MOVING THE WEBQUEST PROCESS FROM STATIC TO DYNAMIC:
PRESERVICE TEACHERS' EXPERIENCE WITH THE DYNAMIC
WEBQUEST ENVIRONMENT

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ABSTRACT

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WebQuest is one of the popular technology integration strategies in school environment. This study is conducted to overcome existing problems for both teachers and students in higher education by bringing dynamism to existing approach. Therefore, the purpose of this study is to design, develop, implement the new approach of the WebQuest, and assess the experiences of the participants that they encounter in the dynamic WebQuest environment.

The participants of this study were the students of two undergraduate courses offered by the Secondary Science and Math Education Department (SSME) and

Computer Education and Instructional Technology Department (CEIT) of a private university. Seventy undergraduate students participated in this study.

This study employed both qualitative and quantitative measures in order to develop explanatory thoughts about the WebQuest site, projects and perceptions towards the process and the project.

The findings of this study showed that participants favored the WebQuest site and the project, which is dynamically created. Furthermore, they offered valuable suggestions to improve the effectiveness of the system.

Keywords: WebQuest, project-based learning, technology integration

ÖZ

WEB MACERASI SÜRECİNİN STATİKTEN DİNAMİĞE DÖNÜŞÜMÜ: ÖĞRETMEN ADAYLARININ DİNAMİK WEB MACERASI ORTAMINDAKİ DENEYİMLERİ

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Web Macerası, okul ortamında popüler olan teknoloji entegrasyonu stratejilerinden biridir. Bu çalışma, var olan yaklaşıma dinamizm getirerek öğretmenler ve öğrenciler için oluşan problemlerin üstesinden gelmek için düzenlenmiştir. Bu nedenle, bu çalışmanın amacı, Web Macerasının yeni yaklaşımını tasarlamak, geliştirmek, uygulamak ve dinamik Web Maceraları ortamındaki katılımcıların karşılaştıkları deneyimlerini değerlendirmektir.

Bu çalışmanın örneklemi, özel bir üniversitenin Orta Öğretim Fen ve Matematik Alanları Eğitimi ve Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü bünyesinde verilen, iki lisans dersinin öğrencileridir. Bu çalışmaya 70 öğrenci katılmıştır.

Bu çalışmada, Web Macerası projeleri, Web sitesi hakkında düşünceler ile sürece ve projelere yönelik algılar hakkında daha açıklayıcı bilgi geliştirmek amacıyla nitel ve nicel araştırma teknikleri uygulanmıştır.

Bulgular, öğrencilerin Web Macerası sitesini ve dinamik olarak oluşturulan projelerini beğendiklerini göstermiştir. Ayrıca, sistemin etkililiğini geliştirmek için değerli önerilerde bulunmuşlardır.

Anahtar Kelimeler: Web Macerası, proje-tabanlı öğrenme, teknoloji entegrasyonu

To my family and a special person

ACKNOWLEDGEMENTS

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CHAPTER 1

INTRODUCTION

Technology is constantly changing and outspreading to new fields of interests by offering innovative resources. These innovative resources are being integrated into teaching–learning process somehow. However, educators and institutions are trying to find an effective way to create meaningful learning environments with the help of these resources. Numerous useful, creative ideas about the integration of technology into curriculum and classroom environment have been proposed by curriculum developers, educators, and instructional technologists. In addition, educators plan instructional activities by using instructional methods and materials to achieve the expected or planned learning outcomes. On the other hand, many learning theories and models are being adapted to learning environments framed with technologies to improve the quality of the teaching-learning process as well as the learning outcomes. Moreover, the roles of educators have shifted from teaching to guiding learners with the help of technology-based environments.

The terms such as computer-based, Web-based, and Internet-based constitute some examples to the model to be used among the technology-based teaching-learning methods. All have the same and most common aim of improving the quality of instruction through the use of technologies. When these technologies are used with the instructional methods, such as active learning strategies in a manner of motivating learners to engage in the teaching-learning environment, learners can construct their own learning. As Pollard and Pollard (2005) mentioned, "With increased access to computers and the Internet, researchers extended their efforts to investigate the role of technology in the educational setting, including its impact on teachers and the learning process." (p.145).

Technology is in fact more than the hardware that provides access to a variety of information and human resources. Sapone and Hyatt (2005) explained the importance of the technology in the classroom as, "Teachers must prepare to provide and design the "right kind" of assignments that utilize technology" (p.155). One of the most common and great source of information, Internet, connecting people around the world, and can be utilized as a supportive resource in a learning environment. Because, there are various types of information growing day by day on the Internet, "Teachers validate the information they find on the Internet" (Sapone & Hyatt, 2005, p.155).

If Internet and its resources are used effectively to engage learners in meaningful learning, they have the potential to transform the teaching-learning process from traditional, teacher-directed instruction to a powerful, student-led, inquiry-based learning. (Jonassen et al., 2003). The educational value of Internet-based activities varies widely and promotes minimal learning activities that require students to seek, analyze, evaluate, and apply information in the process of transforming that information into knowledge through inquiry. (Jonassen et al., 2003).

Cramer (2007) said, "One way to engage students in authentic instruction and assessment is through WebQuests, which are inquiry-oriented activities that use Web resources to solve a problem" (p.129). Moreover, Jonassen and his colleagues (2003) added that "For teachers just beginning to use the Internet as a learning tool, WebQuest may be good starting place because they provide a clearly defined structure and their design and use is well supported" (p.45). Additionally, the father of the WebQuest, Bernie Dodge (1996) defined the term WebQuest as "… a technique for engaging students in active learning which uses the web and other resources as they strive to understand a topic." A well-designed WebQuest use Internet effectively to promote instructional practices (March, 2004).

The biggest improvement in education is the use of computer, Web, and Internet technologies. Using all in one is a powerful step for all aspects of teaching-learning

progress. Since these are the latest technologies of today, application of these in courses will not only improve the quality of the instruction but also, engage learners in technology-based meaningful environments.

1.1   Background of the Problem

Innovation in the development of technology has introduced different concepts for the teaching-learning process other than classrooms and homes. Many terms like Web-based instruction, authentic assessment, meaningful learning, collaborative project, and active learning strategies have gained popularity with these rapid developments in the 21st century. Delivered on the Internet, Web-based instruction has recently gained more attention and reputation as a method for both teaching and learning in educational institutions.

Web based instruction has been used for many years as blended learning, distance learning, e-learning, and also used as a support to traditional classroom instruction. Among these various models, WebQuests were introduced by Bernie Dodge. Since then many applications have been completed with success, and many research studies have been conducted to find out the effectiveness of this method. This method can be used both as a teaching and as an evaluation method by teachers. Encouraging students to create WebQuests is also another issue, which makes learners active participants in their own learning process.

Although used for many years by many teachers and educators, the static structure of the method has remained the same. By the help of various technologies, this study aimed to "bring dynamism to WebQuests" (Gülbahar & Madran, 2006).

1.2   Purpose of the Study

WebQuest is one of the popular technology integration strategies in school environment. Any teacher who does not have any technical information about

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designing, creating and managing Web sites, may fail to create WebQuest activities and may give up if they have great ideas about inquiry-based, student-led, Web-based activities. This study is conducted in order to fix that kind of technical issues about constructing WebQuest pages, to make creations of the WebQuest dynamic, to update steps of WebQuest projects easily, and to evaluate students' files uploaded to WebQuest projects. Therefore, the purpose of this study is to design, develop, implement the new approach of the WebQuest, and assess the experiences of the participants that they encounter in the dynamic WebQuest environment.

1.3 Significance of the Study

Lipscomb (2003) explained, "Rather than engaging with the new technology in dynamic classroom settings, students continue to learn in traditional ways and rarely use computers for anything more than word processing and simple research. Technology can greatly benefit teachers hoping to supplement their classroom curriculum and make it more meaningful for their students" (p.152). Moreover, teachers can support effective technology usage in the meaningful learning environment by implementing some instructional methods requiring use of technology.

As Perkins and McKnight (2005) stated, "Many teachers do not know how to create Web pages" although this is necessary for using WebQuest in classroom. Moreover, many teachers have limited skills in Web-page construction, even though there are available templates in the Web environment (Vidoni & Maddux, 2002). Since, developing WebQuests also takes time and the amount depends on the teachers' skills (Perkins & McKnight, 2005), this research study is aimed to help teachers to create and use their WebQuest easily in their courses.

 As Cramer (2007) mentioned "Teaching and learning in a twenty-first-century context involves making content relevant to life outside of school, a key concept in authentic instruction and assessment." (p.129), teachers' use of instructional

strategies such as problem-based, project-based, and inquiry-based strategies cannot be avoided. Therefore, dynamic WebQuest approach can be used to achieve that aim.

Another important point of WebQuest is engaging students in active, constructive, intentional, authentic, and cooperative learning (Jonassen et al., 2003). The dynamic environment of the WebQuest can be seen as authentic learning environment and may motivate learners to engage with that process.

Above-mentioned points can lead to effective integration of technology, which is the main goal of use for educational purposes. Thus, the dynamic WebQuest will not only help teachers to create WebQuests easily and use various authentic strategies, but also may help students to improve their various skills and affect their academic achievement.

CHAPTER 2

REVIEW OF THE LITERATURE

Many research studies are conducted to reveal the impact of technology on many instances, since the use of technology for educational purposes. Most of those research studies have showed that technology has generally a positive impact, although many variables like instructional environments, content, teaching methods, or instructional technologies have been changed in these studies. For the current research study, computer, Web, and Internet technologies, together with project-based learning were used as a support to traditional classroom. Thus, firstly presented in the review of literature were the findings of research studies about technology integration and the impact of technology and different teaching methods. Afterwards, detailed information about WebQuest is explained with the support of literature. This part ends with a new approach to WebQuest method, which forms the basis for this study.

2.1   Technology Integration

The definition of the term "technology" is synthesized by Gentry (1995) through the major definitions of the past to define technology that is more current. Technology is "systemic and systematic application of behavior and physical sciences concepts and other knowledge to the solution of the problems" (p. 7). He added "systemic application" notion to the definition because of interaction of all the things in the system that needs to be considered while construction of the system. "Systematic application" is included because many significant variables, such as learning, can easily be controlled or leaved uncontrolled in a system. He mentioned "application" as the translation and implementation of knowledge into a system to solve a problem.

The technology used in instruction can be named as instructional technology and Seels and Richey (1994) defined this notion as "the theory and practice of design, development, utilization, management and evaluation of processes and resources for learning" (p. 9). The definition of the technology also covers a part of definition of the instructional technology as Gentry (1995) defined this term as "the systemic and systematic application of strategies and techniques derived from behavior and physical sciences concept and other knowledge to the solution of instructional problems" (p. 7). Moreover, the activities performed by educators and designers in the instructional technologies has changed, Reiser (2002) also changed this notion to reflect the changing nature of the field according to its development and defined as:

> "The field of instructional design and technology encompasses the analysis of learning and performance problems, and the design, development, implementation, evaluation and management of instructional and non-instructional processes and resources intended to improve learning and performance in a variety of settings, particularly educational institutions and the workplace" (p. 12).

Instructional technology can be seen as a subset of educational technology that may combine of instructional, learning, development and managerial technologies within in the same system. The narrower part of educational technology, instructional technology, can include design, delivery, and evaluation of the message that is implemented in the teaching-learning process (Gentry, 1995). Moreover, Zhao and his colleagues (2002) summarized that the interaction between education and technology "is the conditions under which technology can effectively used in classrooms to improve student learning" (p. 483). They added, "regardless of the claimed educational benefits, technology must used to have an impact on learning".

The schools, universities, and other educational institutions may benefit from educational technology if they provide some necessities for teachers and students. For example, students and teachers can have access to hardware, software, and network connections, meaning accessibility to technology concern. Although availability of technology does not mean that technology is integrated, it is the main

step of the process. Regarding to this issue, AL-Bataineh and Brooks (2003) stated that "it is worthy to note that perhaps the greatest challenge in the current era of technology use is moving beyond simply increasing availability of technology" (p. 477). Another concern is that having necessary hardware to connect Internet does not mean that schools can access Internet, meaning connectivity to Internet technology concern. As next concern, using technology for instructional purposes may require teachers to perform different skills while supporting the computer-based or Internet-based education. Zhao and his colleagues (2002) explained, "One of most important ingredients to successful integration of innovative uses of technology in schools is the teacher" (p. 495). Additionally, Hilton (2005) stated, "While teachers may have computers at home, using computer for instruction often requires different skills, and many educators are not trained in these skills" (p. 216). Regarding to training concern, Fatemi (1999, as cited in Hilton, 2005) explained that a teacher-training program about "integrating technology into the curriculum" was more helpful than a program about "basic technology skills". Moreover, it is essential that these training programs shape the teachers' use of technology in the classroom environment (Hilton, 2005).

Teachers' pedagogical beliefs interacted with the technology (Zhao et al., 2002), differences in their teaching domains (ChanLin et al, 2006) and attitude towards computer or Internet technologies affected the likelihood of successful technology integration. Moreover, ChanLin and his colleagues (2006) stated, "Teachers' beliefs about teaching, their experience in using technology and interest in trying new things affected their willingness for technology integration" (p. 62). Not all technologies may deliver specific content and reflect all aspects of the teaching approaches. Teachers must be aware of how specific technologies might support their own instructional methods and their goals while trying to integrate technology in teaching (Zhao et al., 2002).

AL-Bataineh and Brooks (2003) summarized the integration of the technology to be effective in the classroom environment according the three phases of technology evolution:

- "Teachers must receive adequate ongoing training,
- Technology use must be matched to the curriculum's philosophy and theory of learning, and
- Adequate numbers of computers must be conveniently located within the classroom." (p. 479).

Integrating technology into classroom environment helps teachers use technology as media, medium, or method in their teaching and learning process. The researchers defined some steps of the integration of technology into school and classroom environment. A ten year of Apple Classrooms of Tomorrow (ACOT) study was conducted to determine how the routine use of technology by teachers and students might change teaching and learning. It was observed that teacher use of technology evolved through five stages: entry, adoption, adaptation, appropriation, and invention (Sandholtz, Ringstaff & Dwyer, 1992). In the entry step, teachers had little or no experience with technology; demonstrated little interest in changing their instruction and used text-based instructional technology. Nevertheless, they learned the basics of using the new technology. In next step, adoption, teachers adopted the new electronic technology to support traditional instruction. In adaptation step, teachers integrated new technology to the classroom practice and allowed students to use word processors, simulations, and graphics and computer-assisted instruction. In appropriation step, team teaching, interdisciplinary project-based instruction, and individually paced instruction became more common. In the last step, students were active, creative participants of the learning process because teachers discovered new uses of technology tools that combine multiple technologies. While passing through the stages, students became learners that are more active in the learning process, and the teacher provided support or assistance through the teaching process. Moreover, Zhao and his colleagues (2002) founded from their study that "when a teacher's

pedagogical approach to teaching was consistent with the technology she or he chose to use; the efforts to use technology were more likely to yield positive results" (p. 492).

Training teachers use technology in their learning environment is complex process. Regarding to this concern, Mills and Tincher (2003) maintained that "to prepare teachers to be technology integrators is a process that develops in stages in much the same way a person develops expertise" (p. 384). Moreover, AL-Bataineh and Brooks (2003) stated that "even as technology use and application advances at an almost logarithmic pace, many of the issues related to technology use remain remarkable constant. These include properly trained staff, adequate equipment, ongoing funding, and successful integration of technology" (p. 473).

2.2 About the Impact of Technology on Teaching-Learning Process

The major improvement in education is the use of computer, Web, and Internet technologies to create meaningful learning environments for students. As Jonassen and his colleagues (2003) mentioned about meaningful learning that: "Meaningful learning requires who are actively engage in a meaningful task (not just pressing the spacebar to continue) in which they manipulate objects and parameters of the environment they are working in and observing the results of their manipulations" (p. 7). Active participation also can be provided with group work via use of technologies. About the benefits of technology Lacina (2007) said, "Students will learn to work in a collaborative environment, learning information that is relevant to units of study within a particular content area. Students become responsible for their own learning-and they use technology to complete a task." (p. 252).

Technology-using educators accept that their goal is to support meaningful learning, and then they should use technologies to engage students in active, constructive,

intentional, authentic, and cooperative learning (Jonassen et al., 2003). Active learning strategies, such as inquiry-based, project-based, problem-based approaches, complex, real-world problems, motivate students to research concepts, and principles (Lowry & Turner, 2005). In the sight of meaningful, active learning, students may construct their own learning from communities of other students in a cooperative way. Lightner, Bober and Willi (2007) also mentioned "…educators are gradually moving away from talk-and-chalk lectures to project-based learning, real-world problem solving, and team collaboration" (p.5).

Complex problems that do not have "black-and-white answers" require students to use their higher-order thinking skills of analysis, synthesis, and evaluation. Moreover, when students are placed in the role of different person of having different perspectives within a situation that reflects the real world, students are in the scope of active, constructive, intentional, authentic, and cooperative learning (Lowry & Turner, 2005; Jonassen et al., 2003). Cramer (2007) pointed out, "This type of activity requires students to explore an issue from multiple perspectives, determine and support a course of action, and share their findings with others outside of school. This is twenty-first-century learning using twenty-first-century skills" (p.129). Students not only adopt a role and view a situation from the viewpoint of their role, but also they present arguments, defend their viewpoints in written and verbal form, persuade the audience by interacting with himself or herself and with a team that develops their social skills (Monday & Baker, 2005).

The problem offered students must be open-ended and real world, require working in groups, and require exploring a variety of different perspectives to come up with a solution. Besides, Cramer (2007), indicated that "students should not be able to just copy-paste information to arrive at a solution, they must transform information into something new" (p. 129). Moreover, Jonassen and his colleagues (2003) added that "when learning experiences are situated in real-world contexts, as is the case in problem-based or case-based scenarios, learning, retention and transfer to other situations are enhanced" (p. 53).

In order to engage students in authentic, meaningful, and active learning, and use Internet as a learning tool, WebQuest may be a good starting point (Cramer, 2007; Jonassen et al., 2003). As Lacina (2007) reported that WebQuests are a wonderful instructional method through which teacher can build technology-rich activities while fostering cooperative learning" (p. 251).

2.3   What is a WebQuest?

The founder of WebQuest concept, Bernie Dodge (1995) defines this term that WebQuest is an inquiry-oriented activity in which learners interact with resources on the Internet.

WebQuest, as defined by Tom March (2003),

> "Is a scaffolded learning structure that uses links to essential resources on the World Wide Web and an authentic task to motivate students' investigation of a central, open-ended question, development of individual expertise and participation in a final group process that attempts to transform newly acquired information into a more sophisticated understanding. The best WebQuests do this in a way that inspires students to see richer thematic relationships, facilitate a contribution to the real world of learning, and reflect on their own meta cognitive processes."

Moreover, Tom March (2002) explained that a stereotypical WebQuest sees a team of students accessing Web sites in order to produce a technology-enhanced group product. Zheng and his colleagues (2005) stated, "Currently, WebQuests are used as electronic sheets, problem-solving tools, and URL resources" (p. 43). If WebQuests are used as both electronic sheets and URL resources, learning can be just what is found on the Web. On the other hand, if WebQuests are used as problem solving tools, then students will analyze, synthesize, and evaluate information and construct knowledge that is most meaningful to them (Zheng et al., 2005). From a different point of view, while students are trying to perform such abilities, the role of

instructor is shifted to guide from authority figure standing in front of the classroom (Kundu & Bain, 2006).

In general, WebQuests are structured, Web-supported activities that want learners to explore the given Web resources or printed materials to transform information into different formats or new forms. WebQuests have at least two levels that should be distinguished from one another (Dodge, 1995). A short-term WebQuest is designed to be completed in one to three class periods that have aim of knowledge acquisition and integration. A long-term WebQuest is designed to be completed in one week or a month in a classroom setting that has aim of extending and refining knowledge (Dodge, 1995).

2.4 Teaching Methods used by WebQuests

The project-based learning, an active learning strategy, is an approach that learners focus on developing a product or creation by learning. The project may or may not be student-centered, problem-based, or inquiry-based (Lamb, 2001; Lowry & Turner, 2005). In this approach, students have open-ended assignments providing them with a degree of choice over considerable period of time (Lowry & Turner, 2005). The Project-based learning (PBL) is a constructivist approach to teaching. Regarding to this issue, Gubacs (2004) explained, "Conducting the actual PBL process involves identifying specific tasks and responsibilities so that the team members know their roles and what is expected of them." (p. 36).

The problem-based learning, another active learning strategy, is an approach that learners focus on the process of solving problem and acquiring knowledge (Lamb, 2001; Lowry & Turner, 2005). In this approach, complex, real-world problems or cases are used to motivate students to identify and research concepts and principles they need to know in order to progress through the problems (Lowry & Turner, 2005; Cramer, 2007). As Teplitski and McMahon (2006) mentioned, "problem-based learning creates a context for students to generate their own questions under the

instructor's guidance and provides a framework for collaborative group learning" (p.210).

WebQuest, which makes students access the Web to complete a task or solve a problem, elicits higher order thinking, rather than simple information searching and recall. These tasks should involve problem solving, judgment, synthesis, and analysis of information. Perkins and McKnight (2005) explained one of the benefits as: "In the process of problem solving, students learn skills in an interactive, involved manner rather than in isolation" (p.124). Moreover, Abu-Elwan (2005) added that in order to develop students' skills, WebQuest provide authentic, technology-rich environment for problem solving.

Another active learning strategy, inquiry-based learning, is a student-centered approach that learners focus on questioning, critical thinking, and problem solving. It is associated with the idea "involve me and I understand." (Lamb, 2001; Lowry & Turner, 2005). Moreover, Lowry and Turner (2005) added, "this approach is more focused on using and learning content as a means to develop information-processing and problem-solving skills" (p.190).

The main goal of the WebQuests, for inquiry-based learning, is to represent a higher-order use of technology, which requires students to exercise information seeking, analyzing, and synthesizing strategies. By this way, information-seeking strategies "represent higher levels of cognition than simple knowledge acquisition." (MacGregor & Lou, 2005). As Abu-Elwan (2007) mentioned, "the main question posed in a WebQuest can not be answered solely by collecting information; WebQuests force students to synthesize information by constructing or generating an organizational framework to display their data." (p. 32). Moreover, Wilhelm (2004) stated, inquiry allows students not only to consider thoughtful questions but also to use WebQuest as they research their topic. However, "they learn to conduct surveys, use databases, and develop, analyze, and synthesize data" (p. 45).

2.5 WebQuests as an Instructional Method

Instructional methods are pedagogical activities that contain learning outcomes, the roles of teacher and students and the other activities. As Rhynard (2002) stated that new instructional methods including group work, hands-on activities, use of manipulative, building/making models, interactive computer software, and Internet research have been introduced to the instructional environments. Regarding to this issue, Schellens and Vackle (2000) stated that education is also affected by the new approaches in terms of learning and instruction: student-centered, distributed, and collaborative learning. From the part of Internet research meaning "quest" idea, WebQuest has emerged as a new method of instruction. As it is defined above, WebQuest is an instructional method that facilitates inquiry, problem, and project-based learning which learners obtain knowledge through investigating facts as directed by the instructor. According to the results of the study that Kanuka (2005) conducted, the WebQuest appeared to be the most effective instructional strategy for facilitating higher levels of learning.

Designers and educators are trying to adapt existing learning theories and methods to use them in a different way in the distinctive learning medium. Moreover, Clark (1994b) stated that there is no need to act as if each delivery technology requires a new theory of learning and performance. WebQuest method, supporting the some well-known teaching methods, was created and implemented in the dynamic WebQuest environment (which is the aim of this study). The dynamic environment helped to deliver the WebQuest method to the students. This medium may attract and motivate students to engage such kind of instructional environment. Regarding to this subject, Clark (1983) stated, "five decades of research suggest that there are no learning benefits to be gained from employing different media in instruction, regardless of their obviously attractive features or advertised superiority" (p. 450). If the medium delivers a task requiring the use of high-order thinking skills, cooperative group work, hands-on activities, "the learning will occur" (Clark, 1983, p. 454). Thus,

WebQuest method, carried by the dynamic environment, would allow students the most efficient use of their effort to accomplish their assigned task in allocated time.

Clark (1994b) claimed that whenever some researchers find one medium or media attribute that seems to produce desired learning outcomes; this must be interpreted as evidence that instructional methods are the underlying common element of all attributes of media. Moreover, he pointed out that choosing a medium that will deliver method will influence the necessary cognitive process for the desired learning task performance. Additionally, Clark (1994a) claimed that instructional method shapes the activities of the specific topic, whereas Kozma (1991) pointed out that medium shapes and constraints the instructional method carried by the medium according to its technology. On the other hand, every instructional method could be inappropriate to implement in the medium (Kozma, 1991).

A stereotypical WebQuest method offers students Web sources, printed materials or other types of sources that will help to accomplish their task that could be seen as media each. According to the students' characteristics, their prior knowledge, "some will learn a particular task regardless of the delivery device. But others will be able to take advantage of a particular medium's characteristics to help construct knowledge". While they are constructing their own learning, they are influenced by "the cognitively relevant characteristics of media: their technologies, symbol systems, and processing capabilities" (Kozma, 1991, p. 205). As a summary, in the WebQuest method, the learning process are influenced by the text, videos, charts, maps, animations and other available symbol systems on the Web sources offered to the students. Moreover, in the given Web sources, for example, a video related to the topic, containing specific explanation, and visualization of the situation, learners could see this extraordinary event in their conditions even if there is no chance to see it in real-life that may influence their existing schemata. By this way, "capabilities of this medium were employed to provide representations and perform or model operations that were salient to task and that the learners had difficulty providing for themselves" (Kozma, 1994, p. 13).

Presenting content with help of multimedia, showing all aspects of the situations in the form of complex social contexts, offering some characters with the different points of view, demonstrating steps of problem solving in a different symbol system etc. will affect students' attention and learning process. Hence, the capabilities of media will influence learning for particular students, tasks and situations (Kozma, 1994).

2.6   Features of WebQuests

Both short-term and long-term WebQuest have the same critical attributes such as having the same components: Introduction, Task, Information Sources, Process, Evaluation, and Conclusion.

The first component "Introduction" greets the learners, gives some background information about topic. The goal of this part is motivate learners by addressing their interests, ideas, prior knowledge, past experiences or future goals. Regarding to this topic, Lacina (2007) stated, "The purpose of the introduction is to not only introduce the subject matter, but also grab the reader's attention" (p. 251).

The next component "task" gives brief information about what to do at the end of WebQuest project. The importance of this section is to prepare doable and interesting tasks.

The other step is "information sources" such as Web documents, experts available via e-mail or real-time conferencing or other printed materials that help learners to complete the task. Learners do not waste their time to look for the information, instead they just use information preselected by the teacher. This reduces the chance that students will access inappropriate material (Vidoni & Maddux, 2002) and prevent learner from losing direction in the Web.

The next step "process" gives detailed description of the process that learners will go through in accomplishing the task.

The following step is "evaluation" that informs learner about how the product will be evaluated by the instructor. Evaluation criteria should be fair, clear, consistent, and specific to the tasks.

Finally, the last step "conclusion" reminds the learners about what they have learned, and perhaps encourages them to extend the experience into other domains (Dodge, 1995).

There are some other attributes that a WebQuest may have. WebQuest usually requires a group work but in distance education, individual quests might be designed. By adding some motivational elements such as role playing, case studies, scenarios to the subject to be worked, WebQuest can be enhanced. Not only WebQuest can be designed within a single discipline but also they can be interdisciplinary (Dodge, 1995).

2.7 Theoretical Aspects of WebQuests

To enhance the learning conditions of the classroom, teachers try to apply every teaching strategy to their classroom somehow. March (1998) reported that WebQuests were designed to bring together the most effective instructional practices into one integrated student activity. Many studies are conducted to explore the benefits of using WebQuest regarding to the theoretical. Zheng and his colleagues (2005) concluded that WebQuest have four constructs: critical thinking, knowledge application, social skills, and scaffolded learning. On the other hand, March (1998) has grouped these constructs under three headings as: student motivation and authenticity, developing thinking skills and cooperative learning.

Student Motivation and Authenticity

The first thing is to make learner get ready to achieve given goal. By giving authentic task, offering role-playing within a cooperative group and by addressing their needs, interest within a WebQuest activity, learners can be motivated towards learning.

Additionally, authentic assessment also motivates students to do their best and come up with a real group answer (March, 1998).

Developing Thinking Skills

The designs of task determine this aspect. If the task is just recalling, rewording, or simply collecting information from given resources, WebQuest cannot help learners to develop their higher-level thinking. March (1998) stated that a WebQuest forces students to transform information into something else: a cluster that maps out the main issues, a comparison, a hypothesis, a solution, etc. Vidoni and Maddux (2002) stated, "WebQuests challenge student intellectual and academic ability rather than Web searching skills" (p.104). Regarding to find valid resources, Perkins and McKnight (2005) explained, "Students have to evaluate the sites that are used for useful information while eliminating misinformation. This helps students develop their critical thinking skills" (p. 124). Also, Kundu and Bain (2006) stated, "Group members pool their respective research findings, bring their newly acquired knowledge to bear on an issue, formulate a response to a complex, open-ended problem, and propose a reflective and critical solution" (p.7). Moreover, Lacina (2007) explained "Teachers who design or use WebQuests tend to emphasize higher level Bloom's Taxonomy tasks, such as focusing on using information at the levels of analysis, synthesis, and evaluation (p.251). During this process, the teacher serves as the facilitator, when students have difficulties.

Cooperative Learning

March (1998) explained that "By running several WebQuest groups in the same class, students will also see that different solutions were chosen by each team because of the quality of the group members' research and argumentation skills." (para. 15). Moreover, March (1998) also added, "As students complete more WebQuests they will become increasingly aware that their individual work has a direct impact of the intelligence of their group's final product." (para. 15). In addition, Kundu and Bain

(2006) stated, "While, as group, students who undertake a WebQuest interact and work together, each group member carries out a specific, meaningful role" (p. 7).

As Lightner, Bober and Willi (2005) mentioned, "Member responsibilities are social, not merely academic, such as providing support, encouragement, and assistance in completing assignments, and meeting course requirements." (p.13).

Bruce and Bishop (2002) also mentioned about individuals' differences as, "Differences among participants in the inquiry community can thus have different consequences, depending on how they are addressed. A challenge for the inquiry community is to maintain a focus without denying individual experiences, perceptions, and values." (p.708). Moreover, Lacina (2007) added that "WebQuest allow students to work cooperatively to learn and exchange new information, while using technology that provides the multiple forms of information needed to understand a new topic" (p.251).

2.8   Creating a WebQuest

For beginners, creating a WebQuest may be challenging, troublesome, and time-consuming. By the time passed, this creating process will be shortened and ended up with great activities. There are two ways to create a WebQuest: first way is adapting and enhancing existing WebQuests and second one is beginning with a blank screen.

2.8.1   Adapting and Enhancing Existing WebQuests

Defining topic, and goals:

As a starting point, the topic that will be require using Web, understanding, analysis, synthesis, problem solving, or creativity should be chosen and secondly, the goals of the topic should be defined that students will gain at the end of WebQuest activity (Dodge, 2002). The important thing is choosing WebQuests projects well. A WebQuest project must pass filters below:

"The WebQuest should:

- be tied to local, state or national curriculum standards;
- replace a lesson that teacher is not totally satisfied with;
- make good use of the Web;
- require a degree of understanding that goes beyond more comprehension." (Dodge, 1999, para. 2).
- be the best way to teach the specific subject.

Searching possible WebQuests:

To find a WebQuest project that is about a specific topic, firstly, it can be useful to investigate the matrix of the examples on the WebQuest site of San Diego State University (SDSU). Secondly, the "Search" menu of Web Macerası (the product developed for this study) will help to find a WebQuest project that is created in this site. Finally, by using some research techniques in the search engines, it is possible to find a WebQuest project about the topic defined in the previous step.

Deciding to use existing WebQuest as is or not:

If the results match with what is exactly looked for, there should be a decision of using it without any change in that case. Before using this WebQuest, teacher must get the permission from the author by e-mailing to the person who created the WebQuest.

If the results do not match with what is exactly looked for and the WebQuest needs some little changes, in that case, there should be a decision what will be minor adaptations to apply. Next case is to find absolutely no WebQuest projects that match teacher's need. In that situation, teacher should be pick a different topic to work on or tried to create own WebQuest from the beginning (Dodge, 2002). The last case is to find more than one WebQuest project that teacher is interested in. If

that is the case, teacher should keep in mind of qualities of an ideal WebQuest project to choose the best alternative:

- "Links are all working and up to date.
- Pages are attractively laid out and free of spelling, grammar, and technical errors.
- The task is engaging and requires higher-level thinking.
- What is learned aligns well with teacher standards.
- The readability level and tone matches well with students." (Dodge, 2002 para 2).

To ensure the quality of the WebQuest, it can be scored by using WebQuest evaluation rubric and try to modify the items less scored. Unless the author of a WebQuest has already explicitly given permission for others to modify and repost their work, teacher needs to ask.

Publishing and Sharing WebQuest:

Many teachers have limited skills in Web-page construction, even though there are available templates (Vidoni & Maddux, 2002). Therefore, Web Macerası (the product developed for this study) is a good solution to write, edit, and publish WebQuest easily if a person does not have enough technical information. As Piercy (2004) explained that, "An educator does not need to be a computer technology guru to develop a WebQuest. The educator, who has developed a learning goal and a solid plan for the WebQuest, will find ample assistance on the Internet" (p.201).

2.8.2 Beginning with a Blank Screen

Clarifying the Task

Once topic and goals are established, teacher must decide how students will gain those goals by using Web and how they will demonstrate the information discovered.

Regarding to clarifying the tasks, Dodge (2002) pointed out that a well-designed task elicits thinking in learners that goes beyond rote comprehension. Moreover, Dodge offers taxonomy of tasks to the creators of WebQuest to help them manage clarifying the task: retelling, compilation, mystery, journalistic, design, creative product, consensus building, persuasion, self-knowledge, analytic, judgment, and scientific task.

As briefly, retelling tasks want students to report what is discovered by the way of presentation, posters, or reports. Compilation tasks require students to gather information from various resources and transform information into a common format by organizing and creating criteria for choosing information. Mystery tasks require students to solve mystery events or puzzle by absorbing information sources to make inferences and generalizations. Journalistic task wants students to act like reporters covering the event by emphasizing the importance of fairness and accuracy in reporting. In design tasks, students create a product, plan according the predetermined goals for real-life situations. In creative product task, students produce something within in given format by emphasizing creativity. Consensus building tasks require students taking on different perspectives by studying different sets of resources. In persuasion tasks, students persuade audience from a particular point of view. Self-knowledge tasks want students to explore their own understanding. Analytic tasks require students to explain relationship between variables or to investigate one or more things and to find similarities and differences. Judgment tasks want students to evaluate things by creating their own judgment criteria. Lastly, in scientific tasks, students make hypotheses, test hypothesis by gathering information and reporting findings according to the standard form of a scientific report (Dodge, 2002).

Finding Information Sources

After defining topic, goals and clarifying task, it is time to help students to accomplish those goals with the use of Web and other sources of information. The

Web sources should include accurate information related topic, be appropriate students' reading level, credible, up-to-date and interesting to students (Dodge, 2001). Regarding to this topic, Perkins and McKnight (2005) added, "Since the Web is constantly changing, teachers must check their WebQuest links before students attempt to use them" (p.125).

Writing Process

In Process part, task must be broken into meaningful parts including details. In order to help students, it may include some scaffolding tools such as guidelines for interviewing, organization charts, and presentation templates etc (Dodge, 2001).

Evaluating student work

In Evaluation part, students may see how they will be graded according to which criteria. In general, rubrics are used as authentic assessment tools for evaluating student's performance after the completion of a WebQuest project (Pickett & Dodge, 2007). Students should be aware of how they are being graded, which can usually be accomplished with a well-developed rubric (Lipscomb, 2003).

Moreover, Jonassen and his colleagues (2003) mentioned about the evaluation of individual or group performance: "Depending on the WebQuest outcome, it may be difficult to separate student work for individual assessment of a team project. Teachers who want to assess individuals' work should choose or create WebQuest with a product or process outcome that specifies clear division of labor" (p.49)

Closing WebQuest

In the last part of WebQuest, Conclusion, there should be summary of process that student passed through and there may be information to remind the goals gained by completing that activity. Moreover, conclusion part contains some future suggestions about the topic studied.

2.9 Summary

As a summary of the literature, reviewed up to now, it can be stated broadly that WebQuest method used with project-based learning has real contributions for enhancing teaching-learning process. Moreover, WebQuest method is not only an instructional method promoting inquiry, problem and project-based learning but also an effective technology integration strategy in the school environments. Nevertheless, it can be seen as medium offering various Web sources and printed materials that may affect teaching-learning process and the learners who participated to the process of the completion of WebQuest project.

Thus, in order to overcome problems that teacher may encounter during the creation of the WebQuests, to shorten the time of creation, and support students with technology and guidance during the project execution process, an idea of dynamism has came to mind (Gülbahar & Madran, 2006). The flow chart of this dynamic environment is shown in Figure 1 which details can be found in the following section.
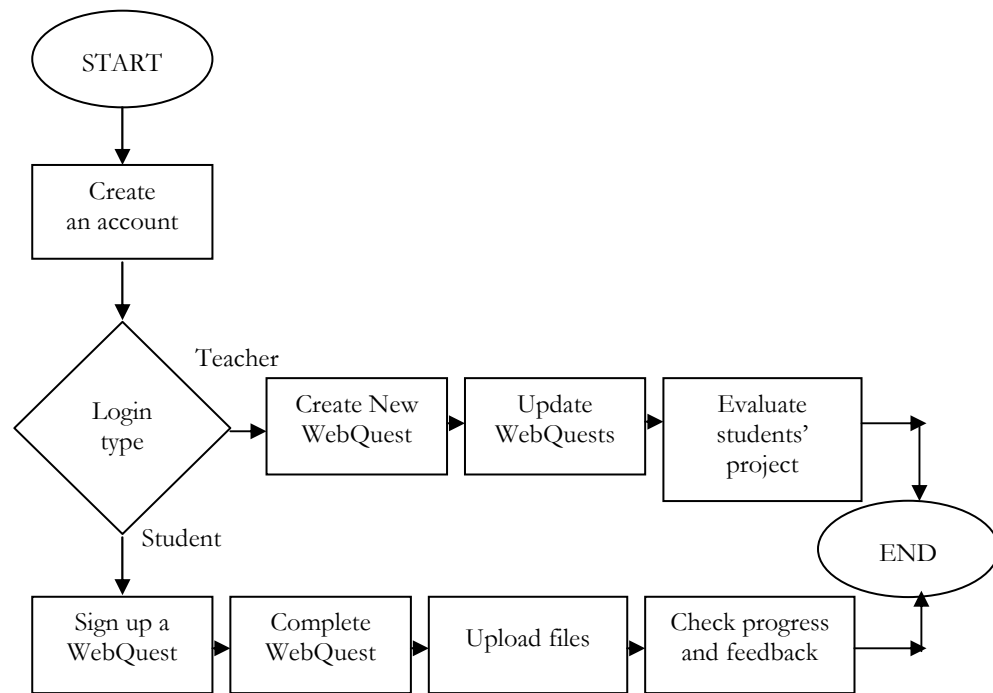
Figure 1 Flow chart of Dynamic WebQuest

By this approach, authoring languages and databases are used to actuate the idea of introducing dynamisms to WebQuests. It is thought that the use of this system will contribute to the diffusion of technology usage in various educational institutions and in different subject fields.

CHAPTER 3

METHODOLOGY

This research was conducted to explore the thoughts about the WebQuest site design, the steps of WebQuest projects and general thoughts about the WebQuests.

The proposed study looked at the following questions:

1. What are the thoughts of the participants about the WebQuest site design in terms of General Design, Grammar, Navigation, and Technical Problems?

2. What are the thoughts of the participants about the steps of WebQuest project in terms of Introduction, Task, Process, Resources, Evaluation, and Conclusion?

3. What are the perceptions of the participants towards working with the WebQuest projects both individually and in a group?

4. What are the general thoughts of the participants about WebQuests?

- How are participants affected by working on the WebQuest project in a planned and guided way?
- What are the problems that participants encountered while completing their WebQuest project?
- What are the thoughts of the participants about designing their WebQuest projects in teaching profession?
- What are the perceptions of the participants about contribution of the WebQuest project into real-life problems that will be encountered?
- Which features of WebQuest site and project are most favored by the participants as top-three?

- Which features of WebQuest site and project are least favored by the participants as top-three?

- What are the participants' suggestions to improve the effectiveness of the WebQuest site?

- What are the perceptions of the participants about supporting project-based teaching method via Web in terms of its contribution to teaching process and other?

- What are perceptions of the participants about the comparison of static and dynamic WebQuest projects they were involved in?

3.1 Participants

The participants of this study were the students of two undergraduate courses offered by the Secondary Science and Math Education Department (SSME) and Computer Education and Instructional Technologies Department (CEIT) of a private university. Since it is difficult to select either a random or a systematic nonrandom sample (Fraenkel & Wallen, 2006, p. 100), a convenience sampling method preferred for the study. Thus, participants were selected due to their accessibility.

The pilot study was conducted in the course named "Computer Programming I" offered to SSME students. This course was offered to the first year students of SSME and lasted in fourteen weeks in spring semester. Weekly schedule of the course consists of four hours where 2 hours for theoretical underpinnings and 2 hours for hands-on experience. The programming logic, data types, structures, functions, loops, arrays, C programming language was the main scope of this course. All 32 students enrolled in this course participated to this study. Among 32 freshmen, there were 23 female (71.9 %), and 9 male (28.1 %). The mean score of the students' age was 19.9. Of these, 31 have personal computer and 22 students use computer more than 4 year, 3 students use computer 3-4 years, 6 students use

computer 1-2 years and 1 student uses computer less than 1 year. Moreover, none of the students has completed any WebQuest project before.

The real study was conducted in the course named "Applications of Authoring Languages in Internet Environment" offered to CEIT students. This course was offered to the third year students of CEIT and lasted in fourteen weeks in spring semester. Weekly schedule of the course consists of four hours where 2 hours for theoretical underpinnings and 2 hours for hands-on experience. The course begins with graphical design for Web pages based on Macromedia Fireworks, and goes on authoring languages like HTML, DHTML, JavaScript, and CSS based on Macromedia Dreamweaver program. All 38 students enrolled in this course were participants of this study. Among these who were junior students, there were 23 female (60.5 %), and 15 male (39.5 %). The mean score of the students' age was 22.92. All the students have personal computer and 25 students have been using computer more than 4 year, 12 students for 3-4 years, and 1 student has been using computer for between 1 and 2 years. Moreover, 31 students have completed a WebQuest project in the previous fall semester within the course named "Foundations of Distance Education". Weekly schedule of the course consists of three hours for theoretical underpinnings during fourteen weeks. The course begins with definition, history and theories of distance education, continues with topics such as instructional design, technologies and media used for distance education, distance education students, teaching at a distance, materials used for delivery of content and evaluation of effectiveness. A static WebQuest project, in which the details are presented in briefly in section 3.3.1, was designed and implemented to the students enrolled in this course.

3.2 Instruments

The Effectiveness of WebQuest Application Questionnaire (EWAQ) was used to answer the first three research questions, which are mainly based on quantitative measure. These questions are related to the thoughts of participants about the

WebQuest site design, the steps of WebQuest project and the perceptions about working both individually and in a group.

The first part of the questionnaire consisted of nine items for eliciting demographics data about participants. The second part of the questionnaire consisted of 22 items for general design of the WebQuest site, in which there were 10 items for general design (α=0.85), 4 items for grammar (α=0.56), 4 items for navigation (α=0.66), and 4 items for technical items (α=0.78). The third part of the questionnaire consisted of 19 items for steps of the WebQuest project in which there were 4 items for introduction (α=0.73), 4 items for task (α=0.72), 4 items for process (α=0.61), 4 items for resources (α=0.71), 4 items for evaluation (α=0.65), and 3 items for conclusion (α=0.67). There were 18 items in the last part of the questionnaire addressing the general thoughts about working individually and in a group for WebQuest projects (α=0.93). All the items in this questionnaire were in the type of 5-likert type scale where 5 was coded as strongly agree, 4 as agree, 3 as neutral, 2 as disagree and 1 as strongly disagree. The item 14 was reverse-scaled before going through the analyses steps. This questionnaire was developed by the researcher according to the items used in the previous research studies about Web site evaluation instruments and WebQuest evaluation rubrics developed (Dodge, 2001; March, 2002; Lara & Repáraz, 2005; Vanguri et al., 2004; eMINTS, 2006). For the content validity, three expert opinions were taken into consideration. The reliability of the developed questionnaire was calculated in the pilot study. The reliability coefficient was 0.93.

In order to gather more detailed information about participants' thoughts on WebQuest method and project, nine open-ended questions were asked to participants for qualitative measure. The first question determined how participants are affected while working in a planned and guided way. The second question revealed the problems of participants' encountered while they were working on their WebQuest project. The next question disclosed the preferences of the participants

about designing their own WebQuests project in their teaching profession. The fourth question determined the perceptions of the participants about contribution of the WebQuest project into real-life problems that will be encountered. The fifth and sixth questions revealed the most and the least favored features as top-three, respectively. The seventh question determined participants' suggestions to improve the effectiveness of the existing WebQuest site. The eighth question determined the perceptions of the participants about supporting project-based teaching method via Web in terms of contributions to teaching process. Finally, the last question revealed the perceptions of the participants about the comparison of static and dynamic WebQuest projects they were involved in.

Expert opinions from three researchers were taken to ensure the content validity of open-ended questions. These open-ended questions were answered online within the course hours in the laboratory by the participants in the pilot study in order to reveal comprehensibility of each item. The analysis of the answers given to these open-ended questions showed that all the questions are clear and no coherence problems exist. Therefore, in the real implementation of this research study, these open-ended questions are used in the focus group interviews, in which the details can be found in section 3.4.3.

After development of the instruments, all instruments were transferred into electronic platform, which is an open source tool for online surveys developed by using PHP. In this way, all data were collected and saved in this system online as it is seen in Figure 2.

Figure 2 Screenshot of Online Questionnaire

3.3 WebQuest Pages

Static WebQuest pages consist of plain, simple, HTML files having navigation bar on the top, on the left side of the screen or anywhere that instructor conveniently chooses. Moreover, there is no interaction within the pages. The assignments for the specific tasks that WebQuest project requires can be submitted to the instructor by e-mail. The preparation of the static WebQuest pages requires using some technical skills about Web page construction. A teacher should find an appropriate template for his or her WebQuest project in the Internet. She or he has to modify the found template to write the steps of the WebQuest project and then she or he has to upload the WebQuest project to a server to publish and share it with the students. If the teacher needs to make some changes for the WebQuest pages, she or he has to modify the pages and again upload it to a server. Moreover, this ongoing process

requires more information about Web page construction and HTML technologies that may make teacher not to prefer creating WebQuest on their own. Additionally, they may fail to create WebQuest projects and may give up if they have great ideas about WebQuest projects. Nevertheless, it is obvious that many teachers do not know how to design a web page or they have limited skills in web page construction (Perkins & McKnight, 2005; Vidoni & Maddux, 2002).

In order to determine the comparison between static and dynamic WebQuests according the experience of the preservice teacher, a static WebQuest project named "I am preparing a project proposal" (Proje Teklifi Hazırlıyorum!) was designed and implemented to the students enrolled in the course named "Foundations of Distance Education" in the previous semester. The WebQuest project details can be seen at Appendix B.

In this study, a dynamic Web site was developed by the researchers for teachers to facilitate teaching, evaluating, and for students to learn, to produce their WebQuest projects. This site was developed by using PHP and MYSQL technologies to create fields to keep records of students and teachers in the databases.

Located under the URL http://webmacerasi.midas.baskent.edu.tr/ "Web Macerası" starts with the login page. The login type and menu vary according to the types of the users: Administrator, Instructor, and Learner. Administrator is responsible for system security and can manage accounts and databases. Instructor can create WebQuest projects in the site; evaluate the applications to his/her own project by confirming, canceling, or deleting application; write feedbacks, give grades related to the task completed for each learner. Learner can apply to the preexisting WebQuest project created in the site; upload his/her files to the tasks and check his/her feedbacks, grades and communicate via e-mail. The details of the site can be seen at Appendix C.

Some features and functions make the Web site dynamic. There is no need to know more information about Web page construction and HTML to create WebQuest

projects in the dynamic WebQuest site. If the teacher has basic ability of using computers, there will be no problem regarding to using dynamic WebQuest site. After having an account in the site, the teacher can create WebQuest projects step-by-step with the help of wizard, meaning that writing descriptions of the WebQuest project steps in text editor and just clicking on the related buttons to progress. Moreover, it is very easy to update each step of the WebQuest project whenever needed.

Actually, the "dynamism" concept in the site gives teachers an opportunity to create, manage, and update each step of WebQuest project easily by just writing, and clicking which makes difference between static and dynamic WebQuest pages. As a contrary to the static WebQuest pages, there is no need to upload the WebQuest project to a server in the dynamic environment, because the WebQuest project is saved in the system and ready to be implemented in the classroom environment. Moreover, there is a chance for students to upload their assignment to related tasks in the system. Furthermore, after expiration of tasks, teacher can evaluate the students' studies by grading and writing feedback.

3.4   Research Model

This study employed both qualitative and quantitative measures in order to develop explanatory thoughts about the WebQuest site, projects and perceptions towards the process and the project. A case study was conducted to answer the research questions previously mentioned.

The data were gathered throughout the spring semester of 2006-2007 school year from the "Computer Programming I" and "Authoring Languages in Internet Environment" courses, offered by the SSME and CEIT departments. The data from the participants were collected in the following manner.

3.4.1 The Pilot Study

The pilot study was conducted to check validity of the questionnaire and open-ended questions. In the pilot study, the teacher of the course was the researcher at the same time. Therefore, researcher created a WebQuest dynamically as a treatment named "Which C language should I choose? (Hangi C dilini seçmeliyim?)" in Figure 3.

Figure 3 WebQuest of the Pilot Study

Which C language should I choose?

Introduction:

The Programming Language Unit in the Faculty wants you to prepare a detailed report about different C programming languages. This report that will be presented

to this unit must cover C programming languages developed differently, and reveal the features of languages.

In this WebQuest, you will comprehend and compare C, C++ and C # programming languages' features and learn more about these languages.

Task:

The report that will be presented to The Programming Language Unit must include C, C++ and C# programming languages. In the report, you must present the comparison of these languages and write a summary including the group member's comments.

Resources:

- [A Web site about computer programming and programming languages](#)
- [A Web site of a book about C programming language](#)
- [A Web site about C++ programming languages](#)
- [A Web site about C # programming languages](#)
- [A Web site about C, C++ and C# programming languages](#)
- [A Web site about C and C++ programming languages](#)
- [A Web site of a library about programming languages](#)
- [A Web site includes comparison of programming languages](#)
- [A Web site includes comparison of programming languages](#)
- [A Web site about popular programming languages](#)

Process:

Complete the tasks with a group of three students. Each document prepared by the group members must be uploaded individually in the site (Figure 4).

Figure 4 Screenshot of the Process

1. Definitions:

- Define the term of programming languages.
- Define C, C++ and C# programming languages each by investigating through the resources given.
- Find and define 5 criteria to compare these programming languages.
- Upload a MS Word document due on the date given.
- Include to your document title page, table of content and references.

2. Table and summary

- Prepare a table that one column has the criteria and other has the programming languages.

- Write two or three paragraph as a summary of these languages including your comments.
- Upload a MS Word document due on the date given.
- Include to your document title page, table of content and references.

Evaluation:

Your report will be evaluated according to these criteria.

Criteria	Basic (0)	Competent (1)	Proficient (2)
Definitions of programming language	The term of the programming language is not defined.	The term of the programming language is partially defined.	The term of the programming language is clearly defined.
Definitions of C,C++ and C#	C, C++, and C# are not defined.	C, C++, and C# are partially defined.	C, C++, and C# are clearly defined.
Definitions of the comparison criteria	The comparison criteria are not defined.	The comparison criteria are partially defined.	The comparison criteria are clearly defined.
Number of the criteria	Number of the criteria is insufficient	Number of the criteria is less than 5	Number of the criteria is more than 5
Summary and comment part	There is no summary and comment part.	Summary and comment part are partially added.	Summary and comment part are clearly added.
Quality of the report	There is no title page, table of contents and references.	The title page, table of content and references are partially added	The title page, table of content and references are clearly added
Overall	Beginning	Developing	Accomplished

Conclusion:

Congratulations! You have completed the WebQuest and learned the features of the programming languages, C, C++ and C #. Try to use this information in the other programming language courses or in your profession.

The Implementation of which C language should I choose?

The researcher introduced the site and projects to the students in the twelfth week of the semester. At the same time, the researcher informed that this WebQuest project is a research study, participation to this study is voluntary, and they were expected to fill out a questionnaire and answer open-ended questions after finishing their projects. The researcher also mentioned that all the collected data would be kept completely confidential. At the beginning of the semester, as explained in the syllabus, the WebQuest project would be evaluated as 15 % as a part of general evaluation. Since, this treatment was conducted for checking validity of the questionnaire, in order to encourage the students to give honest and clear answers, these students were told that 5 % bonus points would be given to them upon completion of questionnaire.

At the beginning of the implementation, the researcher helped participants to login the site with their passports and also answered their questions about the site and project, respectively. The project was designed to be completed in a three–day period having separate assignments for each day. During this period, participants worked on their WebQuest project and uploaded their files related to their tasks to the system. In the class meeting where the students finished their projects, the students were given time to fill out online questionnaire within the course hour. After four days later, participants answered nine open-ended questions about general thoughts for WebQuest in the given Web address within the class hour in the laboratory. (http://bote.baskent.edu.tr/anket/index.php?sid=8)

3.4.2 The Real Implementation

The real implementation of the study was conducted in a course named "Authoring languages in Internet Environment" by getting permission from the course instructor. In this course, a project named "How must our Web site be?

(Üniversiteminizin Web sitesi nasıl olmalı?)" was introduced to the students in thirteenth week of the semester (Figure 5).

Figure 5 Screenshot of the WebQuest

How must our Web site be?

Introduction:

The telephones are ringing from different departments of the university, at about 8 o'clock. While a parent of a student is calling Education Faculty Secretary to notify that she could not find final scores of the spring semester in the Web site, a student is calling Directorate of Transportation to notify that he could not find Beysukent service's takeoff time and direction in the Web site. This kind of telephone rings go all day.

If the Web site of the university included all the information, the telephone traffic would decrease, the personnel would save time, and users would easily access what they are searching for.

Task:

You are supposed to complete two tasks:

- A draft that shows the navigation structure in the site.
- Defining certain politics for managing the Web site.

Your politics will be a text document that will contain the important part. Be sure that it covers the followings:

- Who will manage the Web site?
- Who will check the content and decide to publish?
- Which headings will be in the site, which headings must not be in the site?
- Who will secure and update the server?
- What will the directions related to the content provided by the students be?
- Who will be responsible for graphic design of the site?
- Who will be responsible for the validity and reliability of the published content?

A draft that shows the navigation structure in the site can be designed by Web editor, MS Powerpoint or any graphic design program. Please be sure to prepare more details.

Resources:

Resources differentiate for each character.

1. Dean

- BTHaber

- PCNet

- CHIP Online

2. Instructor

- Technology usage for training teachers

- Technology usage in education institutions and analysis for its effect

- Schools and technology usage

3. Parents

- Computer and Internet Security for children and teenagers

- OkulNET.NET

- Computer and Internet

4. Student

- Web Design

- I am learning HTML

- My Web Teacher

5. Director of Computer Center

- Internet and copy rights

- Copy rights for publications in the Internet environment

- Internet Security

Process:

You are supposed to complete this project with a group consisting of five students. Every group member has to join the meetings in a different statue (dean, instructor, parent, student, and director of computer center). To be successful, you have to

analyze and understand the characters' point of views to the situation and use these points of view of the characters consistently in the meetings.

Before starting, decide which character you will be after reading the information about each character. You can go on after each character is assigned to each member of the group. If you wonder how your performance will be graded, you can check the "evaluation" part.

1. We select the best Web page: First, after analysis of the Web pages given, you as a group must decide which one is the best. Hence, each group member must evaluate all the Web sites of the universities by using "Web Site Evaluation Form" individually.

- Middle East Technical University
- Bogazici University
- Akdeniz University
- Ege University
- Hacettepe University

Then as a group, you must rank the scores for the Web sites and try to write the most favored to least favored in a table format. Upload the "Web Site Evaluation Form" individually and the most favored Web site as a group.

2. We prepare the site map: You have to decide headings and sub-headings of the main page of the university Web site according to the search results in the first step. This study can be designed by Web editor, graphic editor, or a concept map program.

3. We learn about site design: Firstly, you have to read given addresses.

- Research-based Web design and usability guidelines
  http://www.usability.gov/pdfs/guidelines.html

- Information about Web site design with examples
  http://www.webpagesthatsuck.com/
- Web design guidelines http://www.24saat.com/webtasarimiilkeleri.html

Now, open "Instruction for worksheet" template and learn about the Web sites related to our position in the group. In the light of gathered information, upload the instructions for worksheet individually.

4. We prepare an instruction for Web site usage: You have to get together and result in consensus about followings:

- You have to trust each other, state your opinions clearly, listen to each other respectfully, and make sure that group members understand the problem correctly.
- Each group member has to contribute to group work in the regard of each character.
- While discussing, you have to try to be in the scope of the subject and use time effectively.
- You have to construct consensus.
- You have to respect each other's personality.

You have to take into consideration the followings to make your meeting effective.

- Determine the common goals for the project.
- Come to an agreement about what to do.
- Define possible solutions by making brainstorming.
- Organize the results related to the satisfaction of the group members.
- In the case of failure, repeat the steps from the beginning.
- After common decisions, try to guess the effects of the decisions after implementation.

If you are sure that your group have come to an agreement, prepare a result report named "Baskent University – Web Site Usage Direction" including all names of the group members and upload it to the system.

Evaluation:

You can see how your performance will be graded by accessing the Evaluation Criteria.

Conclusion:

Congratulations! You have completed WebQuest, come to an agreement, and meet at a common point as a group, even though you have different characters' point of view.

To address all needs of everybody, you might change and give up some of your ideas. You came to this point by searching, stating your ideas about technical issues, discussing.

From now on, you are ready to manage and design university's Web site to address all needs of target people. Do not forget that Internet and Web provides "7 day 24 hours uninterrupted" service!

The Implementation of how must our Web site be?

Before the project began, the instructor informed that this WebQuest project was a research study, participation to this study was voluntary, and they were expected to fill out a questionnaire. They were also told that the researcher would conduct focus group interviews with volunteer groups. The instructor also mentioned that all collected data would be kept completely confidential.

The WebQuest project for the real implementation was designed to be completed in a nine–day period having separate assignments at least for two days. During this period, participants worked on their WebQuest project and uploaded their files

related to their tasks to the system. In the class meeting where the students finished their projects, the students were given time to fill out online questionnaire within the course hour with the guidance of the researcher. At the same time, the researcher also scheduled focus group interviews for the next week with volunteers. Thus, the researcher conducted structured focus group interviews with participants in order to investigate their perceptions about the WebQuest site and project in a more detailed way.

3.4.3 Focus Group Interviews

In order to gather more detailed information about participants' perceptions, the researcher conducted eight structured focus group interviews with 38 students from 3rd year students in the following week of the implementation. The interviews lasted between 16-48 minutes. Out of 8, 3 groups were consisted of 4 students, 4 groups were consisted of 5 students and last group was consisted of 6 students. All the interviews were digitally recorded with both an audio recorder and a computer. Transcriptions of these records were made by the researcher after each interview session by giving nicknames to participants. However, record of one group could not be transcribed due to sound quality and technical reasons, so the researcher took notes after the interview was finished. Two of the interviews were done by both researcher and another researcher who has experienced in conducting focus group interviews, in order to support and show the key points in interview process.

3.5 Data Analysis

3.5.1 Quantitative Analysis

The quantitative data obtained through questionnaires were analyzed through descriptive methods including frequencies, percentages, mean scores, standard deviations. For the last 18 items, factor analysis was performed. Based on this information, an insight to the data was provided.

3.5.2 Qualitative Analysis

The qualitative data were analyzed by using content analysis method. First, data were transcribed, then coded inductively by three different researchers and controlled, emerging themes were found, data were coded again according to the new emerged themes, and finally, the results were interpreted (Yıldırım & Şimşek, 1999, p. 162-175).

3.6 Assumptions and Limitations

3.6.1 Assumptions

For this study, the following assumptions are established:

- All participants in all groups answered the questions to all measures of this study accurately and sincerely.
- The data were accurately recorded and analyzed.
- Reliability and validity of the all measures used in this study are accurate enough to allow accurate assumptions.

3.6.2 Limitations

- Related to the sampling approach, the results of this study could not be generalized.
- The study was limited in the scope by considering variables in the items included in the questionnaire and interview guide.
- The validity of this study was limited to the honesty of the subjects' responses to the instruments used in this study.

- The content of the WebQuest projects were limited by the lessons of "Computer Programming I" and "Applications of Authoring Languages in Internet Environment"

- This study was limited by the departments of the Faculty of Education, which were Computer Education and Instructional Technology and Secondary Science and Mathematics Education.

CHAPTER 4

FINDINGS

4.1   Quantitative Data Analysis

In this section, descriptive statistics such as mean scores, standard deviation, frequency, percentages are used to explain the quantitative data. The results are organized according to the research question specified in the previous section.

4.1.1   The thoughts of the participants about the WebQuest site design in terms of General Design, Grammar, Navigation, and Technical Problems.

There were 10 items (see Appendix A), which questioned the General Design (GD) of the WebQuest site. The overall mean score of GD was 4.40. The highest mean score for GD was item 7 ($M=4.61$) and lowest mean score was item 10 ($M=3.97$) as it is seen in Table 1. The most valued items concerning GD were listed below with mean scores:

- There is no readability problem on the pages ($M=4.61$).
- The colors used in the design are compatible ($M=4.55$).
- The distribution of the elements on the page is well balanced ($M=4.55$).

Table 1 Mean Scores and Standard Deviations for General Design

	N	Mean	Std. Deviation
GD1	38	4.29	.69
GD2	38	4.39	.64
GD3	38	4.24	.75
GD4	38	4.42	.60
GD5	38	4.55	.69
GD6	38	4.50	.60
GD7	38	4.61	.64
GD8	38	4.53	.65
GD9	38	4.55	.60
GD10	38	3.97	.94

The item, which has the lowest mean score, questioned the appealing of clickable areas. Since, areas, which the links can be followed, are designed in a different way then standard buttons and tabs; it might be difficult to realize these areas without the moving on them. It is thought that designing the site in a manner that gives the concept of the quest logic caused this finding.

There were 4 items, which questioned the Grammar (Gra) of the WebQuest site. The overall mean score of Gra was 3.90. The highest mean score for Gra was item 2 (M=4.37) and lowest mean score was item 4 (M=3.34) as it is seen in Table 2. The most valued items concerning Gra were listed below with mean scores:

- There are no grammar faults (M=4.37).
- There are no spelling faults (M=4.24).
- A comprehensible language is used (M=3.68).

Table 2 Mean Scores and Standard Deviations for Grammar

	N	Mean	Std. Deviation
Gra1	38	4.24	1.02
Gra2	38	4.37	.79
Gra3	38	3.68	1.34
Gra4	38	3.34	1.26

For this part, the item, which has the lowest mean score, is about technical terms used in the site. Although the mean score is around "neutral" idea, checking the site for jargons can lead to better results.

There were 4 items about the Navigation (Nva) of the WebQuest site. The overall mean score of Nva was 4.07. The highest mean score for Nva was item 4 (M=4.34) and lowest mean score was item 2 (M=3.39) as it is seen in Table 3. The most valued items concerning Nva were listed below with mean scores:

- Site provides easy navigation. (M=4.34).
- The navigation bar appears in the same place in the different pages. (M=4.29).
- There is no broken links (M=4.24).

Table 3 Mean Scores and Standard Deviations for Navigation

	N	Mean	Std. Deviation
Nav1	38	4.24	1.22
Nav2	38	3.39	1.44
Nav3	38	4.29	.80
Nav4	38	4.34	.94

There were 4 items about Technical Problems (Tprob). The overall mean score of Tprob was 4.33. The highest mean score for Tprob was item 4 ($M=4.55$) and lowest mean score was item 1 ($M=4.05$) as it is seen in Table 4. The following items were most valued by the participants:

- The system runs without any faults ($M=4.55$).
- Uploading procedure is completed without any faults ($M=4.42$).
- The pages are viewed without any plug-in files ($M=4.29$).

Table 4 Mean Scores and Standard Deviations for Technical Problems

	N	Mean	Std. Deviation
TProb1	38	4.05	.98
TProb2	38	4.29	.77
TProb3	38	4.42	.79
TProb4	38	4.55	.80

The overall mean score of the WebQuest site in terms of General Design, Grammar, Navigation, and Technical Problems was 4.18, indicating that WebQuest site is favored by the participants.

4.1.2 The thoughts of the participants about the steps of WebQuest project in terms of Introduction, Task, Process, Resources, Evaluation, and Conclusion.

There were 4 items which questioned Introduction (Intro) of the WebQuest project. The overall mean score of Intro was 3.82. The highest mean score for Intro was item 1-4 ($M=4.08$) and lowest mean score was item 3 ($M=3.55$) as it is seen in Table 5. The most valued items about Intro were as follows:

- The introduction includes the goals of the project (*M*= 4.08).

- The scope of the project relates to the goals of the course (*M*=4.08).

- The project subject is interesting (*M*= 3.58).

Table 5 Mean Scores and Standard Deviations for Introduction

	N	Mean	Std. Deviation
Intro1	38	4.08	.91
Intro2	38	3.58	1.29
Intro3	38	3.55	.95
Intro4	38	4.08	.85

There were 4 items which questioned Task of the WebQuest project. The overall mean score of Task was 4.06. The highest mean score for Intro was item 4 (*M*=4.29) and lowest mean score was item 1 (*M*=3.79) as it is seen in Table 6. The most valued items concerning Task were listed below with mean scores:

- The characters or tasks in the scope of the project require having different points of view on the subject (*M*= 4.29).

- The project requires a creative product (*M*=4.11).

- The project requires going beyond the data given. (*M*= 4.08).

Table 6 Mean Scores and Standard Deviations for Task

	N	Mean	Std. Deviation
Task1	38	3.79	1.14
Task2	38	4.08	1.05
Task3	38	4.11	.92
Task4	38	4.29	.77

There were 4 items addressing Process (Pro) of the WebQuest project. The overall mean score of Pro was 3.84. The highest mean score for Pro was item 3 ($M=4.34$) and lowest mean score was item 2 ($M=3.37$) as it is seen in Table 7. The most valued items about Pro were as follows:

- When any problems occur in the process part, the instructor can support students ($M= 4.37$).
- The steps of the process include Bloom's taxonomy ($M=4.11$).
- The steps of the process is doable in given time ($M=3.68$)

Table 7 Mean Scores and Standard Deviations for Process

	N	Mean	Std. Deviation
Pro1	38	3.68	1.19
Pro2	38	3.37	1.17
Pro3	38	4.34	.81
Pro4	38	3.97	.97

There were 4 items addressing Resources (Res) of the WebQuest project. The overall mean score of Res was 4.23. The highest mean score for Res was item 3 ($M=4.42$)

and lowest mean score was item 1 (*M*=3.95) as it is seen in Table 8. The most valued items about Res were as follows:

- The Resources include information related to the project (*M*= 4.42).
- The level of the resources is appropriate for the students (*M*=4.32).
- The Web addresses are listed including information that defines the sites (*M*=4.24)

Table 8 Mean Scores and Standard Deviations for Resources

	N	Mean	Std. Deviation
Res1	38	3.95	1.06
Res2	38	4.24	.88
Res3	38	4.42	.68
Res4	38	4.32	.93

There were 4 items about Evaluation (Eva) of the WebQuest project. The overall mean score of Eva was 4.14. The highest mean score for Eva was item 1 (*M*=4.45) and lowest mean score was item 2 (*M*=3.66) as it is seen in Table 9. The most valued items about Eva were as follows:

- The points of the each task are clearly defined (*M*= 4.45).
- The student can receive report and feedback related to his/her performance (*M*=4.37).
- The evaluation criteria clearly measures what students must know and be able to do to accomplish the task. (*M*=4.11)

Table 9 Mean Scores and Standard Deviations for Evaluation

	N	Mean	Std. Deviation
Eval1	38	4.45	.89
Eval2	38	3.66	1.07
Eval3	38	4.37	.85
Eval4	38	4.11	.83

There were 3 items about Conclusion (Conc) of the WebQuest project. The overall mean score of Conc was 4.09. The highest mean score for Conc was item 1 (*M*=4.24) and lowest mean score was item 2 (*M*=3.84) as it is seen in Table 10. All the items about Conc were as follows:

- Conclusion summarizes the process (M= 4.24).
- A decisive message clearly relates students' knowledge to other topics or situations. (M=4.18).
- Conclusion prepares students to real-life situations that will be encountered (M=3.84).

Table 10 Mean Scores and Standard Deviations for Conclusion

	N	Mean	Std. Deviation
Conc1	38	4.24	.82
Conc2	38	3.84	.92
Conc3	38	4.18	.77

The overall mean score of the steps of the WebQuest project in terms of Introduction, Task, Process, Resources, Evaluation, and Conclusion was 4.03, which

may mean that the content of the WebQuest project is understood and the guidance provided to the learners is sufficient.

4.1.3 The perceptions of the participants while working on the WebQuest projects individually and in a group

There were 18 items, which questioned of the participants' perceptions about working individually and in a group while working on their WebQuest projects (WQT). The highest mean score for WQT was item 7 (M=4.74) and lowest mean score was item 2 (M=2.92) as it is seen in Table 11. The most valued items about WQT were as follows:

- I respect the other members' ideas during execution the project (M= 4.74).
- I share my information (M=4.53).
- I value the contributions of the other members to WebQuest project (M=4.34).

Table 11 Mean Scores and Standard Deviation of WQT

	N	Mean	Std. Deviation
WQT1	38	3.61	1.15
WQT2	38	2.92	1.50
WQT3	38	4.13	1.26
WQT4	38	3.16	1.44
WQT5	38	4.34	.78
WQT6	38	4.53	.89
WQT7	38	4.74	.50
WQT8	38	4.13	1.04
WQT9	38	3.97	1.20
WQT10	38	3.55	1.25
WQT11	38	3.74	.98
WQT12	38	3.74	1.27
WQT13	38	3.87	1.12
WQT14	38	3.63	1.26
WQT15	38	3.42	1.20
WQT16	38	3.87	1.14
WQT17	38	3.79	1.21
WQT18	38	4.03	1.24

The gathered data primarily checked whether data were appropriate for factor analysis. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. Kaiser-Meyer-Olkin (KMO) value was found .80 and the Barlett's Test of Sphericity reached the statistical significance (p=.00), supporting the factorability of the correlation matrix.

Of 18 items from participants' perceptions about working individually or in a group were analyzed using principal component exploratory factor analysis. Principal components analysis revealed the presence of four components with eingenvalues exceeding 1, explaining 47.2 percent, 12.2 percent, 7.1 percent, and 5.9 percent of the

variance respectively. An inspection of the screeplot revealed a clear break after the second component. To aid in the interpretation of these two components, Varimax rotation was performed (Table 12). The items 3, 5, 6, 7, 8, and 9 belonged to factor 2 and the remaining items belonged to factor 1. The two-factor solution explained a total of 59.4 percent of the variance, with Component 1 contributing 34.7 percent and Component 2 contributing 24.7 percent.

The mean score of factor 2 (M=4.31) (working in a group) is greater than mean score factor 1 (M=3.60) (working individually). It can be concluded that the students participated in this study tend to work in a group while working on their WebQuest projects.

Table 12 Principal-Components Analysis with Varimax Rotation for Perception of Working Individually and in a Group

	Component	
	1	2
WQT15	.859	
WQT14	.811	
WQT10	.779	
WQT16	.761	
WQT13	.721	
WQT1	.716	
WQT4	.673	
WQT11	.616	
WQT18	.596	
WQT12	.594	
WQT2	.580	
WQT17	.579	
WQT6		.868
WQT7		.835
WQT8		.799
WQT3		.674
WQT9		.568
WQT5		.542

Table 13 Mean Scores and Standard Deviations of the Factor 1 and Factor 2

	N	Mean	Std. Deviation
Working individually	38	3.60	.91
Working in a group	38	4.31	.73

4.2 Qualitative Data Analysis

4.2.1 How are participants affected by working on the WebQuest project in a planned and guided way?

At first, the participants were asked about how they were affected by working on the WebQuest project in a planned and guided way. Only one of the participants responded this approach would not be appropriate for the one who takes the responsibility of his/her learning. This participant stated, "There shouldn't be any orientation for the ones who take the responsibility of their learning… there should be guidance. The unfavorable point of this situation is… I think this might backfire on the part of the individuals." 19 of the participants expressed that being planned and step-by-step progression characteristics of the project is an appropriate approach and this has been beneficial for them in some aspects. One of the participants said, "Segmented time is definitely better". Also another participant explained that disclosing clearly what will be done for the project and the goals to be reached prevents it to be sophisticated, and the other participant stated his idea as "if it is somehow planned, it gives us relief".

One of the participants expressed that if they do not study in a planned way, the project will be deferred to the last day of submission, the details are omitted, and there would be some deficiencies with the final product. Another participant stated, "As a student, even though how much we do, at least explaining the case for me, I can not complete anything before the end. Therefore, in fact, both being in a short time frame, and a deadline made me complete the job somehow in a timely manner." The other participant stated his idea as "it was not a complex thing, it is more difficult to initiate if we don't know what to do", and another participant explained the benefit of working in a stepwise way for not omitting the details of the project and generating better quality end products by stating that "with the explicit timeframe, you continue in line with the starting point of the work more easily, even

though who initiates the project, the opening will be of good quality, and as a result, at the later stages, a product of good quality will be created."

The results revealed that the participants have not succeeded in studying in a planned and disciplined manner yet, they are in need of being oriented by outsiders; and as a result of this orientation, and they became more successful. Even though the students in higher education are expected of having more intrinsic motivation, their need of being extrinsically motivated can be interpreted, as they are unaware of their vocational careers. To conclude, even though in the higher education level, it is a correct approach to carry out the project-based instruction in a long period divided into processes based on days and weeks, bounded to calendar.

4.2.2 What are the problems that participants encountered during the execution of their WebQuest project?

The second question asked to the participants was related to difficulties they encountered while conducting their projects. Six themes emerged from the data obtained for this question. These themes were deficient of being informed about the system, difficulties for meeting of groups, time concern, and inexplicit directives, difficulties related to user logins and uploading files.

Six participants pointed out difficulties to use the web site and the need for information about the use of system. Regarding this issue, one participant stated the difficulty for learning the system while trying to follow the procedure. Another emphasized the need for preparation related to this difficulty. Moreover, some participants stated the need for extra time in order to use the system. The examination of the data revealed that this problem was experienced by three different groups. However, these results are somehow confusing as the participants are the 3rd year students of Computer Education and Instructional Technology department. Therefore, it may be concluded that students may not be skilled enough related to the application.

Eight of the participants mentioned the problem that group members could not get together. Related to this, while one participant said, "as a group, we had difficulty to get together", whereas three participants pointed out problems for creating groups and coming together. The examination of the data revealed that, this problem occurred in three different groups. It is supposed that the reason for this problem might be lack of extra time for group construction. This problem also occurs in-group works in conventional education, as the group members may not get together due to some reasons; hence, it is not surprising to encounter this problem in Web-supported instruction.

Another problem encountered by participants was about scheduling. Some participants (5 students) stated that they had difficulties as the projects of the other courses was mostly conducted at the end of the semester, whereas some (12 students) pointed out the limited time separated for the steps of project. Other six participants stated that the time was not enough as some steps of the project had differentiating difficulty. One participant said, "It was problematic that the project was given at the last two weeks of the semester, everybody has projects", another said, "The time for completion of the steps could have been more". Considering the fact that the courses in curriculum are mostly project-based and the projects are mostly given at the end of the semester, it was not surprising to encounter this time problem.

Another problem faced by 14 participants was that the directions in pages of the system were not clear enough that caused different understandings by students. The students were asked whether they read the directions carefully during the interviews. It is found that they did not read carefully. Instead of reading the directions again, the students preferred to ask other group members, which caused the spread of misunderstanding.

Entrance to the system, registration, confirmation were the problems collected under different themes. A total of 12 participants experienced difficulties regarding these

processes. One said, "It was difficult to register both the system and quest", another said "it would be better if the registration system had been easier". On the other side, there were participants expressing that there were many web sites using this confirmation process for reliability as that they were accustomed to this, as they used user names and passwords many times for other web sites. In fact, some students provided wrong mail addresses to the system; therefore, the confirmation mail could not send to their mail addressees that this situation caused them not to login the site.

Lastly, the problems mentioned by the participants related to the uploading assignments were as (i) uploading only the zip files (3 participant), (ii) erasing the previous file when another uploaded for the same task (5 participants), (iii) not showing the time of deadline of the task (4 participants), and (iv) not noticing that the last uploaded file is an upgraded one of the previous files (3 participants). Some pointed out that they were using "winrar" program mostly while the system accepts the files only compressed by "winzip" program. Very few participants experienced this problem because of their insufficient technical background. The fact that only the zip files were acceptable by the system was an appropriate approach as the winzip program was ready as integrated to the Windows operating system. However, the system may accept other types of files.

The system was erasing the previous files when a new one uploaded for the same task. One participant said, "As it was upgrading the files, only the last uploaded file was available, I could not realize that the previous ones were deleted. Moreover we recognized this two days later". One emphasized the need for warning related to this erasing situation. Regarding to this issue, one participant suggested that all the files should be available at the system. However, it is believed that it is good for the instructor to see the last upgraded file for assessment. These suggestions should be taken into consideration and may be reflected to system.

4.2.3 What are the views of the participants about designing their WebQuest projects in teaching profession?

With regard to the question whether the participants want to use WebQuests for their profession in the future, 32 participants expressed that they wanted to use for different purposes whereas 4 did not want to use. The ones who preferred to use the WebQuest projects, pointed out that they would use if the conditions of the schools (in terms of technical aspects such as having computers and internet connection) and the capabilities of target students (social and cognitive skills such as prior knowledge and ability to use computers) were appropriate. Regarding to this answer, one participant said, "My answer is yes, because it is usable and internet based taking the interest of me". Another explained, "If all the students can access to internet … the classroom environment is suitable, it would be very nice".

Three of the participants stated that they will use in the case of the creation pedagogically appropriate project content, and other three stated that they would prefer in the project based applications taking long time for the use of web. Related to this, one said, "I could do also but, I should design and program appropriately. Because, the users will be primary school students, therefore it should be designed according to their level so that they can comprehend well with the given perfect directions". Another participant said that he preferred a project that was conducted in small steps during the whole semester instead of a final project at the end.

Generally, the reasons for the usage indicated by the participants as follows;

- For encouraging students to study systematically and on time
- For being an alternative method taking the interests of students
- For encouraging the use of computers and technology
- For assessment
- For encouraging group work

- For informing and providing feedback to students related to their homework and assignments
- For collecting all the assignments together in the same space

Related to these reasons for use, one participant said, "It is very good as it can enable students to study systematically and daily, to send their assignments on time and also to get used to this". Another participant reflected his ideas related to assessment such that "it is not product oriented, it is process oriented. We are thinking the criteria about how this project will be evaluated. Therefore, it is good for me". Whereas one student pointed out the reason for use as to encourage students to use the computers, other participant found it interesting saying "I think that students may get bored with traditional methods, so this can get the interest of students. Therefore I prefer to use". One participant emphasized the feature that "it increases the social interaction as it enables group work, by completing each other's deficiency". One participant stated, "It could increase the effectiveness in the application process of such programs as Frontpage, Dreamweaver". Related to the course content, one participant added, "Especially, WebQuest fits to all departments' contents enabling the step by step progression for learning. In my opinion, it should be used." While one participant stated, "it enables to progress step by step as we guide", one offered the process as an adventure covering the whole semester to end up with a good product.

The four participants, who did not prefer to use the system, put forward the facts that the system is complex, there might be plagiarism, and it may not be suitable for big sized projects as the reasons. Regarding to this issue, one participant stated, "I do not think to use … the internet is so available for plagiarism… it may be better implement in a classroom setting", whereas the other said "I do not use if technological infrastructure is not appropriate."

Generally, it is found that most of the participants were positive towards using WebQuest in their teaching profession. The fact that participants wanted to use the

system for their profession in the future might be seen as an indicator of positive attitude toward the system. However, availability and suitability of technical conditions found as crucial important for the use.

4.2.4 What are the perceptions of the participants about contribution of the WebQuest project into real-life problems that will be encountered?

When the participants were asked about the contribution of the project to their lives, it was seen that they could not foresight and could not establish a connection between their experience and real lives. Related to this, three participants indicated that the system was enabled to use the time efficiently, as it did not allow flexibility. Six of the participants stated that they gained new perspectives and could empathy with the help of roles given. One said "at least it enables us to think from multiple perspectives... we can think differently from all aspects", another said, "We could understand how things differ according to different people during this WebQuest project". In addition, one participant emphasized this situation by summarizing the fact "when we put ourselves in each role, we actually noticed the difference. This will enable us to examine from multiple perspectives when we also encounter a problem in our daily lives". Moreover, one explained its contribution in terms of supply and demand as it enabled empathy to understand the expectations of different people.

Two participants stated that they now have knowledge when they meet with a similar situation in their lives and four stated that they gained experience on design and evaluation. Based on these results, it may be conclude that the roles in WebQuests can yield positive outcomes and that time restriction can lead to learn how to plan their study.

4.2.5 Which features of WebQuest site and project are most favored by the participants as top-three?

When the participants were asked the three features of the system that they favored mostly, the result showed that both the design and WebQuest method itself were favored by the students. 17 participants stated that they liked the colors and content, and the usability of the web site. Regarding to this answer, one said, "For me, the design was great taking the interest of me and emphasizing the purpose as research". 16 students valued the representation of objectives, availability of the sources, step-by-step procedure for the project and deadlines for assignments. Some participants (12 students) stated that uploading files and receiving feedback for their assignments was very useful. Nine participants also stated that the roles helped to enable empathy and increased their creativeness. One said, "The representation of the grades was so good. Also the registration process", other said, "the formation was very good, WebQuest was taking the interest of us, I mean the name was really attractive". It may be concluded that dynamic WebQuest approach is a good approach basing on the fact that both the content and the system was valued by the students.

4.2.6 Which features of WebQuest site and project are least favored by the participants as top-three?

Few opinions were emerged when the participants were asked three least favored features of the system. Moreover, it can be said that there were not big problems so that the system does not need for a major change. However, there might be some minor changes in order to increase the effectiveness of the system as well. 7 participants explained the need for deadline extension for the tasks, 6 participants stated the need for more clear directions, and 4 participants emphasized the need for a platform for interaction with others. As the participants were few in the study, it might be said that the system was valued generally.

4.2.7 What are the participants' suggestions to improve the effectiveness of the WebQuest site?

The participants were asked to share their suggestions about making the system more effective and numerous demands were taken. Since this study is a case study and only a demand is crucial, all suggestions made were taken into consideration even if one participant stated. The suggestions made by participants are listed with their participant number:

- Presenting communication tools (forum, chat etc.) (14)
- Adding illustrations, graphic and animation (12)
- Providing an information system via e-mail ("the evaluation has performed", "files upgraded" etc.) (5)
- Presenting detailed help and adding a video introducing the system (4)
- Giving opportunity to change the colors based on page, project or task (4)
- Supporting different file extensions (.zip and .rar) (4)
- Giving opportunity to share uploaded files (4)
- Giving information about completion of the tasks (3)
- Confirmation instantly to applications (2)
- Being inactive of the unused buttons (2)

These obtained data showed that all suggestions were about technical features that will contribute to the effectiveness of the system.

Each suggestion offered by only one participant is as follows:

- Not allowing to progress in the case of incompletion of the previous task
- Giving more clear and comprehendible directions
- Forming chat room for groups with passwords
- Having opportunity of peer assessment

- Conducting project in a wider periods.

4.2.8 What are the perceptions of the participants about supporting project-based teaching method via Web in terms of contribution to teaching process and other?

The participants generally explained their positive thoughts about supporting project-based teaching method via Web environment. Seven participants explained about WebQuest approach offering use of internet resources that they felt confidence in the case of provided resources by the instructor, they were prevented from getting lost in the internet environment while researching and directed to research. Five of the participants stated that the points offered for the projects affect the allocated time for working and the quality of the products created, respectively. Three participants emphasized the need of more Turkish resource. The fact that submitting the project from web environment decreases the cost is found favorable by the two participants. One participant stated, "In my opinion, I can access the directions 7 days 24 hours, this is a big advantage. Which task will be completed is clear. Very good". Providing the project content from the web environment, and offering use of web resources is found as favorable results.

4.2.9 What are perceptions of the participants about the comparison of static and dynamic WebQuest projects they involved?

The participants were required to compare their experience of static WebQuest in the course they attended in the previous semester with the dynamic WebQuest in the course of this semester. One of the differences expressed was the easiness and reliability of uploading the homework to the system than sending by e-mail. Three participants stated that in the static approach, the print-outs can be handed out in the class; the existence of the materials on the internet is not functional. Three of the participants pointed out that the dynamic environment motivated and attracted them.

The other two participants told that registering to the system created a feeling of belonging and adoption. Three participants mentioned about using static WebQuest content to complete in the dynamic environment. At this point, one of the participants stated his preference by conveying that all the tasks should be explained in only one word document. In both of the WebQuests, there were different roles, and those roles' increasing the motivation for learning the subject, also those roles helped the students to evaluate the assigned roles in the different point of views has been explained by 9 of the participants. About the dynamic system, one of the students stated, "You are in a real adventure. This could be a detective story, or an incident of thief and police, and in that kind of incident, you suddenly indulge yourself to the role and finish the adventure, you can think that you have learnt so much things and how much things you had done." To evaluate as a whole, the approach of dynamic WebQuest has been enjoyed by the participants.

CHAPTER 5

DISCUSSION AND IMPLICATIONS

5.1 Discussion and Conclusion

This study is mainly based on the idea of effective integration of the technology into higher education. Nowadays, the learner-centered, active learning approach, which is used by all educational institutions, shapes education. This approach requires learner to take his or her own learning responsibilities, which makes teacher to use alternative teaching methods in instructional environments. Among these teaching methods, project-based, problem-based, inquiry-based approaches are the ones, which are frequently used by the instructor. Although constructivist methods used to make learners active participants of teaching learning process, the importance of cognition must be taken into consideration. In terms of cognitive strategies, the expectations from learners like higher-order thinking and meta cognition, should also be objectives, which the instructors try to accomplish. Specifying learning outcomes in such a way that covers the goals of constructivism and cognitivism as mentioned previously, authentic tasks and learning environments are choices, which fulfill the requirements of both approaches. One of the common points of both approaches to learning is social learning which also emphasizes the importance of collaboration in learning tasks. All of these expectations may be met through WebQuest method. Moreover, Lamb (2004) added, "Rather than writing an essay or making a speech for a teacher, quality WebQuests requires students to connect their understanding of information to meaningful situations through original products for authentic audiences." (p. 40).

For the current study, managing content, uploading files, getting feedback and completing all the tasks according to time schedule required use of technology,

databases, and authoring languages in harmony. This is why researchers introduce the term "dynamic" to WebQuest method and conduct this study. In such a research study many variables and outcomes like higher-order thinking skill, motivation, social skills, collaboration etc. could be investigated. Before going any further, researchers try to guarantee that a dynamic environment really works. Therefore, perceptions and preferences of participants about Web site, the content and flow of the project were examined to prepare an initial step for further investigations.

As the first part, participants' thoughts about WebQuest sites' general design were obtained. Regarding to the findings, both the quantitative and qualitative data revealed that participants favored the site in terms of General Design, Grammar, Navigation, and Technical Problems. Since the site was designed according to Carroll's (1990) Minimalist Theory supporting the quest logic under the guidance of visual design principles, these results were expected and did not surprise the researchers. Moreover, statements from the interview about design of the site pointed out that the visual elements supported the concept of WebQuest and took interest of the participants.

As the second part, participants' thoughts on the content of the project, namely the WebQuest project itself was examined. The content part is the part, which is out of control of the researchers, thus supplied by the course instructors. Both the quantitative and qualitative data revealed that, the steps of the WebQuest project in terms of Introduction, Task, Process, Resources, Evaluation, and Conclusion were said to be easily understood and the guidance provided to the learners was sufficient. The introduction part, including the goals of project with an interesting subject, helped students to adapt to their WebQuest project. The characters, having different points of view on the subject, motivated students during execution of the WebQuest project and helped them to use their empathy skills to arrive at a common point by building consensus. The time of allocated for the steps was found insufficient by the participants. Internet resources, including information related to the project subject, provided participants not to lose direction in the Web and they felt confidence about

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the validity of resources since the resources offered by the instructor. The evaluation criteria were provided to students which they stated that this feature make tem feel comfortable. All these standard parts are the minimum requirements of an ideal WebQuest project, regardless of the WebQuest site used for this study.

As another part of the study, participants' thoughts about process they engaged in during execution of the WebQuest project were solicited. The findings showed that the participants favored working cooperatively during execution of the WebQuest project, which is one of the main goals of using WebQuest approach. Moreover, quantitative data supported the result that these participants tended to work in a group while working on their projects. Additionally, these findings match with another study's findings, Gorghiu and his colleagues (2005) that:

> "The greatest gain of the WebQuest implementation was obtained in pupils' motivation and cooperative work. This fact is reasonably justified through the involvement of the pupils as actors in the learning process, assuming different roles in the team designed in the frame of the WebQuests. Pupils became enthusiastic by playing a specific role and relaying on the group partners, learning easier in this way" (p. 4).

When the results of the open-ended questions' results were investigated, more detailed, explanatory findings were obtained. These findings revealed that most of the participants affected positively by working on the WebQuest project in a planned and guided way and they found this approach was suitable since, it provided systematic progression. Contrasting to this answer, one participant stated that this approach would not be appropriate for the people who took the responsibility of his/her own learning. On the other hand, the results showed that the participants have not succeeded in studying in a planned and disciplined manner yet; they are in need of being oriented by outsiders. Even though the students in higher education are expected of having more intrinsic motivation, their need of being extrinsically motivated could be interpreted, as they are unaware of their vocational careers. To conclude, even though in the higher education level, it is a correct approach to carry out the project-based instruction in a long period divided into processes based on

days and weeks, bounded to calendar. Moreover, WebQuests can yield positive outcomes and time restriction can lead to learn how to plan their study.

The participants defined their problems they faced during the execution of their WebQuest projects under six headings as: having no information about the system, difficulties for meeting of groups, time concern, and unclear directives, difficulties related to user logins and uploading files. As Lipscomb (2003) mentioned that, there should have been an orientation at the beginning of the project that would help students to use time to go more smoothly and adapt the site. Not providing such an orientation should have made some participants have difficulties while registering to the system. However, some results were confusing since, the participants, the 3rd year students of Computer Education and Instructional Technology department, were expected to be more skilled enough related to the application to overcome some technical problems that they encountered.

Having no extra time for group construction might cause difficulties for forming and meeting of groups. This problem also occurs in-group works in conventional education, as the group members may not get together due to some reasons; hence, it is not surprising to encounter this problem in Web-supported instruction.

Another problem stated by the participants was shortness of the time provided to complete the project. Such a problem was also encountered by other researchers. They concluded in their study that: "The second most prevalent negative comment concerned the time involved. One problem was that the WebQuests could not be completed in the allotted time" (Perkins & McKnight, 2005, p. 131). Having many projects in all the courses, having all the projects at the end of the semester, and overloaded study may cause students to complain about time schedule. Therefore, it might be better if the projects and Web experiences were spread through the whole semester in the design process in terms of increasing the quality of students' products.

Another problem encountered by participants was that the directions in pages of the system were not clear enough that caused different understandings by students. The students were asked whether they read the directions carefully during the interviews. According to the probe and sub questions, the researchers revealed that misunderstandings of the participants were due to reason that they did not read carefully enough and they confessed their under estimation about reading the instructions. Instead of reading the directions again, the students preferred to ask other group members, which caused the spread of misunderstanding. At this point, it could be said that illustration of directions with examples might yield better understanding. Moreover, providing clear-cut and easily understandable description of tasks and process is of vital importance to learners for completing the specified tasks correctly without any deficiencies. This point is also underlined by Woods and his colleagues (2004) that learner understanding of the task(s) and process should be checked before they begin developing their project. Thus, Lipscomb (2004) added that "At the beginning of the WebQuests, make sure that each student understands his or her responsibility, and continue to monitor progress throughout the activity" (p. 154).

Entrance to the system, registration, and confirmation were the problems collected under different themes. In fact, some students provided wrong e-mail addresses to the system; therefore, the confirmation mail could not send to their e-mail addressees. Realizing that situation after a while might cause them to wait for confirmation, which would never be sent.

Lastly, the problems mentioned by the participants about uploading only the zip files, erasing the previous file when another uploaded for the same task. They pointed out that they were using "winrar" program mostly whereas the system accepts the files only compressed by "winzip" program. The fact that only the zip files were acceptable by the system was an appropriate approach as the "winzip" program was ready as integrated to the Windows operating system. However, considering other operating systems, the system should support different file extension.

About using their WebQuest projects in future career, it is found that most of the participants are willing use WebQuests for their profession for different purposes. The ones who preferred to use the WebQuest projects, pointed out that they would use if the conditions of the schools and the capabilities of target students were appropriate.

Generally, the reasons for the usage explained by the participants as follows;

- For encouraging students to study systematically and on time
- For being an alternative method taking the interests of students
- For encouraging the use of computers and technology
- For assessment
- For encouraging group work
- For informing and providing feedback to students related to their homework and assignments
- For collecting all the assignments together in the same space

Contrary to this result, four participants express their unwillingness. These participants put forward the facts that the system is complex, there might be plagiarism, it may not be suitable for big sized projects as the reasons, and the infrastructure might be insufficient. They also underlined the importance of access to computers and Internet for effective usage.

Generally, it was found that most of the participants were positive toward using WebQuest in their teaching profession. However, availability and suitability of technical conditions found as crucial important for the use.

When the participants were asked about the contribution of the project to their lives, it was seen that they could not foresight and could not establish a connection between their experience and real lives. Moreover, they thought that working in a planned way might help them to use time effectively. With the help of studying the perspectives of the characters, they could see how things differ according to different

people. Regarding to this result, Kundu and Bain (2006) mentioned that by working as a group with the same goal having individual tasks, students will experience how it will be in a real work place with the people differing jobs, working toward one goal.

The participants explained the top-three features they most favored as colors of the Web site, content of the WebQuest project, and presentation of objectives. Moreover, participants found some opportunities useful: availability of the sources, step-by-step procedure for the project and deadlines for assignments, uploading files, receiving feedback for their assignments, and roles enabling empathy. Regarding to the importance of feedback, Gubacs (2004) added, "Feedback is one of the most important aspects of improving performance because it corrects, reinforces, and motivates. It also enables students to see that their performance is important" (p. 43). It may be concluded that dynamic WebQuest is a good approach regarding to both the content and the system.

As opposite of the previous findings, no least favored features were emerged. Thus, it could be said that there were not big problems so that the system did not need for a major change. However, they stated that some minor changes might increase the effectiveness of the system, which is explained in detail below. As the participants were few in the study, it might be said that the system was valued generally.

Among the suggestions, the participants expressed their need for deadline extension for the tasks, more clear directions, and a platform for interaction with others. Further suggestions made by participants are listed below:

- Presenting communication tools (forum, chat etc.)
- Adding illustrations, graphics and animation
- Providing an information system via e-mail ("the evaluation has performed", "files upgraded" etc.)
- Presenting detailed help and adding video introducing the system
- Giving opportunity to change the colors based on page, project or task

- Supporting different file extensions (.zip and .rar)

- Giving opportunity to share uploaded files

- Giving information about completion of the tasks

- Confirmation instantly to applications

- Being inactive of the unused buttons

These obtained data showed that all suggestions were about technical features that will contribute to the effectiveness of the system. The comments about applicable suggestions are open to criticize. Adding a forum to the system will help to communicate. Since, the illustrations for WebQuests will be used by the instructor who creates the WebQuest; there may be a warning about this subject. The video introducing the site is a necessary component for the system. Being changeable of color based on project and page is applicable but the instructor may use this feature if system provides. The more experienced, the more illustrated content will be presented. Giving visual information about completion of the tasks is very logical expectation and the system should be upgraded in this way. Being inactive of unused or out of authority buttons is another applicable suggestion.

Moreover, sending e-mail when the files graded, is another suggestion that should be taken into consideration. Because of being widespread of using ".zip" file extension and allowing compressing in more than one file in a directory, it should be seen as a standard approach. However, the other types of the file extension should be accepted. The suggestion about sharing files after upgrading opportunity is expired; cannot be applicable because, this system is designed for WebQuest projects not for content management systems. The participants may have been affected by using a similar system in the previous semester. The last suggestion made by the participants, the instant confirmation to the application, can be provided by automatic-confirmation mailing systems.

The other suggestions, which are offered by only one participant, are as follows:

- Not allowing to progress in the case of incompletion of the previous task
- Giving more clear and comprehendible directions
- Forming chat room for groups with passwords
- Having opportunity of peer assessment
- Conducting project in a wider periods.

The first suggestion may be applicable for the types of WebQuest Projects in which have independent tasks that does not relate to each other. A warning message for instructor to write more clear and comprehendible directions can be provided. Forming chat rooms for groups can be actuated in the system. Peer assessment is another issue that should be considered, since, it may motivate students in order to work hard. The last suggestion offered is related with the instructor that conducts the projects for learners not related with the system directly. Therefore, teacher should conduct project in a wider periods in order to help students to adjust their time of study of all lessons..

As another finding, the participants generally explained their positive thoughts about supporting project-based teaching method via Web environment. When the resources are provided by the instructor, the participants felt confidence, prevented from getting lost in the Web, directed to search. Moreover, providing the project content from the Web environment, and offering use of Web resources were found as favorable results. Although resources are found as efficient by many participants, some of them underlined the lack of Turkish resources, which is a big problem for any learner and instructor in Turkey. On the other hand, participants stated their favor and trust to the resources since they were provided by the instructor. Regardless of age, resources suggested by instructors gains more attention than the ones individually found. Lipscomb (2003) also underlines the fact that provides more guidance in learning tool not only helps students how to search on the Web, but also how to evaluate information found on the Web.

When participants were expected to compare a static and dynamic WebQuest approach, both of which they experienced, it can be concluded that they favored the dynamic one, but wanted a printed document of all the content due to their anxiety about accessibility of Internet. One of the differences expressed was the easiness and reliability of uploading the homework to the system than sending by e-mail. The participants added that the printouts could be handed out in the class; the existence of the materials on the Internet is not functional in the static approach. The dynamic environment was found as more attractive. In addition, registering to the system created a feeling of belonging and adoption. They wanted to complete the previous WebQuest project in the dynamic structure. In both of the WebQuests, there were different roles, and those roles motivated participants for learning the subjects. To evaluate as a whole, the participants have enjoyed the approach of dynamic WebQuest more than static one.

Overall findings showed that using a dynamic WebQuest approach encourages participation to projects, helps students work in a planned and guided way, and motivates students to complete their tasks in time, supports application of theoretical knowledge to different situations. Although, some points offered to make the Web site more effective, these were related with the content, which is entered to the system by the instructor. Except for few modifications to the Web site, the features provided were efficient and effectively used by the participants.

Hence, followings are suggested for instructors for enhancing dynamic WebQuest approach in terms of both Web site and content of the project. Moreover, the instructor should control to what extend the instructions were understood by using face-to-face or online communication.

- WebQuest projects should be organized in such a way that gives the opportunity to students to complete the tasks in doable time intervals.
- The learners should be provided with extra time to introduce the Web site and features, as well as form the project groups (if necessary).

- Instructors should use a comprehensible and clear language and explanations, which is supported by graphics as much as possible.

5.2 Future Recommendations

Dynamic WebQuest method can be used for various purposes like;

- Encouraging students to study systematically
- Using an authentic assessment method
- Integrating technology into curriculum
- Encouraging group work
- Informing and providing feedback to students related to their homework and assignments
- Improving higher-order thinking skills
- Supporting the use of inquiry-based, project-based and problem-based learning environments
- Making students create their own WebQuests
- Following their own progress about their learning

Any application of these suggestions could be a further study, which questions the effectiveness of using instructional methods, assessment techniques, authentic tasks, collaborative projects etc. in WebQuest environment together with individual characteristics like higher-order thinking skills, comprehension level and study habits.

Possible future research studies can seek answers to following questions:

- What is the effect of inquiry based, problem based and project based teaching methods used for WebQuest project on retention?
- What is the role of collaborative projects in the WebQuest environment on developing higher-order thinking skills and social skills?

- What are the perceptions of students about using WebQuest as a formative and summative assessment technique?

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APPENDIX A

INSTRUMENTS USED IN THE STUDY

Web Macerası Uygulamasına İlişkin Etkililik Anketi

Bu çalışma, Web Macerası sitesine ilişkin kişisel düşüncelerinizi almak amacıyla tasarlanmıştır. Verdiğiniz yanıtlar bu araştırma çerçevesinde kullanılacak ve gizli tutulacaktır. Araştırmaya yaptığınız katkılardan dolayı teşekkür ederiz.

Web Macerası Geliştirme Grubu © 2007

❶ **KİŞİSEL BİLGİLER**

Adınız ve soyadınız:

Cinsiyetiniz: ☐ Kadın ☐ Erkek

Sınıfınız: ☐ 1   ☐ 2   ☐ 3   ☐ 4

Bölümünüz:_____

Yaşınız:_____

Bilgisayarınız var mı?: ☐ Evet ☐ Hayır

Kaç yıldır bilgisayar kullanıyorsunuz? :

☐ 1 yıldan az ☐ 1-2 yıl ☐ 3-4 yıl ☐ 4 yıldan fazla

İnternete nereden erişim sağlıyorsunuz?

☐ Okul ☐ Ev ☐ Yurt ☐ İnternet Cafe ☐ Diğer

Daha önce "Web Macerası" deneyiminiz oldu mu?: ☐ Evet ☐ Hayır

❷ **WEB MACERASI SİTESİNİN TASARIMINA İLİŞKİN GÖRÜŞLER**

Aşağıdaki soruları **yalnızca** Web Macerası **sitesinin tasarımını** düşünerek yanıtlayınız. *Sistem içerisinde yaratılmış olan Web maceraları kapsam dışındadır.* Lütfen her bir maddeyi dikkatle okuyarak sizin için en uygun olduğunu düşündüğünüz seçeneği işaretleyiniz.

Yanıtlarınızı aşağıdaki ölçeğe göre değerlendiriniz:

5. Kesinlikle Katılıyorum

4. Katılıyorum

3. Kararsızım

2. Katılmıyorum

1. Kesinlikle Katılmıyorum

GENEL TASARIM (Web sitesinde yer alan sayfalar açısından yanıtlayınız)	5	4	3	2	1
1. Ekran tasarımı görsel olarak etkileyicidir.					
2. Kullanılan görsel öğeler içerikle tutarlıdır.					
3. Görsel öğeler kullanıcıya bilgi vermektedir.					
4. Ekran etkili bir şekilde kullanılmıştır.					
5. Sayfaların tasarımında kullanılan renkler uyumludur.					
6. Sayfalar görsel tasarım ilkelerine uygun hazırlanmıştır.					
7. Sayfalarda okunabilirlik sorunu yoktur.					
8. Sayfa öğelerinin hizalanması uygun biçimdedir.					
9. Öğelerin sayfa içerisinde dağılımı dengelidir.					
10. Tıklanabilir olan alanlar dikkat çekmektedir.					
DİLBİLGİSİ (Web sitesinde yer alan sayfaların <u>içeriği</u> açısından yanıtlayınız)	5	4	3	2	1
11. İmla hataları <u>bulunmamaktadır.</u>					
12. Dilbilgisi hataları <u>içermemektedir.</u>					

	5	4	3	2	1
13. Anlaşılır bir dil kullanılmıştır.					
14. Anlaşılması zor, teknik ifadeler yer almaktadır.					
GEZİNTİ (Web sitesinde yer alan sayfalar açısından yanıtlayınız)	**5**	**4**	**3**	**2**	**1**
15. Çalışmayan bağ (köprü) bulunmamaktadır.					
16. Bağlar (köprüler) yeni bir sayfada açılmaktadır.					
17. Sayfadaki yönlendirme tuşları farklı ekranlarda aynı şekilde kullanılmıştır.					
18. Site içerisinde kaybolmadan gezilebilmektedir.					
TEKNİK PROBLEMLER (Web sitesinde yer alan sayfalar açısından yanıtlayınız)	**5**	**4**	**3**	**2**	**1**
19. Sayfalar hızlı yüklenmektedir.					
20. Sayfalar eklenti (plug-in) gerektirmeden kullanılabilmektedir.					
21. Siteye dosya yükleme işlemi sorunsuz tamamlanmaktadır.					
22. Sayfalar hatasız çalışmaktadır.					

❸ WEB MACERASI PROJESİNİN ADIMLARINA İLİŞKİN GÖRÜŞLER

Aşağıdaki soruları Web Macerası projenizin adımlarını düşünerek yanıtlayınız. Lütfen her bir maddeyi dikkatle okuyarak sizin için en uygun olduğunu düşündüğünüz seçeneği işaretleyiniz.

Yanıtlarınızı aşağıdaki ölçeğe göre değerlendiriniz:

5. Kesinlikle Katılıyorum

4. Katılıyorum

3. Kararsızım

2. Katılmıyorum

1. Kesinlikle Katılmıyorum

GİRİŞ	5	4	3	2	1
23. Giriş kısmı, projenin amacını yansıtmaktadır.					
24. Proje konusu ilgi çekicidir.					
25. Giriş kısmı, projede ne yapılması gerektiğini yeterince açık belirtmektedir.					
26. Projenin kapsamı, dersin kazanımları ile tutarlıdır.					
İŞLEM	5	4	3	2	1
27. İşlem kısmı, projede istenileni açık bir biçimde ifade etmektedir.					
28. Proje bilgiyi farklı şekillerde yorumlamayı gerektirmektedir.					
29. Proje kapsamında yaratıcı bir ürün oluşturma istenmektedir.	5	4	3	2	1
30. Proje kapsamındaki roller veya işlemler farklı bakış açısına sahip olmayı gerektirmektedir.					
SÜREÇ	5	4	3	2	1
31. Süreç adımları, verilen zaman diliminde tamamlanabilecek biçimde düzenlenmiştir.					
32. Her bir adım açık ve net bir şekilde ifade edilmiştir.					
33. Süreç kısmında sorun yaşandığında dersi veren öğretim elemanından yardım alınabilmektedir.					

	5	4	3	2	1
34. Sürecin adımları, Bloom'un taksonomisinde yer alan farklı basamakları (bilgi, kavrama, uygulama, analiz, sentez ve değerlendirme) kapsamaktadır.					
KAYNAKLAR	**5**	**4**	**3**	**2**	**1**
35. Proje süresince ihtiyaç duyulan bilgiler için eklenen kaynaklar yeterlidir.					
36. Web adresleri, siteyi tanımlayan bilgilerle birlikte verilmiştir.					
37. Kaynaklar, proje ile ilgili bilgileri içermektedir.					
38. Kaynaklar öğrencinin seviyesine uygundur.					
DEĞERLENDİRME	**5**	**4**	**3**	**2**	**1**
39. Her görevin puanlaması açıkça ifade edilmiştir.					
40. Görevlerin zorluk derecesine göre uygun puanlar verilmiştir.					
41. Öğrenci, performansına ilişkin rapor ve dönüt alabilmektedir.					
42. Değerlendirme kriterleri kazandırılması hedeflenen bilgi ve becerileri ölçmektedir.					
SONUÇ	**5**	**4**	**3**	**2**	**1**
43. Sonuç bölümü, süreçte yaşananları özetlemektedir.					
44. Sonuç bölümü, öğrenciyi gerçek yaşamda karşılaşılan durumlara hazırlamaktadır.					
45. Sonuç bölümünde verilen mesaj öğrencilere geldikleri nokta hakkında açıklayıcı bilgi vermektedir.					

❹ WEB MACERASI HAKKINDA GÖRÜŞLER

Aşağıdaki soruları Web Macerası projenizi tamamlama sürecinde yaşadıklarınızı düşünerek yanıtlayınız. Lütfen her bir maddeyi dikkatle okuyarak sizin için en uygun olduğunu düşündüğünüz seçeneği işaretleyiniz.

Yanıtlarınızı aşağıdaki ölçeğe göre değerlendiriniz:

5. Kesinlikle Katılıyorum

4. Katılıyorum

3. Kararsızım

2. Katılmıyorum

1. Kesinlikle Katılmıyorum

		5	4	3	2	1
1.	Bu proje beni araştırmaya yöneltti.					
2.	Projeyi tamamlama sürecinde zaman sorunu yaşamadım.					
3.	Kendimi grup çalışması için uygun buluyorum.					
4.	Projeyi yürütürken öğretim elemanından yardım almaya hiç gerek duymadım.					
5.	Web macerasına üye olan katılımcıların katkılarına değer verdim.					
6.	Bilgilerimi diğer katılımcılarla paylaştım.					
7.	Proje tamamlama sürecinde diğer katılımcıların fikirlerine saygı gösterdim.					
8.	Proje süresince yaratıcı fikirler ürettim.					
9.	Diğer katılımcıların hatalarını bulmaları için yardımcı oldum.					
10.	Web Macerası projesini hiç zorlanmadan tamamladım.					
11.	Web Macerası projesi, diğer katılımcılarla işbirliği yapma isteğimi arttırdı.					

	5	4	3	2	1
12. Web Macerası projesi hayal gücümü kullanmamı sağladı.					
13. Web Macerası, bu derste öğrendiğim kavramları kendi mesleğimde uygulama yeteneğimi arttırdı.					
14. Web Macerasına katılmak beni derse karşı olumlu yönde motive etti.					
15. Web Macerası projesini yapmak, dersle ilgili konuları anlamama yardımcı oldu.					
16. Web Macerası bu dersin öğrenim kazanımlarına ulaşmada etkiliydi.					
17. Proje tabanlı öğrenme, bireysel çalışmaya göre daha verimlidir.					
18. Bu dersin projesini Web destekli yürütmek hoşuma gitti.					

❺ WEB MACERASI HAKKINDA GENEL GÖRÜŞLER

1. Web Macerası projesi sürecinde planlı ve yönlendirilmiş bir şekilde çalışmak sizi nasıl etkiledi? Lütfen görüşlerinizi belirtiniz.

2. Web Macerası projesini yürütürken sorunlarla karşılaştınız mı? Yanıtınız EVET ise, sorunları belirtiniz.

3. Siz de gelecek yaşantınızda öğrencilerinize Web Macerası projeleri hazırlamayı düşünür müsünüz? Lütfen nedenini açıklayınız.

4. Bu projenin sizin gerçek hayatta karşılaşabileceğiniz benzer problemleri çözmenizde yardımcı olacağını düşünüyor musunuz? Neden ve nasıl?

5. Web Macera projesinin en beğendiğiniz 3 özelliği nedir?

6. Web Macera projesinin en beğenmediğiniz 3 özelliği nedir?

7. Sizce Web Macerası sitesine ne eklenirse daha etkili ve kullanışlı olur? Önerilerinizi belirtiniz.

8. Proje tabanlı öğretim yönteminin Web ile desteklenmesi hakkındaki görüşlerinizi belirtiniz.

    a. Öğretim sürecine katkısı açısından:

    b. Diğer:

9. Önceki dönem projeniz, bu dönemki projeniz Web üzerindeydi. İkisi arasında olumlu/olumsuz bulduğunuz yönler nelerdir? Lütfen detaylı bir şekilde belirtiniz.

APPENDIX B

STATIC WEBQUEST PAGES

Static WebQuest pages consist of plain, simple, HTML files having navigation bar on the top, on the left side of the screen or anywhere that instructor conveniently chooses. In order to determine the comparison between static and dynamic WebQuests according the experience of the preservice teacher, a static WebQuest project named "I am preparing a project proposal (Proje Teklifi Hazırlıyorum!)" was designed and implemented to the students enrolled in the course named "Foundations of Distance Education" in the previous semester. The WebQuest project, on which I am preparing a project proposal, has six parts as it is seen in Figure 6.
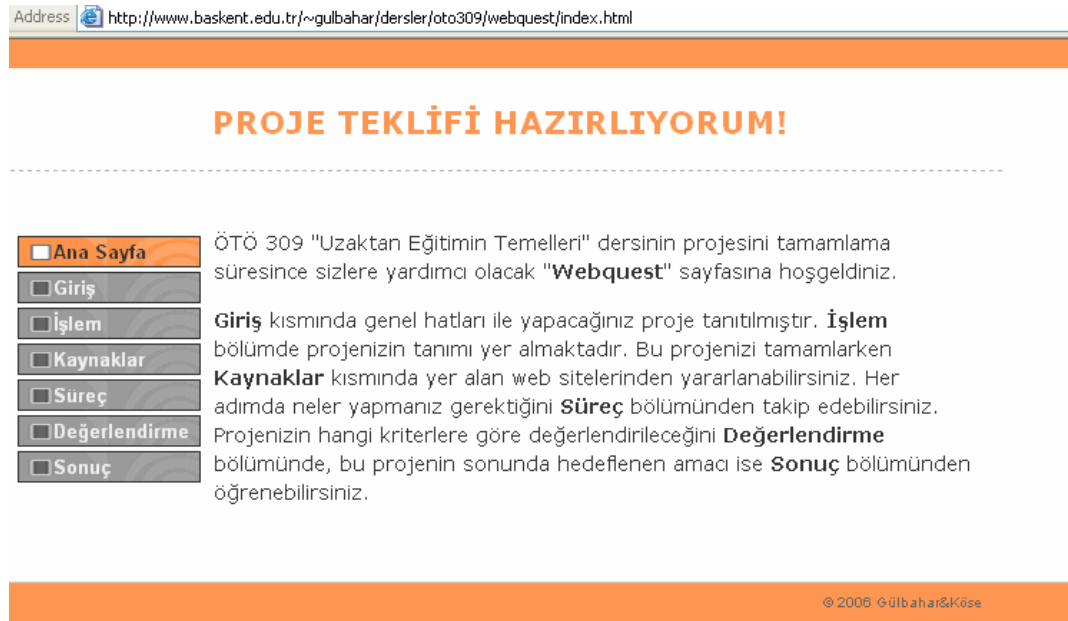
Figure 6 Screenshot of the Static WebQuest

Introduction:

You are in the manager position of the Distance Education Center in a public or private organization. This center is supposed to open a certificate program about an important topic for organization workers. In this WebQuest, you must prepare a "project proposal".

This project proposal includes some tasks to be completed in every week. Every completed step will be sent to upper position in the organization via e-mail and next step will be completed after getting confirmation.

Task:

You need to identify the organization structure, disorganized departments, and personnel profile very well in order to prepare the project proposal. A report consisting of your project profile will be evaluated with other organizations. The organizational information will be kept secret during the evaluation process.

Resources:

- For preparation of the proposals http://econtent.dpt.gov.tr/16.asp
- A sample of project proposal
  http://www.la21turkey.net/_dl/down/yg21/ypdp/asama2/Dalyan.pdf
- Yılmaz, C. & Akça, H. İ. (). Türkiye'de proje planlama ve proje döngüsü
  yönetimi. http://ekutup.dpt.gov.tr/planlama/42nciyil/yilmazc.pdf
- How will a project be prepared?
  http://www.fp6.gazi.edu.tr/projehazirlama.htm
- Documents for the project preparation process
  http://www.fp6.org.tr/web/proje_sunum_ilgili_dokuman.htm

Process:

STEP 1 (5 points):

Form a group: To complete a project, first form a group consisting of three people as project manager, instructional technologist, and education expert.

Identify organizational profile: Identify whom you are working for. Identify your organization name, your mission, your vision, and details about accomplished projects. Determine how many departments inside and outside the country there are, the number of personnel, the division of the labor of the personnel, job specialization according to the departmentalization, job definitions, and demonstrate the organization chart including all details.

Identify education priorities: To identify the education each personnel needs, check the public opinion and investigate the demands.

Identify application conditions: To open a program via distance education and give a certificate, you need to identify all official procedures, documents, where and when to apply.

Including all information, submit a first report in Microsoft Word format (The submission dates: Section-01 (7.12.2006) Section-02 (8.12.2006))

STEP 2 (5 points):

Form a project team. Prepare a detail report including all information about how many people will be assigned, what the job specialization and job definitions will be for each person. (The submission dates: Section-01 (14.12.2006) Section-02 (15.12.2006))

STEP 3 (5 points):

Design the overall system showing interaction among student, content, method, material, media and technology. (The submission dates: Section-01 (21.12.2006) Section-02 (22.12.2006))

Suggestions: System Model for Distance Education, Moore & Kearsly (2004) may be helpful at this point.

STEP 4 (5 points):

Schedule your system in accordance with your project team to actuate it. (With the help of Microsoft Project or similar approach).

Plan your budget within schedule and list your expenses in detail, which will be need to actuate the system

Submit your "Project Proposal" including all steps. (10 points)

(The submission dates: Section-01 (28.12.2006) Section-02 (29.12.2006))

Evaluation:

The evaluation criteria for project proposal

1. In development phase of the project, planning is feasible and task steps are well stated.

2. Project subject is authentic and creative.

3. Project addresses the needs of students.

4. Project, as content, includes all headings, and sub headings.

5. Project provides subject, aim, activities, chosen methods and obtained results.

6. In project, resources are investigated in depth.

7. The language used in the project is comprehensible and influential.

8. Project is prepared within a systematic approach.

9. Project is applicable.

10. The format of the project proposal is in an acceptable quality.

Conclusion:

This project was aimed to inform you about the steps to be completed in distance education and to show you the process of preparation of the project proposal in real-life.

From now on, you can plan the process of distance education easily in an organization. Of course, you will be working with more professional teams that are more crowded. This project was just the initial step to prepare you to the real-life. You have achieved successfully, congratulations!

APPENDIX C

DYNAMIC WEBQUEST PAGES

In this study, a Web site was developed by the researchers for teacher to facilitate teaching, evaluating, and for students to learn, to produce their projects. This site was developed by using PHP and MYSQL technologies to create fields to keep records of students and teachers in the databases.

Before using this site, a passport must be taken to take an adventure. As, it is seen in Figure 7, if the user has no information about the WebQuests, he/she can click on the button of "The Things to Learn about WebQuests (Macera Hakkında Bilmek İstediklerin)" to gather more information and see history of WebQuests, process of designing, adapting WebQuests, and many WebQuests examples in the grade level of primary, secondary and higher education.

Figure 7 Home Page of Web Macerası

If user has problems before taking a passport, he/she can contact with "Central Office (Merkezle Bağlantı)" by writing his/her message with own e-mail address in the site. Without having a passport, nobody can enter the site and utilize the opportunities such as "Signing up a WebQuest (Maceraya Katıl)" and "Create a WebQuest (Macera Yarat)"

To take an adventure, the user has to start procedure of getting a passport by fulfilling a form under the button of "Start Passport Procedure (Pasaport İşlemlerini Başlat)" in figure 8. Then the user has to check his/her e-mail address written in the application form to confirm his/her application. After the site administrator has given an approval to his/her application of getting passport, he/she can enter the site by supplying a user name and password.

Figure 8 Screenshot of Before Signing up a WebQuests

After entering the home page, he/she can navigate through the site by using the buttons at the top-right side of the screen as it is seen in figure 9.

Figure 9 Navigation Bar

The navigation bar has following features:

Home Page (Ana Sayfa): This page consists of a list of WebQuest projects joined as well as greetings to the system.

Create a WebQuest (Macera Yarat): If the mode of login type is "Instructor", instructor can create WebQuest project with the help of definition wizard.

Signing up a WebQuest (Maceraya Katıl): The users can join preexisting WebQuest projects after looking over active WebQuest projects. Moreover, the user can apply more than one project. If WebQuest owner confirms this user's application, then user can only send files to the enrolled projects.

Communication (İletişim): This part is purposely designed to provide communication with the administrator, WebQuest owners by using their e-mail addresses.

Search (Arama): The users can search both WebQuest projects and other users in the site by writing some key words.

Information (Bilgi): The users can manage his/her account, change their passwords, upload their photos to be put into their passports, check system statistics regarding WebQuest projects list, user list, see WebQuests project statistics regarding their own WebQuest projects and enrolled WebQuest projects.

Help (Yardım): This page provides detailed information about the buttons in the navigation bar.

Exit (Çıkış): This page helps users to exit site in a secure way.

If the instructor clicks the button of Create a WebQuest, then screen in Figure 10 comes to the scene. Instructor should give a name to his/her WebQuest that defines it absolutely. Then he/she chooses the start and finish dates by clicking the related text box. The instructor has to determine the key words that fit the definition and content of the WebQuest through which other users will perform a research by using those kinds of key words. As a last step, he/she may write a description of the WebQuest with the help of text editor and must finalize this procedure by clicking on the button named "Create WebQuest (Macera Yarat)".

After completing first step, a screen appears and informs instructor about what to do next. Instructor may not go on completing the creation of the WebQuest or may go on by clicking "Start definition wizard (Tanımlama sihirbazını başlat)" (Figure 10).

Figure 10 Screenshot for Creating a WebQuest Project

Figure 11 Screenshot of Creating a WebQuest Project-2

When wizard starts, the screen with text editor appears and instructor can write description of the each steps of the WebQuest in terms of Introduction, Task, Resources, Process, Evaluation, and Conclusion, respectively. After these procedures, system warns instructor to write detailed information for the process part. In this page, instructor can give names to each task, define time meaning deadline of uploading related files to the system, and define the points of each task. Creating dynamic WebQuest does not end at this point, since there is chance for editing each step whenever instructor wants just by clicking the Information button from the navigation bar (Figure 12).

Figure 12 Screenshot of About WebQuest

As it is seen in Figure 13, the user can change the passport information, update personal information, upload avatars, change password and investigate the users enrolled to site, active WebQuests, own WebQuest, enrolled WebQuests.
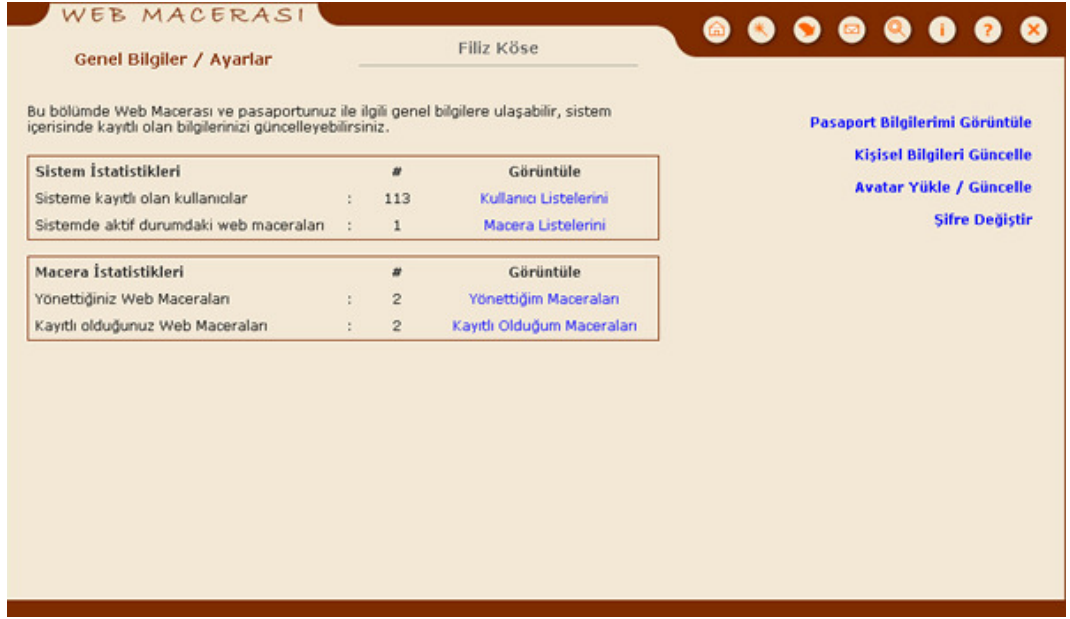
Figure 13 Screenshot of General Information / Settings

When the instructor clicks on the "The WebQuest I Manage (Yönettiğim Maceralar)", he/she is able to reach the own WebQuests and see their status in terms of active or passive related to their date, delete WebQuests, update their information, process details, each step one by one with using wizard (Figure 14). He/she can manage the learners who want to enroll his/her WebQuest by confirming, canceling, or deleting their application in the part of membership. Without any confirmation, the learners cannot upload their files to the related tasks but can view all the steps of the WebQuest.

Figure 14 Screenshot of Updating WebQuest

When any users who want to see his/her passport, a screen in Figure 15 appears. By this way, he/she can see his own detailed information provided for the system.

Figure 15 Screenshot of Passport

When a learner is accepted to the applied WebQuest, he has to complete whatever it requires. Before the deadline of the task, he has to upload his/her files (Figure 16). Otherwise, the task will not accept any files to be uploaded.

Figure 16 Screenshot of Uploading Process

There are some limitations about the uploading procedure. For instance; file format must be in .zip format; the maximum size of the files must not be greater than 2 MB. After uploading by giving the path and confirming this file, the learner must write some information about his/her files. Moreover, the learner can see more information about the file uploaded in terms of size, name, description etc. When the instructor enters the page and looks at the "process" and he/she can click on "evaluate" link and see a list of documents supplied by the learners. After selecting files to grade and write feedback, the screen in the Figure 17 appears.

Figure 17 Screenshot of Writing Feedback to the Learner's File

When the learner enters the process page of the WebQuest to view his/ her feedback and grades, he has to click on the "Status (durum)" button of each task as it is seen in Figure 18.

Figure 18 Screenshot from a Leaner Account