course). This covers also all different instruction levels, as well. With this aim we construct a model that have pretty much visual objects and interesting materials for students (lessons are enriched by these materials). Student-Student interaction must be for inner faculty as well as inter faculties. For delivery of printed or similar materials can be use MÖTBE center (Ege University's Cultural Center in Campus) therefore material distribution will centric and collaborative project members will be meet in this center. These type of course materials are non-acquirable with online environment (e.g. offline) such as physics laboratory's experiment sets' materials (e.g. springs, masses or plastic glasses etc.), electric and/or electronic laboratory's experiment sets' materials (e.g. condansators, resistances, diots etc.) and other materials etc. These materials' usage details must given on our distance learning system's website in related course web page, as well.

For online courses, with improve laboratories possibilities aim, laboratories will be stay open 24 hours and 7 days in a week in campus for registered students. In inner University laboratories that located "already" in every faculty and/or department become an access point for non-pyhsical (e.g. online) materials of courses (e.g. online journals, books and/or other big sized video and/or sound archives of lessons/research topics etc.) and turn to an study hall or a project preparation hall. This issue is applicable with special permission of Ege University's rectorate. With this permission, students access laboratories with their student identification cards which is enough for laboratory entrance and equipment usage in each one of faculty and/or department. Already, the laboratories are secure with camera control and checked by campus

security center. At the end of these works, Instructor-Student interaction and life-long education will be possible.

Questionnaire Results:

We made a test for possible results of our porposal system. Our questionnaire resulted to a conclusion that Ege University's students are curious and desirous about a distance learning project from Ege University. Our test's participants are 37.06% female and 62.94% male. And participants are divided to different age group: 18 to 22 age, and 22 and more age group. Our participants are 81.12% of first age group, 18.88% of second age group.

They had answered for question about desire of enrollment of a distance learning program that their answers are 67.83% positive, 30.77% negative. The positive answered group think about a distance learning program must take different time durations such as one semester (3 or 4 months), two, three, four or four and more semester, as well. Their duration choices are 28.67%, 21.68%, 0%, 11.89% and 4.20%, respectively. Our participants are 68.53% desirous and 30.07% undesirous for participation for an Ege University's distance learning program. And 1.40% of students have no any idea.

The questions about usage of Moodle and another LMS system was answered by participants that 91.61% of students are never use before a LMS and 72.73% of students are never use before Moodle system. This results shows us an University-wise necessity of information about distance learning. In enrollment and add/drop week, 27.27% of students have problem with Internet system, and 26.57% of them have partially a problem with system. Students had answered a question about an experienced daily transportation problem for arrival to Ege University that 42.66% of them have problems, and 16.08% of them have partially problems. Participants answered the question about computer-assisted learning and replay of lesson from a specific record. Their answers are that 79.02% of students thinks about positive, 20.28% of students looks this issue an unimportant or partially important situation.

In question block of differences between distance learning and face-to-face learning, students gave a decision about face-to-face learning that 46.85% of students think it is necessary, 37,41% of them think it is unnecessary. In this question block, another question is their expectations about Ege University's possible distance learning project. They answered this question that they focused the issue of 7 days and 24 hours access of lesson, course materials from single center (online) and delivery of homeworks/questions and making of quizzes, exams and other evaluations as online, respectively. Their answers are; 75.52%, 38.46%, 31.47%, 24.48%, respectively. And 2.80% of students have their original ideas about these issues. Another question from this block is about daily face-to-face education that students needs what adding to lessons and/or laboratories as corroborative factors. Their answers are; 41.26% for increasing of usage of computers, 25.17% for distribution of course materials from single center, 53.15% for 7 days and 24 hours laboratories access with student identification cards, 41.26% for accessibility and/or visibility of criterias of controls and evaluation of students' homeworks/projects, 41.96% for using of message clipboard, announcement list and forum webpage.

Another question is about accessibilty of course materials and online document on holidays and/or weekends. Students answered this question that 29.37% of them access always with composure, 50.35% of them have access problems on holidays and/or late night, 12.59% of them does not care accessing on holidays or weekends, 8.39% of them does not care access except homework/project or thesis preparation. Students answered the question about information retrieval from some sources such as fellow environment, libraries, journals and/or newspapers, and University's academic staffs that students uses these mediums; 60.14%, 29.37%, 29.37%, 30.77%, respectively. Another question is about how paid their educational costs. They answered this question that 18.18% of them hold a scholarship, 10.49% of them work at a firm, 79.72% of them take support of their family, 3.50% of them take support of their kinsmans. For question about their educational budget is answered by students that 22.38% of them used %15 and less of their total budget, 44.06% of them used between 15% and 25%, 21.68% of them used between 25% and 50%, 9.09% of them used between 50% and 75%, 1.40% of them used between 75% and more. For question about their daily internet usage is answered by students that 13.29% of them used %15 and less of their work time, 11.89% of them used between 15% and 25%, 25.87% of them used between 25% and 50%, 29.37% of them used between 50% and 75%, 18.88% of them used between 75% and more.

In meeting frequency question, students answered this question that 32.87% of them meet their friends before every exams, 25.17% of them work alone, 33.57% of them ask only view of their friend, but not come together all of them, 12.59% of them come together all of them in specific intervals and work according to a work plan. Participants (e.g. students) repeats after a lesson in daily or weekly period alone in duration of zero to 2 hours at day, 2 or more hours at day, 2 or less hours at week, 2 or more hours at week, and no repeat. These answers distributed in order to 19.58%, 4.90%, 22.38%, 19.58%, 32.17%, respectively.

5.3. Comparison with other studies

In Turkey, some Universities works as partially on similar methods like our method that above explaning. For example, in Kocaeli University's related website, Distance Learning with Moodle LMS-based system applied to University's some faculties' theoric and applied courses (and laboratories) [47]. In Kocaeli University's website exist a statement that "Kocaeli University Learning Support System (KOUEDS) used in Kocaeli University's faculties' courses which a support tool for these courses. This tool supports online homeworks, exams, questionnaires, lesson's notes and communication platform for students about their lessons. And will be broading to total of Kocaeli University. Distance Learning Research and Application Center (UZEM)". In Figure 2 shown as a web page from Kocaeli University's UZEM website.

Figure 2. Kocaeli University's UZEM Moodle LMS's website.

Currently, there are approximately 53000 students enrolled at the Kocaeli University and it has 12 faculties, 7 high schools, 3 institutions, 19 occupation high schools. In Mersin University, there are approximately 25700 students enrolled at Mersin University's programs. These programs are given in the 12 faculties, 7 high schools, 3 institutions, 12 occupation high schools. The Sakarya University has approximately 45600 students. These students are enrolled at totally 138 programs which are given in 8 faculties, 12 occupation high schools etc. In other similar studies, (which not using the Moodle LMS) like Mersin University's [49], Mersin Occupation High School offers a service with developed by Mersin University that a portal meaning website for Distance Learning. Sakarya University [50], offers a subsystem and service for Distance Learning Center (Internet-Aided Education) for Adapazari Occupation High School and E-MBA, certificate programs, campus programs and European Computer Driving License (ECDL) Test Center lessons. In Figure 3 is shown as a web page from Mersin University's Distance Learning portal and In Figure 4 is shown as a web page from Sakarya University's website belongs to their Distance Learning Center.

Figure 3. Mersin University's Distance Learning System's website.

Figure 4. Sakarya University's Distance Learning System's website.

Currently, there are approximately 12000 students enrolled at the Bilkent University; one-fourth of the student body is on scholarship. Bilkent University has 38 undergraduate and 27 graduate programs. Over 2000 courses are given in the University's nine faculties, two applied schools and three vocational schools. There are more than 1000 faculty members; international faculty members from around 40 countries comprise one-third of this number. There are over 4000 computers in laboratories around the campus that are available 24 hours a day, 365 days a year.

In Figure 5 is shown as a web page from Bilkent University's Bilkent Educational Technology Support Unit and Moodle LMS system [51]. This system supports many subsystems and many options than other Universities' similar systems. Bilkent University said in their Bilkent Educational Technology Support Unit website for necessity of Moodle with a statement: "*Bilkent University uses Moodle as a Course Management System (CMS) in order to;*

- *Deliver our courses electronically through easily accessible documents, forums and assignments,*
- *Enhance out of class communication and interaction,*
- *Improve our teaching by integrating new instructional technologies* ".

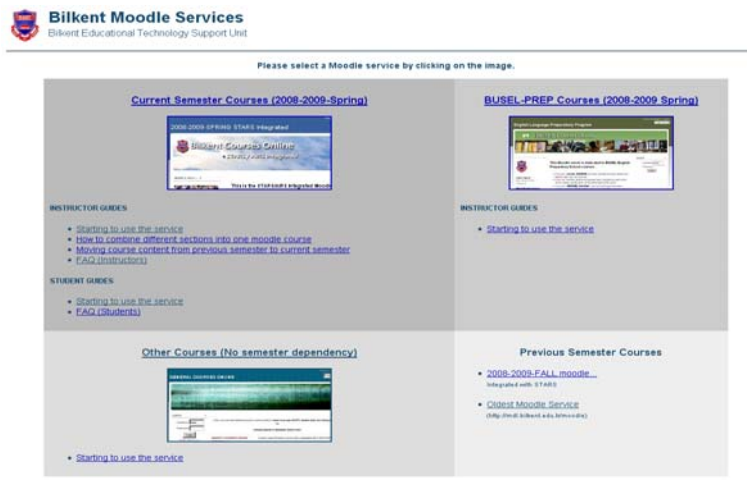

Figure 5. Bilkent University's Moodle LMS.

Betwen all of these systems and our method-based system's main differences are;

- Existed in our developed method Instructor's and/or Student's live performances in interactivity-based video formats, but not exist in other systems like these formats.

- Thinking about in our developing system has a student's daily improvements which shown in weekly chart and has a version-based system which viewable by Instructor and/or Student's collaborative project's other members and followable with Moodle LMS's Wiki tool. With this version-based system, updates will be made daily and all participants knows about last document what covers. These issues is not exist fully in other similar studies (on non-Moodle LMS-based Universities' websites it is not exist, e.g. Mersin University and Sakarya Universty). This facility exist only on Wiki.

- In our method, for accessing course materials which are non-acquirable with online environment (e.g. offline) such as physics laboratory's experiment sets' materials (e.g. springs, masses or plastic glasses etc.), electric and/or electronic laboratory's experiment sets' materials (e.g. condansators, resistances, diots etc.) and other materials (these examples are changes for every faculty and/or department). We must develop a standart for distribution of physical course materials as told above (at one point like Ege University's Campus Cultural Center-MÖTBE) is not exist in other studies of other Universities. Accessing to non-physical materials (e.g. online) during 24 hours and 7 days in inner University laboratories that located "already" in every faculty and/or department. This issue is applicable with special permission of Ege University's rectorate. With this permission, students access laboratories with their student identification cards which is enough for laboratory entrance and equipment usage in each one of faculty and/or department. Already, the laboratories are secure with camera control and checked by campus security center. A similar access feature of laboratories supported by currently only by Bilkent University is different from other universities, as well.

6. Results

Developing a method that based on effective Distance Learning system is pretty much affordable work. When method's design is so difficult, application is more difficult. There is still no any similar (integrated) social-constructivist approach-based LMS system for Ege University. Developing this social-constructivist model is relatively difficult for Ege University, but is not impossible.

In our study, we reviewed firstly other Moodle-based and non-Moodle-based Universities' systems and then hybrid approach idea look to us more feasible for our situation. With this idea and aim, we must design a method/system that will be improve Instructor-Student and Student-Student interactions.

References

[1]. MEB, Milli Eğitim Bakanlığı, **Yaygın Yüksek Öğretim Kurumu (YAYKUR)**, Ankara: Mesleki ve Teknik Açıköğretim Okulu Matbaası, (1982).
[2]. Alkan, C., Uzaktan Eğitimin Tarihsel Gelişimi, **Türkiye 1. Uluslararası Uzaktan Eğitim Sempozyumu** 12-15 Kasım 1996, Bildiriler, Ankara: Uzaktan Eğitim Vakfı Yayınları, (1996).
[3]. MEB, Milli Eğitim Bakanlığı Eğitim Teknolojileri Genel Müdürlüğü – Website (in Turkish language), (2009), http://egitek.meb.gov.tr/ , (21.04.2009).
[4]. Moore, M. G., Toward a Theory of Independent Learning and Teaching, **Journal of Higher Education**, 44, 661-679, (1990).
[5]. Harran University: Interactive Distance Learning with Istanbul University – Website (in Turkish language), http://www.harran.edu.tr/harran/interactive.htm, (21.04.2009).
[6]. Cowan, J., The Advantages and Disadvantages of Distance Education, **Distance Education for Language Teachers** (Editors: R. Howard and Ian McGrath), Clevedon: Multilingual Matters Ltd., (1995).
[7]. Kaya, Z., **Uzaktan Eğitimde Ders Kitapları**, Ankara: Gazi Üniversitesi Endüstriyel Sanatlar Eğitim Fakültesi Baskı Atölyesi, (1996).
[8]. Johnson, S.D., Suriya, C., Won Yoon, S., Berrett, J.V., La Fleur, J., Team development and group processes of virtual learning teams, **Computers and Education**, 39 (4), 379–393, (2002).
[9]. Lehtinen, E., Hakkarainen, K., Lipponen, L., Rahikainen, M., Muukkonen, H., Computer Supported Collaborative Learning: A review of research and development, **The J.H.G.I Giesbers Reports on Education**, 10. Department of Educational Sciences, University of Nijmegen, (1999).
[10]. Marshall, E. M., The collaborative workplace, **Management Review**, (June) 24, 13–17, (1995).
[11]. Schrage, M., **Shared Minds**, Random House, New York, (1990).
[12]. Gros, B., Instructional design for computer-supported collaborative learning in primary and secondary schools, **Computers in Human Behavior**, 17, 439–451, (2001).
[13]. Wilkinson, R., **Unhealthy Societies**, The Afflictions of Inequality. Routledge, London, (1996).
[14]. Bauman, Z., **Globalization**, The Human Consequences. Polity Press, Cambridge, (1998).
[15]. Putnam, R., **Bowling Alone: The Collapse and Revival of American Community**, Simon and Schuster, New York, (2000).
[16]. Coleman, J.S., **Fundations of Social Theory**, Harvard University Press, Cambridge Mass, (1990).
[17]. Orford, J., **Community Psychology: Theory and practice**, Wiley, Chichester, (1992).
[18]. Edwards, B., Foley, W.M., Diani, M., Tufts, M., **Beyond Tocqueville, Civil Society and Social Capital Debate in Comparative Perspective**, University Press of New England, Hanover, (2001).
[19]. Francescato, D., Tomai, M., Mebane, M., **Psicologia di Comunita per la Scuola, l'Orientamento e la Formazione, Esperienze Faccia a Faccia e Online**, Bologna: Il Mulino Publication, Italy, (2004).
[20]. Bradley, C., Oliver, M., The evolution of pedagogic models for work-based learning within a virtual university, **Computers and Education,** 38, 37–52, (2002).

[21]. Crook, C., **Computer and the Collaborative Experience in Learning**, Routledge, London, (1994).
[22]. Johnson, D.W., Johnson, R.T., **Leading the Cooperative School**, 2nd ed. Interaction Book Company, Edin, MN, (1994).
[23]. Journal of Computer Assisted Learning - Website (2009), http://www.wiley.com/bw/aims.asp?ref=0266-4909&site=1, (21.04.2009).
[24]. Sensation and perception psychology - Wikipedia.org Website (2009), http://en.wikipedia.org/wiki/Sensation_and_perception_psychology, (21.04.2009).
[25]. Wagner, E. D., In support of a functional definition of interaction, **The American Journal of Distance Education**, 8(2), 6−26, (1994).
[26]. Muirhead, B., Juwah, C., Interactivity in computer-mediated college and university education: A recent review of the literature, **Educational Technology & Society**, 7(1), 12−20, (2004).
[27]. Vrasidas, C., McIsaac, M. S., Factors influencing interaction in an online course, **American Journal of Distance Education**, 13(3), 22−36, (1999).
[28]. Hirumi, A., The design and sequencing of E-learning interactions: A grounded approach, **International Journal on E-learning**, 1(1), 19−27, (2002).
[29]. Deubel, P., An investigation of behaviorist and cognitive approaches to instructional multimedia design, **Journal of Educational Multimedia and Hypermedia**, 12(1), 63−90, (2003).
[30]. Hannafin, M. J., Interaction strategies and emerging instructional technologies: Psychological perspectives, **Canadian Journal of Educational Communication**, 18(3), 167−179, (1989).
[31]. Vrasidas, C., McIsaac, M. S., Factors influencing interaction in an online course, **American Journal of Distance Education**, 13(3), 22−36, (1999).
[32]. Skinner, B. F., The science of learning and the art of teaching, **Harvard Educational Review**, 24(2), 86−97, (1954).
[33]. Burton, J. K., Moore, D. M., Magliaro, S. G., **Behaviorism and instructional technology**, In D. H. Jonassen (Ed.), Handbook of research on educational communications and technology (pp. 3−36), 2nd ed. Mahwah, NJ: Lawrence Erlbaum Associates, (2004).
[34]. Banathy, B. H., Jenlink, P. M., **Systems inquiry and its application in education**, In D. H. Jonassen (Ed.), Handbook of research on educational communications and technology (pp. 37−57), 2nd ed. Mahwah, NJ: Lawrence Erlbaum Associates, (2004).
[35]. Idaho State University's Instructional Technology Resource Center (ITRC), (2002-2009), http://www.isu.edu/itrc/, (21.04.2009).
[36]. Jordan, T. J., Self-concepts, motivation, and academic achievement of black adolescents, **Journal of Educational Psychology**, 73, 509-517, (1981).
[37]. Senemoğlu, N., **Gelişim Öğrenme ve Öğretim**, Gazi Kitabevi, Ankara, (2005).
[38]. Stage, F. K., Muller, P. A., Kinzie, J., ve Simmons, A., Creating learning centered classrooms: What does learning theory have to say?, **ASHEERIC Higher Education Reports**, vol. 26(4). Washington, DC: The George Washington University, Graduate School of Education and Human Development, (1998).
[39] Bednar, A. K., Cunningham, D., Duffy, T. M., ve Perry, J. D., **Theory into practice: How do we link?**, In T. M. Duffy, & D. H. Jonassen (Eds.), Constructivism and the Technology of Instruction (pp. 17-34). Hillsdale, NJ: Lawrence Erlbaum Associates Inc., (1992).

[40] Vrasidas, C., Constructivism versus objectivism: Implications for interaction, course design, and evaluation in distance education, **International Journal of Educational Telecommunications**, 6(4), 339-362, (2000).
[41]. Moodle – Course Management System Website, (2009), http://www.moodle.org, (21.04.2009).
[42]. Duran, N., Öğrenme Yönetim Sistemleri İçin Scorm Uyumlu Bir Başvuru Modeli Geliştirilmesi, Yüksek Lisans Tezi, Ege Üniversitesi, Fen Bilimleri Enstitüsü, (2007).
[43]. A-tutor - Open Source Web-based Learning Content Management System (LCMS) Website (2009), http://www.atutor.ca/, (21.04.2009).
[44]. Videolectures.net, Exchange Ideas-Share Knowledge - Website, (2009), http://videolectures.net, (21.04.2009).
[45]. Anadolu University: E-Learning services at the Anadolu University – Distance Education System – Website (in Turkish language), (2009), http://www.anadolu.edu.tr/aos/aos_tanitim/e-ogrenme_hiz.aspx, (21.04.2009),
[46]. Anadolu University: E-Learning services, a news webpage in e-gazete of Anadolu University which about of Anadolu University's higher education students' amount (in Turkish language): http://e-gazete.anadolu.edu.tr/ayrinti.php?no=7610# , (21.04.2009).
[47]. Kocaeli University: Learning Support System (KOUEDS) - Distance Learning Research and Application Center (UZEM) – Website (in Turkish language), (2009), http://moodle.kou.edu.tr/, (21.04.2009).
[48]. İnner, B., Öğrenme Yönetim Sisteminin (Moodle) Örgün Öğretim Laboratuvar Uygulamalarında Kullanılması, **Ulusal Teknik Eğitim, Mühendislik ve Eğitim Bilimleri Genç Araştırmacılar Sempozyumu**, UMES 2007, 2, 917, (2007).
[49]. Mersin University: Mersin Occupation High School Distance Learning – Website (in Turkish language), (2009), http://uzak.mersin.edu.tr, (21.04.2009).
[50]. Sakarya University: Distance Learning Center (Internet-Aided Education) for Adapazari Occupation High School – Website (in Turkish language), (2009), http://www.ido.sakarya.edu.tr/, (21.04.2009).
[51]. Bilkent University: Bilkent Educational Technology Support Unit, Bilkent University's Online Courses, Moodle CMS Services System – Website, (2009), http://moodle.bilkent.edu.tr/, http://mdl.bilkent.edu.tr/, (21.04.2009).