

AN INVESTIGATION OF INDIVIDUAL DIFFERENCE FACTORS
IN ONLINE INSTRUCTION

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF SOCIAL SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN
PSYCHOLOGY

DECEMBER 2006

Approval of the Graduate School of Social Sciences

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ABSTRACT

AN INVESTIGATION OF INDIVIDUAL DIFFERENCE FACTORS IN ONLINE INSTRUCTION

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December 2006, 132 pages

This thesis study analyzed the individual difference factors affecting the success of online instruction. The factors that were examined are mastery goal orientation, learning self efficacy, and conscientiousness. The success of online instruction was examined in terms of the knowledge and skill acquisition during training, the practice level, and program completion rate. To investigate the effects of the hypothesized factors, an online instruction program on time management, fast and effective reading, and memory skills was developed and administered to a sample of college students. Results showed that the developed online instruction program improved time management knowledge and fast reading skills of participants. Additionally, conscientiousness was found to predict the program completion rate. On the other hand, results failed to support the suggestions that mastery goal orientation would predict the undertaken practice level and the improvements in knowledge and skill levels. The proposed predictive relationships between learning self-efficacy and practice level as well as between conscientiousness and practice level were not supported either. Finally, the claim that completing the training program would improve the learning self efficacy of the participants was not supported.

Keywords: Online Instruction, Individual Difference Factors, Time Management, Fast and Effective Reading, Memory Skills

ÖZ

İNTERNETE DAYALI EĞİTİMDE KİŞİSEL FARKLILIK ETMENLERİNİN İNCELENMESİ

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Yüksek Lisans, Psikoloji Bölümü

Tez Yöneticisi : Doç. Dr. H. Canan Sümer

Aralık 2006, 132 sayfa

Bu tez çalışması, internete dayalı eğitimin başarısını etkileyen kişisel farklılık etmenlerini incelemiştir. İncelenen faktörler, öğrenme yönelimi, öğrenme öz-yeterliği ve sorumluluk bilincidir. İnternete dayalı eğitimin başarısı, bilgi ve beceri kazanımı, alıştırmaları yapma oranı ve program tamamlanma oranı temelinde incelenmiştir. Öne sürülen etmenlerin etkilerini incelemek için zaman yönetimi, hızlı ve etkili okuma ve bellek kullanma konularında internete dayalı bir eğitim programı geliştirilmiş ve üniversite öğrencilerinden oluşan bir örnekleme uygulanmıştır. Sonuçlar, geliştirilen eğitim programının katılımcıların zaman yönetimi ve hızlı okuma becerilerini geliştirdiğini göstermektedir. Buna ek olarak, sorumluluk bilinci, programın tamamlanma oranını yordadığı bulunmuştur. Buna karşılık, sonuçlar, öğrenme yöneliminin yapılan alıştırma düzeyi ve bilgi ve beceri düzeylerindeki değişimi yordayacağı öngörüsünü desteklememiştir. Öğrenme öz yeterliğiyle alıştırma düzeyi ve sorumluluk bilinciyle alıştırma düzeyi arasında olacağı öne sürülen yordayıcı ilişkiler de desteklenmemiştir. Son olarak, programı tamamlamanın katılımcıların öğrenme öz yeterliği üzerinde olumlu bir etki yapacağı beklentisi gerçekleşmemiştir.

Anahtar kelimeler: İnternete Dayalı Eğitim, Kişisel Farklılık Etmenleri, Zaman Yönetimi, Hızlı ve Etkili Okuma, Bellek Kullanma Becerileri

To my family

ACKNOWLEDGMENTS

The author wishes to express his deepest gratitude to his supervisor Assoc. Prof. Dr. H. Canan SÜMER for her invaluable guidance, criticism, encouragements and patience.

The author would also like to thank Assoc. Prof. Dr. Reyhan BİLGİÇ and Assoc. Prof. Dr. Kürşat ÇAĞILTAY for their valuable suggestions and comments.

The author is thankful to Alev DEMOKAN and Pınar BIÇAKSIZ for their fantastic support in the development of the training program.

This study was supported by the Middle East Technical University (METU) Grant No: BAP-2006-07-03-00-10.

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CHAPTER 1

INTRODUCTION

1.1. Overview

This study is carried out to investigate several individual difference factors affecting the success of online instruction. Its aim was to examine these factors by providing an online instruction program to university students. Since the study is about online instruction, a brief introduction about online instruction is provided in the following part.

Online instruction, e-learning, online training, asynchronous/synchronous learning, distant education, and web-based degree programs are some of the most popular terms recently being used in instructional and technological contexts. All of these terms are some times covered by e-learning alone. Although it will be used to refer to a subgroup of these instructional concepts in latter parts of this text, in this section the term e-learning is used to refer to all relevant terms. The popularity of e-learning programs is based on their novelty and the potential improvements over the traditional methods/techniques of learning they promise. Some forms of such modern instructional methods are already in use. Some universities are providing degree programs over Internet (e.g., Harbeck, 2001, for more examples, <http://www.petersons.com/distancelearning/code/search.asp> or <http://www.geteducated.com/featured/featured.asp> can be visited). Despite its increasing popularity, however, scientific research on e-learning was considered to be scarce (Brown, 2001). Yet, the number of studies on e-learning is increasing rapidly as more and more attention is drawn to the area (e.g., Buckley, 2003; Butler, 2004; Carter, 2004; Doo, 2004; Fitzgerald, 2003; Harbeck, 2001; Johnson, 2003; Juarez, 2003; Singh, 2002; Woods 2004).

Studies on e-learning focus either on technological or instructional basis of the program, or on both aspects of e-learning. Whatever the focus, usually the main aim of the studies is to determine the factors affecting the effectiveness of such programs. Current study's aim was to determine the effects of mainly

individual differences of the learners on success of such programs. More specifically, the study aimed to investigate the effects of goal orientation, conscientiousness, and learning self-efficacy, on outcomes of online instruction (i.e., behavior/skill demonstration, knowledge, practice level, and completion rate). To investigate the effects of these factors, a training program on becoming an effective learner was developed and applied in Middle East Technical University (METU).

This study aimed to examine online training because of two main reasons. First reason is that it has the potential to revolutionize the training concept itself with the features already mentioned. It enables a broader number of learners to have the chance to get the training independent of their location. It completely changes the learning environment, including but not limited to the reduction of the need for instructor support, the provision of immediate feedback, a great degree of individualization, improved reusability, and inclusion of new ways of interaction to the program. Secondly, scientific research on the topic is still scarce. Brown (2001) states that much of the research in this area is atheoretical and concerned with the technological side of the training. Moreover, the area is growing at a rapid rate and more research is required to investigate the changes or the developments in the technological side will bring to the training arena.

Before delving any deeper into the study, it may be appropriate to note that certain terms are used interchangeably in this paper. For example, Clark (1995) distinguishes between training, education, and development. In a similar way, learner and student may be separated. However, no such distinctions are made here, because for the purposes of the current study, the fact that a “participant” is acquiring new skills or knowledge is the main focus. Therefore, the terms training, development, education, and also instruction are used interchangeably. Similarly, student, trainee, and learner are used interchangeably.

In the following sections, information about the training program and the sample of current study are provided. Following that, general information regarding online instruction, instructional design, and instructional software design is presented. Next, the individual difference factors that have been investigated in the current study for their effects on the success of online instruction are introduced. Finally, the outcome variables and the hypotheses are presented.

1.2. Training Program: How to be an Effective Learner

Current study involved development of a training program that aims to support college students in becoming more effective learners. The training program has the motto “Learn to learn” and involves three modules. These modules contain instruction related to fast and effective reading, planning and time management, and better use of memory and retention techniques. The importance of time management is emphasized in many books related to increasing academic success (e.g., Casey, 1991; Feldman, 2003; Frank, 2003; Zimmerman, Bonner, & Kovach, 1996) as well as student success support sites (e.g., Muskingum College – Center for Advancement and Learning; Learning Skills Program York University). Zimmerman et al. (1996) state such phrases as “I can’t get my homework get done on time, and I always have to cram for tests” (p.17) as indicators of poor time management. Through examples, the authors also propose that increase in this skill can increase the grasp of the learning material, test scores, and the self-efficacy perceptions of students. Similar to Zimmerman et al., Casey (1991) relates the phrases “there doesn’t seem to be enough time” and “I just can’t meet the deadlines; the work keeps piling up” (p. 11) to poor planning and time management. Casey suggests that adopting and maintaining a planned approach will help the student keep on top of work, meet deadlines and still have more time left for other things. Pages of Learning Skills Program of York University suggest that “all other things being held constant, better time management skills can improve students’ grades, help students keep stress in check, and help them be competitive in the career they undertake following their university education” (<http://www.yorku.ca/cdc/lsp/tmonline/tm1.htm>). Additionally, Frank (2003) claims that “the most successful people, including the most successful students, are usually ardent list-makers and schedule-keepers” (p. 50).

However, according to Muskingum College’s Center for Advancement and Learning (CAL) Learning Strategies Database, setting aside time for studying is not enough to study (<http://www.muskingum.edu/~cal/database/general/time.html>) i.e.; it is necessary to plan for study. Therefore, developing time-management and planning skills is important. Zimmerman et al. (1996) point out that, time management skills and other skills related to learning, including text

comprehension and summarizing, are usually not well-developed or used efficiently by students, and will be seldom effective unless implemented through a systematic approach.

Zimmerman et al. (1996) emphasize the importance of reading skills along with time management. They state that students need to become proficient in understanding text because much school learning (especially college) is achieved through reading. Casey (1991) claims that few people read efficiently, and most people do not have the necessary arsenal of different reading approaches required for different kinds of materials. The author also states that “real secret of rapid reading is to *train* (emphasis added) your eyes to *see more* (emphasis in original)” (p. 23). Waldman (1972) also suggests that almost no one, including the exceptionally good readers, attains her/his full potential in reading. Frank (2003) claim that ordinary reading skills will not be enough in today’s world because of large amount of information to be assimilated in a small amount of time. The author also proposes that “the superior student” is capable of reading the material quickly and understand thoroughly what has been read. Pages of Learning Skills Program of York University note that reading becomes the main activity in college and or university learning (<http://www.yorku.ca/cdc/lsp/readigonline/read2.htm>).

Several sources emphasize the importance of improving remembering and memory (e.g., Casey, 1991; Neath, 1998; Muskingum College’s CAL-Learning Strategies Database, <http://www.muskingum.edu/%7Ecal/database/index.html>). Casey states that understanding and memory retention may degrade over time. The author gives an estimation that proposes 75% of learned material to be forgotten only after twenty-four hours if no precaution is taken. Muskingum College’s CAL-Learning Strategies Database provides similar results of a study by Spitzer showing that as much as 46% of text-book material may be forgotten after only 1 day. This ratio rises to 65% in 7 days, and to 81% in 28 days. On the same page, in the Advantages of Memory Strategies section, it is also stated that “because memory skills cross-cut most academic tasks, proficiency in this area can have a profound, positive impact on academic performance. One of the most obvious areas in which this is the case is taking exams. However, performance on other, less obvious tasks may be improved with memory strategies: note-taking, reading comprehension, and problem solving” (<http://www.muskingum.edu/~cal/>

database/general/memory.html). As a result, it can be assumed that improving memory skills will have positive effects on academic success. Neath, suggests that it is possible to improve these skills, and claims that many of the suggestions in popular books for improving memory do work.

Based on the reviewed literature, it can be claimed that it is possible to improve time management and planning, reading, and memory skills; and improving these skills will have positive effects on academic success.

1.3. Online Instruction

Online instruction is a type of computer aided instruction. Although online instruction is generally used to include training programs deployed on CD-ROMS, over local area networks or Internet; for this study, online instruction is used to cover training programs deployed over networks, especially Internet. More information on online instruction will be provided after briefly introducing *programmed instruction*, *personalized system of instruction*, and *computer aided instruction* to show the path which led to online instruction's development. However, before presenting these instructional techniques, learning theories will be discussed briefly to lay the basis for the upcoming material.

1.3.1. Learning Theories

Three basic theories underlying learning are behaviorism, cognitivism, and constructivism. The theories are actually very broad; however, they are presented briefly here. It is important to note that these theories are not directly examined, compared or contrasted in the present study. They build the basis for the instructional models reviewed in the later sections of the introduction.

1.3.1.1. Behaviorism

As the name implies, behaviorism investigates behavior and observable changes in behavior. The main aim of behaviorism is to explain and to manipulate such changes. The most important tool of behaviorism in the learning setting is the application of reinforcement. According to Skinner (1974), "when a bit of behavior has the kind of consequence called reinforcing, it is more likely to occur again" (p. 46). Reinforcement is used as the basis for operant conditioning; aiming

to shape the operant, the subject exposed to the stimulus, to respond in a certain way. Reinforcement schedules are used for the most effective application of operant conditioning to achieve observable behavioral change. It has been found that variable interval (i.e., providing reinforcement after varying time intervals) and variable ratio (i.e., providing reinforcement after varying number of successful responses) schedules produce the best results, variable ratio being the superior (Latham & Dosset, 1978). Behaviorism also supports separating the learning material into smaller and easier parts. These two important characteristics - reinforcement and learning in smaller parts - is the basic approach underlying programmed instruction (Mergel, 1998).

1.3.1.2. Cognitivism

Beginning in the 1920's, limitations in the capability of behaviorism in explaining learning was seen (Mergel, 1998). For example, it could not clarify why some behaviors were not replicated even if they were reinforced. These limitations led some researchers to conduct more studies and come up with cognitivism. Mergel (1998) includes the following definition of cognitivism: "Cognitive theorists recognize that much learning involves associations established through contiguity and repetition. They also acknowledge the importance of reinforcement, although they stress its role in providing feedback about the correctness of responses over its role as a motivator. However, even while accepting such behavioristic concepts, cognitive theorists view learning as involving the acquisition or reorganization of the cognitive structures through which humans process and store information" (p. 8). Cognitivism had the important benefit of taking the internal processes of the learner into account. This increased the recognition of individual differences.

1.3.1.3. Constructivism

According to Maschke (1999a), the constructivist theory of learning is a direct result of cognitivist theories. Jonassen (1994) states that: "Constructivism avers that learners construct their own reality or at least interpret it based upon their perceptions of experiences, so an individual's knowledge is a function of

one's prior experiences, mental structures, and beliefs that are used to interpret objects and events” (p. 34).

In terms of instructional activities, constructivism tries to bring the learner to a state where s/he is able to develop her/his interpretation of a given problem. As such, it takes the responsibility from the instructor to teach and gives the learner the responsibility to learn. It starts with focusing on a task from the learners' experiences and provides tools for investigating problem to gain a deep understanding of the problem and to construct solutions. Testing is not a separate activity because successful completion of the activity is considered as demonstration of successful learning. Important point is for the students to be able to build their own interpretations and construct or reconstruct solutions, not simply to possess (or store) knowledge. Since the instruction begins with a real task, the learning provides useable knowledge.

After briefly reviewing these learning theories, instructional techniques, specifically, *programmed instruction*, *personalized system of instruction*, *computer aided instruction*, and *online instruction* will be briefly introduced in the following sections.

1.3.2. *Programmed Instruction (PI)*

PI is generally used to refer to learning material such as automated teaching machines, self-instructional materials, and programmed texts (Goldstein, 1993). It is based on behaviorist approach and uses the principles of reinforcement. Programmed materials present the content in a systematic fashion to the user and try to exploit reinforcement for learning. Some early programmed instruction materials were developed at the beginning of the 20th century.

Goldstein (1993) separates PI into three groups: *auto-instructional method*, *linear programming*, and *intrinsic/branching programming*. *Auto-instructional method* is based on Thorndike's law of effect, which states that “Of several responses made to the same situation, those which are accompanied or closely followed by satisfaction to the animal will, other things being equal, be more firmly connected with the situation, so that, when it recurs, they will be more likely to recur” (cited in Nevin, 1999, p. 447). One of the mostly cited early works in PI area is the auto-instructional program by Pressey (e.g., Goldstein, 1993;

Mergel, 1998). The program was based on a multiple-choice machine enabling immediately scored exams to be applied. This provided the necessary immediate satisfying or unsatisfying state of affairs. However, it was argued that this machine was only a testing tool and did not provide systematic programming of materials. At this stage, PI was not favored much. With the development of *linear programming*, PI received more favorable reactions and got a wider area of application. According to Goldstein (1993), *linear programming* is based on the claim by Skinner that “a program could successively shape the learner by reinforcing the achievements of small steps” (p. 235). That is, if every small step towards learning the material is reinforced, the learner will move toward the desired end result step by step. An important point which should be noted is that this kind of instruction needs to be designed in a way which almost eliminates any errors by the learner by providing her/him successive small steps which are easy to complete. Actually, according to Goldstein, if errors are made at a particular point in the program, it is likely that there is a problem with the program, not the student. This is because Skinner believed that positive reinforcement of correct responses is the most efficient way to produce learning.

Intrinsic/branching programming is an improvement over linear programming (Driscoll, 2002). Instead of providing small steps, which leave almost no space for errors, intrinsic programming provides larger steps and allows for errors. In case of an error, the learner is directed to remedial material which is designed to correct the mistake and help the student learn the material. In case of a correct answer, the student is led to the next step. The remedial material can be designed as another branching program with smaller steps. The greatest improvement over linear programming is the ability to individualize the program through the design of the steps.

The major problem with programmed instruction is limited applicability (e.g., most feasible for factual materials) and the labor and cost involved in developing the program and keeping it up to date. Additionally, it has been found that the reduced chance of failure and oversimplification leads students to pay less attention and to get bored (McDonald, Yanchar, & Osguthorpe, 2005). Despite its shortcomings, programmed instruction has been an important waypoint in the development of the computer aided instruction.

1.3.3. *Personalized System of Instruction (PSI)*

Mergel (1998) names a group of methods called *individualized approaches to instruction*. The common characteristics of these methods are that they aim to shape the learning experience according to the needs of the learner and they use prepared material for the instruction. The most often cited of these methods is the PSI or Keller Plan as it is usually called (e.g., Grant & Spencer, 2003; Mergel, 1998). PSI has five major underlying factors: stress on the written word, unit mastery requirement, student self-pacing, use of proctors, and use of lectures and demonstrations as motivational devices (Grant & Spencer 2003). In a PSI course, material is presented in written form instead of lectures. Instructor usually prepares a study guide which contains information about the expectations from students and focus students' attention on important material. Mastery is usually defined as achieving a predetermined score on a test or quiz. Before students can advance from one unit to the next, they need to show that they have mastered the unit. Different from the usual learning experience, learners take tests or quizzes until they master the material. The individual pacing opportunity comes from the mastery learning approach. Since each learner achieves mastery in a different amount of time, they progress at different paces. Another important feature is the use of proctors, who provides support to the students, including immediate feedback on the exams and tutoring. The last component, use of lectures and demonstrations as motivational devices, has not been shown to increase academic performance.

1.3.4. *Computer Aided/Assisted Instruction (CAI)*

CAI is a relatively new method. It is sometimes also referred to as computer-based instruction (CBT). It grew rapidly during the 1960's. However, the most important developments took place in the recent years. According to Goldstein (1993), at the beginning, the possibilities were limited because of the software availability and capabilities of the hardware. The recent advancements in the information technologies (IT) area increased the use of computers in training. Especially great improvements in software technology, wider availability of computer workstations, rapid increases in storage and processing capabilities made their use for any purpose, including training, more practical and easy. Higher

levels of interactivity, usage of higher quality audio and video resources increased the quality of the training materials produced for CAI systems (Driscoll, 2002).

CAI has increased the possibilities for branching programming by allowing almost infinite number of branches and enabled higher levels of individualization. It provides the possibilities for complete self-pacing and advanced branching. Since the computer can provide all training materials, almost all tests and evaluations of these tests (given that the software is appropriately developed) the need for proctors for providing tutoring, grading and evaluation of exams are all reduced, and learners can proceed at their preferred speed, take the tests when they feel most appropriate, and can correct their errors by using the feedback provided by the instructional program. Advanced branching gives the capability to tailor the program to each individual's idiosyncratic needs. Learners can skip material they already know, get prerequisite knowledge by referring to resources provided or recommended by the program, go back to the appropriate part of the program to remedy their knowledge or increase retention and so on. However, these are not inherent characteristics of all developed CAI systems but only possibilities to be included. Actually, a CAI program presenting only the information in a systematic fashion and giving simple feedback is only a sophisticated PI program. To make the CAI program go beyond PI, it is necessary to utilize its potential for individualization, advanced branching, and use of high quality media as much as possible. Developing a highly effective CAI program integrating these features requires sound instructional and technological bases and much effort.

It is clear that any instructional effort needs to be carefully planned, designed and implemented to be successful. This requires qualified effort in all cases; however, this effort is increased with CAI because the development of computerized instruction requires more than designing the instruction. It also involves the integration of the instruction to the computer environment, making the content appropriate for the features of CAI mentioned above, and beyond these it requires the development of the software. The last step is usually beyond the grip of instructional designers and requires support from software designers and developers. This increases the required effort and cost for the development of CAI programs. This was and still is one of the most prominent drawbacks of CAI; however, with the experience growing in this area and efforts put in making the

training programs reusable with little change, the costs are declining and CAI is becoming more applicable.

1.3.5. Online Instruction

Online instruction is not actually a method in its own but it's a special kind of CAI which can be combined with some other methods (e.g., classroom lectures through online conferences). It is sometimes used to refer to instructional programs deployed on CD-ROM's (and, actually, any instruction taking place after the user "logs on" to a computer); however, this is not considered online instruction in this paper. Online instruction for the purposes of this study refers to instructional program deployed over networks including local area networks (LAN), wide area networks (WAN) and especially the Internet. This kind of instruction is also called e-learning in some contexts. Though e-learning may simply refer to lower levels of CAI, the terms starting with "e" are generally used for electronic resources available through networks. A distinction between synchronous and asynchronous e-learning can be made. Singh (2002) gives the definitions as follows:

Synchronous e-learning: Learning is mainly under the guidance of an instructor, although students and the instructor might be geographically dispersed. Students have a predetermined time for such type of learning (e.g., video conferencing, web seminars, etc.)

Asynchronous e-learning: A learner can take the course at anytime and anywhere he/she has access to the Internet. Interaction between teachers and students occurs intermittently with a time delay (p. 2).

The aim of the current study was to investigate factors affecting the success of asynchronous e-learning. Online training or online instruction is used to refer to this kind of instruction unless noted otherwise. Since it is mainly based on Internet, it is sensible to note the importance of Internet for instruction. Internet has made it possible for instructional programs to be reachable from almost anywhere with a computer and Internet connection. This created several opportunities for decreases in training costs thus increasing the popularity of computerized instruction methods. One of the most prevalent uses of online training is creating a program for training personnel and then deploying it over the network (Internet or company

intranet). This application of online training is especially preferred by multinational corporations. Usage of networks reduced the training costs considerably because it enabled the development of training at one location by an expert and then using it all around the world, without requiring the trainers and the learners to travel, causing great down time, or necessitating physical learning materials to be distributed to several different locations.

Distance learning is also a popular application of online instruction, used by universities or colleges. For example, Virginia Community College System (VCCS) offered a total of 1587 web based courses (<http://www.so.cc.va.us/vccsonline/directoryindex.html>) and 40 complete distance learning programs in Fall 2004 (<http://www.so.cc.va.us/vccsonline/Dlprograms.htm>).

Online training has become so popular because of several factors. First, it enables “distribution” of the instruction to a larger audience with a reduced cost, thus increasing the reusability of the material. Second, it enables interaction between the instructor and the learners who could be located at different places. Third, it creates an opportunity for those who are not able to receive training due to certain limitations (e.g., time or location constraints). Fourth, it incorporates the potential of CAI for high individualization. Fifth, with improvements in the network infrastructure all over the world and the advancements in audio, video and interactive software technologies, online training now provides the medium which can be used to deliver highly sophisticated instruction programs which were not available in the past. Sixth, with the developments in the communication technologies, online instruction can incorporate a global conference with virtually thousands of participants or a *face to face* lecture, for example, with learners from different countries of Europe and an instructor from a country in Asia.

Online training may be considered to be comprised of two main components in accordance with its name: the “online” part and the “training” part. As the name makes it obvious, independent of the transfer medium or independent of the employed methods, it is still a form of training. As such, components of online training are welded together by application of sound instructional principles. Therefore, instructional design lays the basis for online training. Thus, any study examining success of online training will contain instructional design in some form. It may be included as a major item being investigated to determine its effects

on the success of the training. However, it is also possible that instructional design is not explicitly considered for its effects on the success of the training. In such cases, (i.e., where the effects of the instructional design are not particularly investigated), the instructional design is still involved in the training, because without it there can not be instruction. Instructional design is inevitably embedded in the training because the development of any training program is an application of instructional design.

The other component, “online”, is also important because it delivers the training to the end users. Even if the training is designed perfectly, (based on principles of effective instruction), if it is not applied properly, if no user benefits from the training, it is useless. Therefore, the “online” component can be regarded as the embodiment of the conceptual design. The material to be learned and the whole instructional design come alive by its application through this medium. Therefore, “online” may be considered as the mold the “training” is poured into.

The presentation of the training or instruction part and the online or the software part separately may suggest that they are actually separate or make one to believe that it is easy to draw a border between them. In reality, however, this is not the case. The software is highly interwoven with the instruction. Therefore, the distinction is not a solid one. It is only to provide a basic understanding of the two components constituting online training. Because of their highly combined nature, they are further examined together under the “instructional software design” section.

Besides the aforementioned two components of online training, there is another critical part or component, which is the “trainee” or the “learner.” The trainee is an inherent part of any training program and also an inherent part of any online application because without users the application has no value. Therefore, it may be seen as included in the “online” part or the “training” part; however, in this study the trainee is treated as a separate component, because the individual differences of learners are also under examination.

The following section deals with instructional design, which is the basis of the “training” component of online training.

1.4. Instructional Design

The word design in instructional design is actually used to refer to development of the instruction, because “it includes prior analysis, the design, delivery considerations (like suitable media) and later evaluation” (Bostock, 1996). The instructional design models presented here include these steps (i.e., analysis, design, delivery, and evaluation) even if the evaluation is implicit in most cases. The chosen models are the ones which are recommended for the development of online course design (e.g., Wiley, 2000). In the following part, Gagné’s Conditions of Learning (Maschke, 1999b), Merrill’s 5 Star Instruction (Merrill, 2000), and Van Merriënboer, Clark, and De Croock’s 4C/ID models (Van Merriënboer et al., 2002) are introduced and their application in the present study is explained. Some other models or blueprints by Wiley (2000), Armani, Botturi, Cantoni, Di Benedetto, and Garzotto (2004), Govindasamy (2002) are discussed in the next section because of their inherent relation with computer based design.

1.4.1. Conditions of Learning

Maschke (1999b) cites Gagné’s view of instruction as “the arrangement of external events to activate and support the internal processes of learning” (p. 1). His model is built around this notion and contains instructional events which are arranged to create the conditions of learning in order to achieve learning outcomes. These instructional events, conditions of learning, and learning outcomes are the major components of his model. According to Tsang-Kosma (1999), conditions of learning are the various sets of observable circumstances that can be set up for learning to occur.

The term “learning conditions” stems from the belief that different outcomes require different conditions for learning (Tsang-Kosma, 1999). Gagné’s model contains eight conditions of learning. These conditions can be seen as an increasingly complex hierarchy of the level of learning. According to Tsang-Kosma (1999), at the first level, the individual learns to make a general response to a signal similar to the classical conditioned Pavlovian response (*signal learning*). At the second level, the learner acquires a precise response to a discriminated stimulus (*stimulus-response learning*). A chain of two or more stimulus-response connections is acquired at the third level (*chaining*). Fourth level includes the

learning of chains that are verbal (*verbal association*). At the fifth level, the individual learns to make different identifying response to many different stimuli, which may resemble each other in physical appearance (*discrimination learning*). At the sixth level, the learner acquires a capability of making a common response to a class of stimuli (*concept learning*). The seventh level is *rule learning* where a rule is a chain of two or more concepts. The last level is *problem solving* which is a kind of learning that requires thinking.

Instructional events are “specific functions of communication behaviors that Gagné identified as components of instruction” (Maschke, 1999b); they are communication behaviors used to accomplish specific instructional aims. They connect the internal processes taking place to external events and thus contain both internal and external processes or events. There are nine instructional events divided into two groups. The five events in the first group take place before knowledge is acquired. These events are (1) gaining and maintaining attention, (2) informing the learner of the objectives, (3) stimulating recall of prior knowledge, (4) presenting the stimulus material, and (5) providing learning guidance. The remaining four events in the second group take place after knowledge is acquired. These are, (6) eliciting performance, (7) providing feedback on performance, (8) assessing performance, and (9) enhancing retention and promoting transfer. The importance of these events is that they provide the list of necessary instructional activities and their sequencing (Goldstein, 1993).

Gagné’s (cited in Maschke, 1999b) model divides the capabilities or outcomes possible as a result of learning into five categories: attitudes, verbal information, intellectual skills, cognitive strategies, and psychomotor skills. These are also called performance categories and may be identified by asking how the learning could be demonstrated (Bostock, 1996). According to Gagné, learning outcomes do “not only differ in the human performances they make possible, they also differ in the conditions most favorable for their learning” (cited in Maschke, 1999b). The first four performance categories are more related to current study, since the training does not include information related to any psychomotor skill. The training program developed in the current study is expected to result in attitudinal changes (e.g., attitude towards using time for studying), require learners to acquire verbal information (e.g., mnemonic techniques), improve intellectual

skills (e.g., improved reading comprehension), and/or help the learners change their current cognitive strategies or develop new cognitive strategies (e.g., planning for studying and applying the plan). However, psychomotor skills are not targeted by the current study.

Gagné's model (cited in Goldstein, 1993) provided the framework in structuring the training program of the current study. Specifically, based on Gagné's model, the desired outcomes of the current training fall into the outcome categories of intellectual skills and cognitive strategies. The desired level of outcome (success) for these goals are mainly rule learning and problem solving in terms of Gagné's conditions of learning.

Finally, instructional events to be used in the present training program were built based on these desired outcomes and their levels. Gaining the attention of the participants was accomplished by using attractive titles in the training program (e.g., "Time Robbers"). To maintain attention, questions and practices were included in the training. Furthermore, objectives of the training were presented at the beginning of each module. Recall of prior knowledge was stimulated by giving tests before each module, which included questions and practice items regarding related knowledge before the relevant material was introduced/presented. After the completion of certain parts, practice exercises were used to elicit performance. These exercise were intended to provide prompt feedback on the performance. For example, the exercises in the fast reading part immediately showed the learner, how far s/he advanced, how many correct answer s/he gave etc. Post-tests were applied to assess performance. Additionally, in order to enhance retention and promote transfer, ways for applying the presented information into daily life of the participant were presented, or complete practice exercises mimicking real life applications were provided.

1.4.2. 5-Star Instruction

5 Star Instruction, as presented by M. David Merrill in his paper titled "First Principles of Instruction" (2000) and a video presentation titled "5 Star Instruction" (2004), is not an actual design model. Rather, it aims to uncover underlying principles common for many instructional design models. Merrill calls

these principles the “First Principles of Instruction” and claims that such principles exist and that these principles can be found in most instructional design models.

According to Merrill (2000), there are Five First Principles of Instruction – hence the name Five Star Instruction- and these principles are implicitly or explicitly employed by many current instructional models. These principles specify the characteristics of effective instructional designs. The first principle is that such designs need to be based on real-life problems. The second principle is that prior experience of the learner should be activated. The third principle states that skills to be learned should be demonstrated. The fourth principle is that opportunities for application of the learned skills should be provided. The final principle emphasizes the need for integrating these skills into the real world activities. The first principle gives the starting point of the 5 Star instructional design. The remaining four principles define the phases at which such a design involves the student. These phases are in the following order: activation of prior experience, demonstration of skills, application of skills, and integration of these skills into the real-world activities.

Merrill (2000) proposes that the first principles of instruction should and do have three main attributes. “First, learning from a given program will be facilitated in direct proportion to its implementation of first principles. Second, first principles of instruction can be implemented in any delivery system or using any instructional architecture. Third, first principles of instruction are design oriented rather than learning oriented. They relate to creating learning environments and products rather than describing how learners acquire knowledge and skill from these environments or products” (p. 1).

The first of these five principles states that instructional development should start with defining a real life problem. Merrill (2000, 2004) gives several uses of problem-based instruction for effective learning. According to him, showing the learners the task they will be able to do or the problem they will be able to solve as a result of completing a module or course fosters learning. Letting learners solve of increasingly complex problems is also important. Therefore, the starting point for instructional design is building it around increasingly difficult real life problems.

The second principle, activation, aims linking any relevant information or experience the learner has accumulated to the contents of the instruction. Specifically, it refers to the activation of the relevant parts of the cognitive structure of the learner. It is stated that learners can activate relevant experience by demonstrating it. Therefore, providing an opportunity to the learners for such demonstration is expected to be beneficial for learning.

The third principle, demonstration, is showing the actual material to be learned. Demonstration is important for Merrill (2000, 2004), because it facilitates learning better than simply conveying information about what is to be learned. He also emphasizes the importance of examples for showing material to be learned over generalities. It is claimed by Merrill that it is necessary for the student to apply the newly acquired knowledge to learn it properly. Therefore, it is important for the program to provide opportunities for the application of this knowledge. Additionally, Merrill advises using a sequence of varied problems for providing the best opportunity for application. Assessing performance is labeled as posttest by Merrill, and it is suggested that application (practice) and posttest should be consistent with the objectives of learning.

Finally, for the instruction to be of the highest possible value, it is necessary that what has been learned is transferred to daily life of the learner. If the newly acquired knowledge is not integrated to their real life applications, then all the effort put in the training program is wasted. Merrill (2004) states that encouraging learners to integrate the new knowledge or skill into their everyday life facilitates learning. Therefore, it is important that the students have a chance to start the integration. Thus, providing the necessary conditions and support for the application of the newly learned knowledge or skills to personal environment of the learners is a necessary step that should be planned ahead and implemented by the instructional design rather than be left to occur spontaneously.

To sum up, Merrill (2000, 2004) suggests for any instructional model to have five basic components the first being problem-based orientation and the others being four phases of instruction: activation, demonstration, application, and integration. Merrill asserts that any effective instructional model needs to have these five components.

The 5 first principles of learning are important for current study because of their mentioned attributes – facilitation of learning, applicability to any medium, and design orientation. More specifically, there are three reasons for using these principles in the current study. First, application of these five principles can improve the effectiveness of the training program. Second, they can be applied to online instruction. Third, they can guide the design. Therefore, these principles are used for guidance in the development of the training program of the current study.

The training program in the current study was based around real-life challenges faced by the learners, such as preparing for an exam; relevant prior knowledge and experience of learners (e.g., problems experienced in time management) were activated by asking questions and giving examples resembling real life cases; and the skills to be learned were demonstrated using appropriate materials, for example by showing an example time tracking sheet; the learner had the chance to apply the newly acquired skills through completing exercises (e.g., reading exercises); and finally, the program provided means for integrating the knowledge to daily life of the learners, for example, by providing guidelines for using the skills in real-life situations.

1.4.3. 4-Component Instructional Design (4C/ID)

The basic claim of Van Merriënboer et al. (2002) is that any environment which fosters complex learning can be described or designed in terms of four interrelated components. Before presenting these four components, it is appropriate to provide information on what Van Merriënboer and colleagues mean by complex learning. Complex learning deals with coordination and integration of separate skills that constitute performance of a real-life task. Therefore, complex learning is beyond learning the individual parts and combining them together because it also involves the ability to coordinate and integrate those parts. Consequently, Van Merriënboer et al. (2002) claim that a training program for complex learning should target to bring the learners to a state where they can use the constituent skills in a coordinated and integrated fashion instead of trying to direct the learners to acquire the skills independently.

Van Merriënboer and colleagues (2002) define a skills hierarchy for the constituent skills. The skills on a lower level on this hierarchy are children of a

skill at the higher level. This indicates that the child skills enable or are prerequisites for learning and performance of the parent skill. An important characteristic of constituent skills extracted by analyzing this hierarchy is consistency or recurrence. The skills are either recurrent –performed in a highly consistent manner from problem to problem- or non-recurrent –the way they are performed varies from problem to problem.

Van Merriënboer et al. (2002) distinguish between learning processes for recurrent and non-recurrent types of skills. For non-recurrent skills, the main process should be schema construction. The suggestion for practice is then to start with concrete experiences and examples and to lead the learners to the abstract generalities. For recurrent skills, the main aim should be rule automation. Rule automation starts with rule formation. Rule formation is a two step process: compilation and strengthening. In compilation step, specific knowledge related to the rules is embedded (proceduralization) and the rules which are consistently applied together are combined (composition). The strengthening step is there for increasing the strength of the rule –hence the name- and automating it. These two steps are the core of part-task practice which will be discussed below.

After discussing the constituent skills in a complex learning task, Van Merriënboer and colleagues (2002) introduce the four components of their blueprint for complex learning environments. These four components are:

1. Learning Tasks: concrete, authentic, whole-task experiences that are provided to learners in order to promote schema construction for non-recurrent aspects and, to a certain degree, rule automation by compilation for recurrent aspects. These tasks are practiced in a real or simulated task environment and should make the learners use the skills instead of study information about the skills
2. Supportive Information: information that is supportive to the learning and performance of non-recurrent aspects of learning tasks. It is the necessary information for the successful practice of non-recurrent skills. It provides the bridge between learners' prior knowledge and the learning tasks.
3. Just-in-Time (JIT) Information: information that is prerequisite to the learning and performance of recurrent aspects of learning tasks.

Specific JIT information is related to a recurrent skill, and therefore, it is provided only for the first learning tasks that involve this skill and it is quickly faded.

4. Part-Task Practice: practice items that are provided to learners in order to promote rule automation for selected recurrent aspects of the whole complex skill. Learning tasks provide practice for both non-recurrent and recurrent aspects of complex learning. However, in cases where a high level of automation on a particular recurrent aspect is required it may be necessary to include part-task practices in the instruction, because it fosters compilation and especially strengthening of rules.

The major aspects of the model can be reviewed by starting with its four components: learning tasks, supportive information, just-in-time information and part-task practice. All these components are interwoven to provide a facilitative complex learning experience by providing all the necessary information and practice for successful performance of the final task. The importance of the 4C/ID model for the current study lies in the guidance it provides. In the present study, the sequencing of learning activities is based on the recommendations related to tasks and task classes. The type of information to be presented and the way of presenting the information is based on the distinctions between supportive and JIT information. For recurrent aspects of the skills, information is presented just-in-time and is quickly withdrawn. For non-recurrent aspects, supportive information is presented before the tasks. Finally, for skills that may require automatization – e.g., usage of mnemonic techniques- part-task practice is utilized.

To summarize, the presented three instructional design models, Gagné's Conditions of Learning, Merrill's 5-Star Instruction and Merriënboer et al.'s 4C/ID were used in a combined fashion to build the instructional program in the current study.

1.5. *Instructional Software Design*

Software design is the second part of online training design –it is the “online” part. It goes hand in hand with instructional design to create valuable training material. It provides the link between the instructor/instructional design

and the learner. It is the “application” of the instruction. Software design, like instructional design, actually covers analysis, design, and evaluation. Most of work involved in these steps need to be performed simultaneously with instructional design. In the present study, analysis of the environment was actually the analysis of the available computer technology in the campus, as the limits of these computers would limit the technology used in developing the software. Designing and developing instructional materials involved consideration for the related parts of the software design.

For online instruction, practice materials needs to be effectively applicable through available technology and in the online instruction environment. If the instruction is intended to be individualized, the related software attributes should be planned ahead. These and similar points may seem too abstract and vague at this point, but a brief discussion of relevant technologies and their application for instruction will illuminate the important points. After this introduction, three models for online instruction by Wiley (2000), Armani et al. (2004), and Govindasamy (2002) are presented to clarify the integration of instruction and software.

Currently, one of the popular concepts related to e-learning is Learning Objects (LO's). There are different definitions of LO. According to Sosteric and Hessemeier (2002) “A learning object is a digital file (image, movie, etc.,) intended to be used for pedagogical purposes, which includes, either internally or via association, suggestions on the appropriate context within which to utilize the object” (p. 4). Singh (2002) provides the definition of IEEE-LTSC (Institute of Electrical and Electronics Engineers - Learning Technology Standards Committee): “A learning object is any entity, digital or non-digital, which can be used, re-used or referenced during technology supported learning” (pp. 4-5).

Sharable Content Object (SCO) is the name used instead of LO in Shareable Content Object Reference Model (SCORM) Second Edition specification. A SCO is defined as “a collection of one or more Assets that represent a single launchable learning resource that utilizes the SCORM RTE to communicate with an LMS” where “assets are an electronic representation of media, such as text, images, sound, assessment objects or any other piece of data that can be rendered by a Web client and presented to a learner. More than one asset can be collected together to

build other assets” (SCORM Content Aggregation Model Version 1.3.1, p. 13). The definition seems complex but in simple terms, what it says is that a SCO is a digital file or a collection/combination of several digital files which can be used alone to provide specific information/instruction. In the current study, as briefly explained later, the learning content was designed so that, each learning activity consisted of one or more digital files and they communicated with the developed software through a simplified set of communication methods. Therefore, although not fully SCORM compliant and not exactly objects in the exact sense, the training material of the current study was implemented as simple learning objects. SCORM RTE is the Run Time Environment for SCORM which is, in simple terms, a technical specification for defining the connection between SCO’s and the LMS. Detailed information about the RTE will not be provided in this paper, but some necessary parts will be briefly reviewed in later sections. In current study, there was a simple RTE which provided basic functions for communication with the learning objects, i.e., learning activities. For more details see Dodds (2004a and 2004b).

The definition of SCO includes the abbreviation “LMS” (short for “Learning Management System”). In simple terms, LMS is the part of the software that manages the content (presentation, sequencing, etc.) and the users (registration, performance tracking, etc.). Actually, much discussion about software design relates to this part of the software. In a sense, LMS is the “instructor” and “administrator” of the course. The design of the LMS mainly depends on the instructional design. If the instructional design uses a predetermined sequence, certain types of practices and evaluation methods, then LMS should implement it exactly as it is planned. On the other hand, if the instruction aims individualization, then LMS should be able to use relevant information (e.g., information provided through meta-data, user’s scores) and dynamically determine the content to be presented, the order of presentation, the level of feedback, density of practices, etc. Hence, LMS provides the actual implementation of instructional design through its use of information about the learning materials and the learners. However, developing new LMS software for each instructional program would be a major hindrance in the development phase for online instructional designers. With the advent in software technology and development of related standards, this

problem has been partially overcome by the availability of many general purpose LMS software. These LMS software are capable of accommodating varying instructional content and different instructional designs. This capability is provided by the adherence of these systems to standards and specifications such as SCORM. Some examples of such LMS software are commercial solutions like WebCT (<http://www.webct.com>), Black Board (<http://www.blackboard.com>), or open source solutions like White Board (<http://whiteboard.sourceforge.net/>) and Moodle (<http://moodle.org/>). A lot of open source alternatives can be found at <http://www.opensourcecms.com/>; also Depow (2003) reviews three open source learning and content management systems: Bazaar, Moodle, and Plone.

LO's or SCO's, LMS and RTE have the following relationship: The LO's or SCO's provide the ingredients of the instruction, namely the objects which are selected, sequenced and presented by the LMS. The methods and other details of the relationship between the LMS and SCO's are determined by the RTE. These components and their interrelationships are discussed in more detail in later sections. In the following sections, models for online instruction are reviewed.

1.5.1. Learning Objects Design and Sequencing

Learning Objects Design and Sequencing (LODAS) is a model developed by Wiley (2000). As the name implies, it is based on LO's and the aim of Wiley's study was "to develop an instructional design theory that (1) provides explicit support for scope and sequence decisions about learning objects, (2) provides a taxonomy of learning object types, and (3) provides design guidance for each type of object" (p. 11). In accordance with these goals, Wiley presents a methodological approach which involves a taxonomy of LO types, provides guidelines for designing each type of LO's, and includes suggestions and guides for determining the scope of and sequencing LO's. After reviewing several instructional design methods, Wiley incorporates some components from these methods to build the instructional basis of his study and comes up with six steps (groups of methods) for building online instruction: (1) preliminary activities, (2) analyzing and synthesizing content, (3) designing practice and information presentation, (4) selecting/designing learning objects, (5) designing learning object sequencing, and (6) looping back for quality.

Preliminary activities involve making sure that LODAS is appropriate for the case at hand. As LODAS' main instructional methods are based on Van Merriënboer et al.'s 4C/ID model (2002), it is best suited for complex cognitive skills. Analyzing and synthesizing content mainly involves analyzing the content and restructuring it in a way that is more appropriate for instructional design

Next the way of information presentation and practice is designed. This step mainly rests on 4C/ID model in classifying the skills and work activities (recurrent – non-recurrent). After this classification, the relevant knowledge (supportive or JIT) and practice types (whole-task or part-task) are determined and the decision for the necessary types of information and practice for all the skills and work activities is made.

Fourth step makes the transition from raw instructional design to actual online instruction structure. At this step, each individual learning object is designed or selected from the currently available sources. At the fifth step, the order of usage of these objects is determined. At these stage, the work activities and skills determined at the second step (analyze and synthesize content) are used for sequencing purposes. Finally, Wiley (2000) proposes a loop back for quality improvement. Although many models implicitly involve this step, Wiley explicitly suggests application of an evaluation and improvement cycle to achieve higher quality instruction.

1.5.2. Integrating Instructional Design and Hypermedia Design

Armani et al. (2004) point out the lack of a shared model for hypermedia design and instructional design and propose a model for integrating these two aspects. Since they are interested in the integration, these authors do not delve deeply into instructional design area or hypermedia design area. Instead, they provide global points of contact between the two and build a generic integrated framework with three levels. These three levels are educational context, requirements, and design.

The educational context level contains elements of analysis phase of conventional instructional design and categorizes them into learners or instructors analysis. The requirements level also contains two groups of requirements: learning requirements and hypermedia requirements. The information collected in

the educational context level provides the input for both learning and hypermedia requirements. The requirements should be transformed into characteristics of the instruction for the best results. The learning requirements can be grouped into four design dimensions: use of time (i.e., if the learning activity is held in synchronous or asynchronous mode, if it has a predefined start date and end date, etc.), use of space (i.e., if the learning activity contains face-to-face sessions and/or distance activities, etc.), grouping (i.e., if the learners work individually, in pairs; in groups or as a whole class), and guidance (i.e., what kind of frontal teaching, scaffolding and feedback is provided to the learners).

In terms of the use of time, the training program developed for the current study is an asynchronous one. It does not involve face-to-face sessions and requires the learners to work individually. The decisions about kind of frontal teaching, scaffolding and feedback in the current training program (i.e., when and how to present and withdraw information) are made based on the principles provided by Van Merriënboer et al. (2002). Mainly, supportive knowledge for each part of the training was presented before related practices and then it was withdrawn.

Hypermedia requirements are organized among other six dimensions: content (the set of ideas and messages that the site communicates to its users), structure of content (the organization of the content), access paths (the navigational paths available to the user in order to start navigation and to locate and reach the content needed for accomplishing his or her goal within an educational activity), navigation (suggesting connections between different information pieces allowing the user to navigate from one piece of content to another), presentation (providing guidelines and visual communication strategies for presenting content, navigational capabilities and operations to the user), and user operation (properties of those operations those are visible to users to complete some tasks) (Armani et al., 2004).

The content of the training program for the current study is determined based on general suggestions about the needs of students (e.g., Casey, 1991; Feldman, 2003; Frank, 2003; Neath, 1998; Waldman, 1972; Zimmerman, Bonner, and Kovach, 1996). Structure of content is guided by the principles set forth by Merrill (2000) and Van Merriënboer et al. (2002). User operation requirements –i.e. what

the users will be able to do in the site- is determined based on the requirements related to structure, navigation, and presentation and the needs for interaction and application.

Finally, the design level contains learning activity design and hypermedia application design. The learning requirements are implemented through learning activity design while hypermedia application design builds on hypermedia requirements determined at the previous level. As stated earlier, this framework is very broad and aims to provide a general guidance for integration of the software design and instructional design parts.

1.5.3. Successful Implementation of e-Learning: Pedagogical Considerations

The last topic to be reviewed in this section aims to connect pedagogical considerations with software considerations (Govindasamy, 2002). Govindasamy emphasizes the idea that pedagogical principles build the basis for success of any kind of training because “pedagogical principles are theories that govern the good practice of teaching” (p. 289). Many LMS software are criticized because they do not give enough emphasis to pedagogical structure, and it is suggested that inclusion of features in an LMS should depend on pedagogical principles. Govindasamy proposes a 9-step instructional design model, which might be considered a well-structured reorganization of several other models reviewed earlier, for the development of e-learning material, which seems very relevant for the current study.

The model mainly defines the steps in which the online instruction will be produced. The model begins with the analysis phase, in which both learner and task analyses are carried out. The second phase, design phase, includes the definition of instructional objectives and selection of instructional strategies. In the third phase, the first production phase, first draft of the instructional material is prepared. In the fourth phase, formative evaluation phase, the material is reviewed by a content expert, and then it is tested through one-to-one trials and a small group trial. In the last phase, the second production phase, the first version of the e-learning module, i.e. the material that will be used in the application and that will form the basis for future improvements, is produced. The model is presented below.

Table 1.1: Instructional development methodology for development and evaluation of e-learning content

Step	Aim	Product
Analysis Phase		
Learner Analysis	Identify characteristics of learners	Learner profile
Task Analysis	Determine level of detail and depth of content	Task-sheet and information flowchart
Design Phase		
Defining Instructional Objectives	Write instructional objectives according to Mager's format	Instructional objectives
Selecting Instructional Strategies	Select instructional activities and media elements	Plan on how to achieve instructional objectives
Production Phase (I)		
Preparation of First Draft Material	Produce draft material	Draft instructional material
Formative Evaluation Phase		
Review by Content Expert	Gather information about weaknesses and revise draft material	Revised instructional materials
One-to-one Trial	Gather information about the weaknesses of the material	List of amendments required to improve the material
Small Group Trial	Gather info(continued) it the weaknesses of the material	List of amendments required to improve the material
Production Phase (II)		
Production of the First Version of the e-Learning Module	Produce the instructional material	First version of the e-learning module

Source: Govindasamy, T. (2002). Successful Implementation of e-Learning: Pedagogical Considerations. *Internet and Higher Education*, 4, 290-291

The Mager's format (Driscoll, 2002) of instructional objectives referred in Govindasamy's (2002) methodology is a format for writing instructional

objectives. It consists of four important components called ABCD, where A is for audience, B is for behavior, C is for conditions, and D is for degree (Heinich, Molenda, Russell, and Smaldino, 2001). Together, the ABCD answers the questions, whose capability will change, what the learners will be able to do after completing the training, under which conditions will the performance will be observed, and what standard or criterion will be used to evaluate the performance.

Although Govindasamy's (2002) model seems to be linear, Govindasamy notes that it does not proceed linearly from beginning to end. There will be back-and-forth moves between steps during development. Govindasamy also supports evaluation-revision cycle, so both during the development process and even after production, the work on improving the instruction continues.

1.6. Factors Affecting the Success of Online Instruction

Current study's main aim was to investigate the effect of individual differences of the learners on the outcomes of online instruction on how to be an effective learner. The outcomes that are examined are the successful demonstration of knowledge and skill gains in the training context, the practice-level undertaken by the learners, and completion rate of the program. Detailed information on these outcome variables (i.e., dependent variables) are presented in the methods section. In the following sections, the individual difference factors that are expected to affect the success of online instruction are discussed.

1.6.1. Individual Difference Variables Critical in Instructional Context

Brown (2001) suggests that CAI has the benefit of individualization of the training. Along with this individualization and reduction in the interaction with the actual instructor comes a shift of responsibility from the instructor to the learner. Therefore, certain characteristics of the individual learner become one of the main determinants of the course and the results of the training. Brown (2001) states that goal orientation, learner choices, and self efficacy are three important characteristics affecting the performance of the learner in a CAI.

The first factor, goal orientation, is defined as the broad goals held by an individual as he or she faces a learning task (Fisher & Ford, 1998). According to Elliot and Dweck (1988), there are two broad categories of goals pursued by

individuals in achievement situations: performance goals and learning (mastery) goals. In performance goals, individuals try to maintain positive judgments and to avoid negative judgments of their ability by seeking to prove or validate it (Dweck 1988; Bell & Kozlowski, 2002). In learning goals, individuals seek to improve their abilities or master new tasks and thus increase their competence (Dweck 1988; Fisher & Ford, 1998; Bell & Kozlowski, 2002). Dweck (1986) calls motivational patterns “that promote the establishment, maintenance, and attainment of personally challenging and personally valued achievement goals” (p. 6) as adaptive motivational patterns, whereas she calls motivational patterns that “are associated with a failure to establish reasonable, valued goals, to maintain effective striving toward those goals, or, ultimately, to attain valued goals that are potentially within one's reach” (p. 6) as maladaptive patterns. She states that children with maladaptive patterns are hampered in acquisition and display of cognitive skills in presence of obstacles. Maladaptive patterns are related to a greater tendency to withdraw from tasks (especially in the face of failure), less interest in difficult tasks, and seeking less challenging tasks on which success is likely (Bell & Kozlowski, 2002). On the other hand, children with adaptive patterns are not held back, and their performance is improved even when faced with obstacles. Adaptive response patterns are associated with persistence in the face of failure, the use of more complex learning strategies, and the pursuit of difficult and challenging tasks (Bell & Kozlowski, 2002). Highly mastery-oriented persons also tend to respond to task challenges with increased effort and feedback seeking (Davis, Carson, Ammeter, & Treadway, 2005). As a result, adoption of learning goals encourages children to explore and pursue tasks that promote intellectual growth, thus the focus is on mastery and growth. On the contrary, with performance goals, the entire task choice and pursuit process is built around children's concerns about their ability. As a result, performance-oriented individuals can try to avoid and withdraw from challenge, while learning/mastery-oriented individuals tend to seek challenge (Dweck 1986).

Elliott and Dweck (1988) examined the relationship between goal types and the level of perceived ability. The authors hypothesized and showed that when performance goals were highlighted and the individuals believed their skills to be high, they responded in a mastery-oriented manner in the face of obstacles.

However, they, like performance-oriented individuals, who believed their skills were low, did not take the opportunity to improve their skills when the task involved potential public mistakes. Additionally, Elliott and Dweck (1988) showed that regardless of the perceived level of skill, if mastery was the goal, individuals sought to increase their skills (i.e., they chose challenging tasks) and did not forfeit the opportunities for growth even if they involved potential public errors. Moreover, mastery goal orientation has been shown to create better results in terms of declarative knowledge (Hertenstein, 2004). Similarly, Ford, Smith, Weissbein, Gully and Salas (1998) found that mastery orientation was significantly related to metacognitive activity, which, in turn, was related to knowledge acquisition. According to Dupeyrat and Mariné (2004), mastery orientation also has a positive relation with deep-processing strategies which may increase learning. Cobb (2003) also found that mastery orientation led to higher academic success in an online setting. Therefore, it seems reasonable to expect that individuals with mastery goal orientation are more likely to undertake more practices and benefit more from online instruction.

In accordance with prior findings, Brown's study (2001) started with the expectation that learners with high mastery-orientation would see practices as a learning opportunity and thus complete more of the available practices, while learners with high performance orientation were expected to focus more on their performance than learning. However, the results showed that the relation between goal orientation and practice levels may not be this simple. The indication was that individuals with low performance goal orientation and low self-efficacy undertook more practices than highly performance oriented individuals. Brown suggested that there might be an interaction between goal orientation and self efficacy in determining the practice level.

The second individual difference factor in Brown's study (2001), learning self-efficacy, is "a belief concerning one's ability to perform behaviors yielding an expected outcome that is desirable" (Allen, 1997, p. 316). Allen also proposes that self-efficacy is a specific form of confidence regarding certain behaviors. Self-efficacy influences both whether a person will attempt a behavior and the quality of performance once attempted. High efficacy leads to persistence in the face of obstacles and frustrations. Low efficacy will lower effort increasing the probability

of failure. Persistence leading to success will increase self-efficacy while failure will decrease it (Allen, 1997).

Schunk and Zimmerman (1997) also support Allen's (1997) statements: "self-efficacy beliefs (personal variable) influence achievement behaviors (choice of tasks, effort, persistence) in that efficacious students are more likely to chose to engage in tasks, expend effort, and persist to overcome obstacles and succeed" (p. 196). Similarly, Bouffard-Bouchard (1990) showed that students with high self-efficacy worked more practice problems than students with low self-efficacy. Schunk and Zimmerman (1997) also suggest that successes related to a specific outcome raise self-efficacy regarding that specific outcome while failures decrease it. As mentioned earlier, Zimmerman et al. (1996) also propose that training in skills related to learning can increase learning self-efficacy of students.

In addition to goal-orientation and self-efficacy, there can be other individual differenced factors affecting performance in CAI programs. It is reasonable to expect more stable personality characteristics of individuals to interact with the training to influence the outcome of the training. Trait theories of personality aim to identify these more salient basic dimensions of personality (Pervin, 1993). These theories assume that people possess broad predispositions to respond in particular ways. These predispositions are called traits. One of the most influential trait theories was that of Eysenck's based on the traits *Introversion-Extroversion*, *Neuroticism*, and *Psychotism* (Pervin, 1993). And a more recent and influential one is the so called Big Five trait theory of personality (Goldberg, 1990).

The main five factors that are proposed to underlie personality have traditionally been called (I) Surgency (or Extraversion), (II) Agreeableness, (III) Conscientiousness (or Dependability), (IV) Emotional Stability (vs. Neuroticism), and (V) Culture (or Intellect, or Openness) (Goldberg, 1990). The names extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience are the most widely used ones. Pervin (1993) provides brief explanations for each trait taken from Costa and McCrae (1992). According to these definitions, neuroticism is an indication of adjustment vs. emotional instability. Extraversion assesses quantity and intensity of interpersonal interaction, activity level, and need for stimulation. Openness involves proactive seeking and appreciation of experience and exploration of novelties.

Agreeableness indicates one's position on a continuum ranging from compassion to antagonism in interpersonal relationships. Finally, conscientiousness assesses the individual's degree of organization, persistence and motivation in goal directed behavior. Pervin (1993) and Furnham (1997) provide basic characteristics for each trait; for the purposes of current study, only the characteristics related to conscientiousness is reviewed here, because it is expected to affect the success of online instruction more than other characteristics.

Individuals high on conscientiousness are –as the trait name suggests– conscientious and well organized, has high standards, strive to achieve goals, and are hard-working. On the other hand, individuals low on this trait are easygoing, disorganized, and sometimes careless, negligent, lazy, and quitting; they prefer not to make plans. Zhang (2003) showed that conscientiousness significantly contributed to deep, “which involves a real understanding of what is learned” (p. 3); and achieving, “which involves maximizing one's grades” (p. 3) approaches to learning. It has been also shown that students high on conscientiousness were more willing to spend time on information seeking and go through trouble obtaining information (Heinström, 2000). Heinström also claimed that conscientiousness is the most important characteristic related to academic success. This trait was expected to be critical for online instruction because it was related to willingness to spend time and exert effort for learning (Heinström, 2000), and because online instruction requires a high degree of self discipline and organization. In the light of the past studies showing that individuals with higher levels of self direction do better in online instruction (e.g., Harbeck, 2001) it was reasonable to expect that conscientiousness would affect the outcomes of the online instruction. More specifically, conscientiousness level was expected to determine the undertaken practice level.

1.7. Combining the Instructional Models and the Individual Difference Factors

The present study included development of an online training program for enriching the learning skills of college students. The aim of the study was to measure the effects of several parameters which were brought into the program by

the learners (individual differences) and varied between randomly-assigned groups to see their effects on the success of the program.

To achieve its aims, the study followed a structured model in its application. The model proposed by Govindasamy (2002) was used as a guide in the development of the training program. Govindasamy's model is the global blueprint for the training program. The development of the training program is based on recommendations by earlier studies and other authors noted elsewhere, and these recommendations took the place of the needs assessment for the decision on the content to be delivered through the program. Afterwards, the instructional objectives for this content were set, using the Mager's format (Driscoll, 2002). Then Van Merriënboer et al.'s (2002) 4C/ID model was used to select instructional activities and media elements. Then a formative evaluation was carried out –as a pilot run- following Govindasamy's recommendations, information about this pilot study is provided later in the method chapter. Finally, necessary additions and improvements were integrated into the material and the development was completed. During the development, Merrill's (2000) principles were applied either indirectly (e.g., 4C/ID already implements all principles to some degree) or directly (e.g., suggestions for integration was employed through providing recommendations for applying newly acquired knowledge and skills to daily life).

1.8. Outcome Variables

Alliger, Tannenbaum, Bennet, Traver, and Shotland's (1997) augmented version of Kirkpatrick's taxonomy provides a sound framework for the evaluation of the online instruction developed in the current study. More specifically, augmented taxonomy of training evaluation criteria underlie, the two outcome variables of the current study (i.e., immediate post-training knowledge and skill demonstration).

The augmented taxonomy contains criteria at four levels: Reactions, Learning, Transfer, and Results. The reactions criterion is divided into two sub-criteria: utility reactions and affective reactions. Utility reactions measures the degree to which the learner believes the newly gained knowledge and skill will be beneficial in the daily life application. Affective reactions measure the degree of the liking or positive feelings related to training.

Alliger et al. (1997) divide learning criteria into three categories. Immediate post-training knowledge is concerned with trainees showing how much they now about the topic. The second category, knowledge retention, is primarily same as immediate post-training knowledge, the only difference being the time of measurement –i.e. retention is examined at some later time. The last category is behavior/skill demonstration and measures the proficiency in the training environment. Transfer relates to the application of newly acquired skills on the job. Finally, results relate to the effect of training to the organization (e.g. change in productivity or profits).

From this taxonomy, the *immediate post-training knowledge and behavior/skill demonstration* were used as measures in the current study.

In addition to these criteria, Considering Zimmerman et al.'s (1996) and Schunk and Zimmerman's (1997) statements that training in related skills and success can increase self-efficacy, learning self-efficacy was also used as an outcome variable as well as an independent variable. The self-efficacy level of the learner would have effects on some of the outcome variables. It was also expected that completing the training program would affect the self-efficacy level of the learner.

Practice level and completion rate were the last two outcome variables, chosen in line with Brown's (2001) suggestions. Practice level is mainly determined by the number of practice trials undertaken compared to available number of practices. Brown states that the amount of practice undertaken by the learner varies among individuals, if they are allowed to choose that amount. Therefore, it is necessary to measure the level of practice undertaken by each individual.

1.9. Hypotheses

Developed online training program will have positive outcomes in terms of selected criteria from Alliger et al. (1997).

Hypothesis 1a: Students who attend the online training program will demonstrate acquisition of the knowledge in immediate measurements.

Hypothesis 1b: Students who attend the online training program will demonstrate increase in their skills in the training context.

Previous research has shown that mastery goal orientation leads to pursuit of difficult and challenging tasks (Bell & Kozlowski, 2002). Dweck (1986) showed that mastery oriented individuals tend to seek challenge. Similarly, highly mastery-oriented individuals have been found to exert more effort when faced with task challenges (Davis, Carson, Ammeter, & Treadway, 2005). In the light of these studies, the following hypothesis is proposed:

Hypothesis 2: Mastery goal orientation level of the students will predict the practice level undertaken.

Mastery goal orientation has been shown to create better results in terms of declarative knowledge (Hertenstein, 2004). Similarly, Ford, Smith, Weissbein, Gully and Salas (1998) found that mastery orientation was significantly related to knowledge acquisition. It has been also stated that through deep processing strategies, mastery goal orientation may increase learning (Dupeyrat and Mariné, 2004). Combining these findings, mastery goal orientation level of the students is expected to have positive relationships with the training outcomes. Hence, following hypothesis is put forth:

Hypothesis 3a: Students with higher mastery goal orientation will demonstrate a higher success in acquisition of knowledge in immediate measurements.

Hypothesis 3b: Students with higher mastery goal orientation will demonstrate higher increase in their skills in the training context.

Allen (1997) and Schunk and Zimmerman (1997) claim that self-efficacy beliefs affect achievement behaviors, including choice of task, effort and persistence, and thus determine the choice to engage in tasks and expend effort. Similarly, Bouffard-Bouchard (1990) showed that students with high self-efficacy worked more practice problems than students with low self-efficacy. Accordingly, the following hypothesis is constructed:

Hypothesis 4: Learning self-efficacy level of the students will predict the practice level undertaken.

It has been shown that students high on conscientiousness were more willing to spend time on information seeking and go through trouble obtaining information (Heinström, 2000; Zhang, 2003). Therefore, it is hypothesized that

conscientiousness level of the students will affect the involvement of students in the program. Specifically,

Hypothesis 5a: Conscientiousness level of the students will predict level of practice

Hypothesis 5b: Conscientiousness level of the students will predict completion rate.

According to Allen (1997), persistence leading to success will increase self-efficacy while failure will decrease it. Schunk and Zimmerman (1997) suggest that successes related to a specific outcome raise self-efficacy regarding that specific outcome. Additionally, Zimmerman et al. (1996) propose that training in skills related to learning can increase learning self-efficacy of students. Therefore, the following hypothesis is built:

Hypothesis 6: Completing the training program will increase the learning self-efficacy level of the students.

CHAPTER 2

METHOD

2.1. Overview

This study investigated effects of several individual difference factors (i.e. goal orientation, conscientiousness, learning self-efficacy, and practice levels) on the success of online instruction. To investigate these effects, an internet based instruction program aiming to improve academic success level was developed and applied. To reduce the possibility of having technical problems in the online instructional program and to test the individual difference factor measures, two pilot studies were carried out. The first pilot (Pilot I) was for the individual difference factor scales and the second one (Pilot II) for the online instruction. Following the pilot studies, some improvements and changes were made in the program and then the real application began. In this chapter, information regarding the sample, measures, and procedure are provided. Detailed information about the instructional program is provided later in the training program section.

2.2. Sample

In this section, the characteristics of the samples for the two pilot studies and the main study are presented. However, before presenting those characteristics, the reasons for the selection of a college sample is explained.

There are five reasons for using a college sample in the current study. First of all, with the great number of students registered at Middle East Technical University (METU) [according to the official website (<http://www.metu.edu.tr/about/misguide.php>) more than twenty thousand students have registered in 2003-2004 academic year] there is a large population to pick the sample from.

Second, the students are usually computer literate. High availability of computers in the campus, existence of an introductory must course on basic computer usage, the necessity of computer usage for many course activities – e.g.,

preparing reports, conducting research, etc. - together increase the students' skill level in computer usage more than enough for a "considerately designed" online instruction program. Here, "considerately designed" means an instructional program which is easy to use for users who can open, save and close files; surf the Internet; conduct basic search over Internet, and follow clearly written guidelines to install plug-ins for their browsers (e.g., flash player, shockwave player).

Third, as mentioned above, there are many computer laboratories in the campus (fourteen run by the Computer Center of the university, containing more than 300 PC's, and many other labs serving the students of specific departments; some dormitories also have their own laboratories), all of which make the access to online material easier for students.

Fourth, and most importantly, since the main responsibility of the students and the most prevalent activity in the lives of students is learning, they are expected to be more inclined to take part in a learning improvement program. Finally, although current study had no such intention; it is possible to continue to monitor the effectiveness of the instruction and follow up the results in the long term by using the students' academic records until they graduate. It is also possible to provide further instruction programs (e.g., for remedy or maintenance) to students and evaluate the effects of such follow-up interventions in the long term.

At this point, it may be necessary to note that studies conducted with college students are usually criticized as not reflecting the real world conditions and thus are accepted as laboratory studies. The college setting reduces their validity for the actual environment (e.g., the industrial setting or the office space). However, current study aimed to improve the learning skills of students and thus it is not out of context. The "job" of student is to learn. Therefore, the study was carried out in the real application context and as such should be considered a field study, with considerable generalizability.

In Pilot I, individual difference factor scales were administered to two classes of students during 2005 summer school. A total of 94 students took part in this pilot study, (28 from SOC-434 class and 66 from PSY-150 class). In Pilot II the training program (i.e., learn to learn program, explained later), was administered to 43 students taking industrial psychology (PSY-335) course.

Finally, the main study began with 593 participants. Detailed distribution of these participants is presented in

Table 2.1.

Table 2.1: Status of Participants of Main Study

Status	Number
Current METU Students	568
Undergraduate	404
Masters' Degree	79
Ph.D. Degree	57
Two-Year-Degree	28
Academic/Administrative Personnel	12
METU Graduates	6
Outside METU	7

Six of the students and one personnel were from Northern Cyprus Campus of METU. The departmental distributions of students and the students' years in the program can be seen on **Appendix A** and **Appendix B** respectively.

2.3. Measures

The measures used in this study can be divided into two groups. First group of measures consisted of the three individual difference scales – i.e. goal orientation scale, learning self-efficacy scale, and the big five inventory-, while second group contained tests measuring the effects of the training program, i.e. knowledge and skill tests.

2.3.1. Learning Self-Efficacy Scale

The learning self-efficacy scale was developed by the researcher himself based on the guidelines presented by Bandura (1997). The scale contained a total of 15 items tapping into the perceptions of self-efficacy regarding self-directed learning, computer and internet based learning, general learning, and learning to improve mental skills. Respondents were asked to indicate the extent to which they

felt confident that they could learn new material (e.g., “I can learn the techniques taught in an instructional program for improving mental skills”). During the pilot study for the measures, the participants responded based on a 100-point scale, ranging from totally disagree (0) to totally agree (100). However, after the pilot study, for the main application, the scale was converted into a 5-point Likert type scale ranging from totally disagree (1) to totally agree (5). The measure as it was used in the pilot study can be found in **Appendix C**, while **Appendix D** contains the measure as it was used in the main study. The cronbach’s alpha value during pilot II (application of training), in which the measure was used with a five point likert type scale, was .891.

2.3.2. *Goal Orientation Scale*

The goal orientation scale contained 18 questions. Sixteen of these questions were translated from the original scale by Button, Mathieu, and Zajac (1996) (e.g., “The things I enjoy the most are the things I do the best”). Remaining two items were added by the researcher (e.g., “When deciding on an elective course to take, I prefer classes in which I can learn new things.”). Initially, the scale was intended to measure only performance goal orientation (PGO). Henceforth, during the pilot study for the measures, only the 8 items measuring PGO were used and the participants responded using a 7 point likert scale, ranging from totally disagree (1) to totally agree (7). The items were ordered same as the original source.

However, during the main application, to have a complete measure of goal orientation, the complete 18-item scale was used and the scale was converted to a 5-point Likert type ranging from totally disagree (1) to totally agree (5). The items were ordered completely randomly. The measure as it was used in the pilot study can be found in **Appendix E**, while **Appendix F** contains the measure as it was used in the main study. The cronbach’s alpha value in Pilot II (application of training), was .73.

2.3.3. *The Big Five Inventory*

The Big Five Inventory by Benet-Martinez and John (1998), translated by Sümer, Lajunen, and Özkan (in press), was used to measure the Big Five Personality Traits of the participants. The measure contained a total of 44 items

(e.g., “I see myself as someone who ...”, “is talkative”, “does a thorough job” rated on a 5-point Likert type scale (1 = Totally Disagree; 5 = Totally Agree). The pilot study revealed that one item –“reserved” - “ketum/vakur”- was problematic; two words used to explain the trait were confusing for the participants, so one of the words (i.e. vakur) was removed to avoid confusion during main study. The measure as it was used in the pilot study can be found in **Appendix G**, while **Appendix H** contains the measure as it was used in the real application. The cronbach’s alpha value obtained at Pilot II (application of training), was .71.

2.3.4. Measures for Training Results

Tests assessing the effectiveness of the training were also used as measures. These tests were used to determine the effects of the training on the outcome variables behavior/skill demonstration and immediate post-training knowledge. For this purpose, each module (i.e., part of the training program) contained tests measuring its effects. Each of these tests were applied before the onset of the training (pre-test) and end of the training (post-test).

2.3.4.1. Measures for Effective Time Management Module

Two tests were used as measures in effective time management module. First test consisted of 13 items, 10 true-false (e.g., “Time loss can be compensated.”) and 3 multiple-choice questions (e.g., “Which of the below are definitely necessary for effective time management”) assessing the knowledge of the participant on the time management topic. Second test contained nine items for measuring participant’s attitude towards time management and actual time usage (e.g., “I often have trouble with meeting deadlines for home-works, reports, and projects”). These 9 questions were answered using a 5 point Likert scale (1 = Totally Disagree; 5 = Totally Agree). These two tests were used to measure different aspects of the situation of the student in time management, and they were applied both in pre- and post-test. The first and second tests can be found in **Appendix I** and **Appendix J** respectively.

Measures for Fast and Effective Reading Module

For the fast reading part, a reading speed test was used to assess the reading speed of the participant. The test was applied by providing the participant with a

text to read and then measuring the time it took to finish reading that text. Then, the number of words in the text was divided to that time and the reading speed in words per minute (wpm) was calculated by the software.

For the effective reading part, reading comprehension tests were used. The participants were given a pre-selected text and after reading the text, they were required to answer ten questions regarding that text. A sample text with the questions can be found in **Appendix K**. The texts were selected by two student assistants helping the researcher and then written permission was requested from the publishers to use the texts in the study. The criteria and method for selection of the tests are explained in detail later in the training program section.

Questions for the texts were developed by the researcher and the two student assistants helping the researcher. After producing ten to fifteen questions for each text, most appropriate ten were chosen to be used. The guidelines for developing questions were simple. First, they had to conform to a technical requirement so that they could be rated by the computer without requiring human interruption. For this reason, the questions had to be in one of the following forms:

- True-false
- Multiple-choice with one or more correct answers to choose from several alternatives
- Open ended with one word or a short phrase as answer
- Matching

To avoid potential problems, open ended questions usually had an answer, which could not be stated in a different way. Also potential different spellings of the answer were also considered correct; this especially required checking for any combination of Turkish characters with their non Turkish counterparts. For example, if the answer was 'derin ekoloji', then, 'DERİN EKOLOJİ', 'derin ekoloji', and 'DERIN EKOLOJI' were also considered correct.

Second, it was required that the questions would be formulated from as many different sections of the text as possible to measure a general understanding of the whole text. Finally, it was aimed to provide questions which measure comprehension as well as direct retention of information presented in the text. A sample text with the questions can be found in **Appendix K**.

2.3.4.2. Measures for Active Use of Memory Module

Active use of memory module contained various tests to measure different kinds of memory usage. The skills for free recall (i.e., recalling any item presented in a set in no particular order), ordered recall (i.e., recalling items presented in a set in the given order), paired recall (i.e., recalling an item from a previously seen pair, given the other item in the pair is presented), and number recall (i.e., recalling a number with several digits) were measured with the tests. All the tests provided the material to be recalled and then presented the participant with an appropriate way to show what s/he could recall. Tests were applied at the beginning and at the end of the module. There were also tests measuring the use of different memory skills (e.g., paired recall, number recall) between the training sections, after the techniques and practices. Examples of free recall, ordered recall, paired recall, and number recall tests can be found in **Appendices L through O**.

2.4. *Training Program*

2.4.1. *Development of the Training Program*

Three major topics were selected to be covered in the training program: Effective Time Management, Fast and Effective Reading, and Active Use of Memory. Each topic was developed as a separate module. After determining the major topics to be covered in the training program, a comprehensive literature review was carried out for each area. List of the resources examined for each area can be found in **Appendix P**.

2.4.1.1. Effective Time Management

Effective Time Management was the first module. The researcher's involvement with self development and past experience in the area helped in structuring the Effective Time Management Module as well as the Fast and Effective Reading Module. The information collected from various resources was brought together and structured using mind mapping technique (Wikipedia Mind Map Page, 2006). Basically, a mind map consists of branches connecting nodes and sub-nodes to a single major topic. Each node holds a key word or key phrase

related to its upper node and finally to the central topic. An example mind map can be seen in **Appendix Q**.

A large mind map was created for the effective time management topic. The central node contained the major topic, Effective Time Management. Branches connected the central node to nodes containing major areas to be covered. Sub-nodes under these major nodes held topics and sub-topics related to these major areas. After constructing this mind map, the structure was further refined by combining and connecting related or similar nodes in the map. Using this mind map, the major structure of the module was determined. Then, storyboards were used to develop each screen the participants would see. Storyboarding, in simple terms, is a basic technique used to draft or sketch what a visual communication element, (e.g. a photograph, a movie scene, a single screen of computer presentation, etc.), will contain. Storyboards consist of several, usually simple sketches showing sequential visual communication elements (e.g., several scenes from the movie, sequential slides, etc.). Finally, flash animations were produced based on these storyboards. The first module did not contain a lot of practice exercises. It mainly consisted of informative reading material and sample practice questions spread out among the readings. The content of the training program is presented below.

Table 2.2: Activities in Effective Time Management Module

Activity	Name	Description
1	Training Plan	Describes the order of presentation of the content of the training
2	Test - Current Knowledge (pre-test)	Measures knowledge level in time management topic
3	Test - Current Status (pre-test)	Measures current status in time usage
4	Introduction to Time Management	Presents knowledge and facts (i.e., declarative knowledge) concerning time management

Table 2.2: Activities in Effective Time Management Module (continued)

Activity	Name	Description
5	Current State in Time Management Skills	An exercise recommended to determine current way of time usage
6	Basic Time Management Principles	Presents information on principles for managing time
7	Planning	Presents information about planning
8	Goals	Explains what goals are and how to set them
9	Weekly and Daily Planning	Shows how to make weekly and daily plans
10	Points to be Careful About While Planning	Notes critical points
11	Common Time Management Mistakes	Presents widely seen mistakes and shows ways to avoid them
12	Time Robbers	Lists several sources of time waste and ways for avoiding them
13	Application to Daily Life	Summarizes all the content and shows ways to apply the newly learned skills to daily life
14	Assessment of Time Usage	Helps the participant evaluate the way s/he uses time
15	Test - Knowledge Level (post-test)	Measures knowledge level in time management topic
16	Test - Achieved Status (post-test)	Measures achieved status in time usage

The fifth activity, Current State in Time Management Skills, had a timed relation with the fourteenth activity, Assessment of Time Usage. The fourteenth activity could only be taken at least one week after the first completion of the fifth activity. This relation, similar to other relations in other modules, was enforced in

order to motivate the participants to carry on a practice presented in the fifth activity, for one week. However, the practice was not dictated to be completed, it was at the discretion of the participant.

2.4.1.2. Fast and Effective Reading

The second module in the training program was Fast and Effective Reading. This module was devised to provide the information necessary for improving reading as well as to give the participant some opportunity to apply this information. This module was developed as two separate parts: Part I: Fast Reading and Part II: Effective Reading. These parts were developed so that they could be undertaken at the same time. The development of these parts, like the Effective Time Management Module, was carried out by collecting information, building mind maps, preparing storyboards and creating the software. Firstly, a wide variety of resources were examined. Secondly, the module and its parts were structured using mind maps. Then, the storyboards were prepared and the applications were designed. Next, content to be used in the exercises and tests was prepared. Finally, everything was transferred to flash animations to be presented over Internet

Part I: Fast Reading

The first part aimed at improving reading speed of the students. It began by presenting information regarding reading speed and factors affecting it, and then provided applications to use this information. Based on Van Merriënboer et al.'s (2002) 4C-ID model, the main information related to reading speed was provided at the beginning of this part as supportive information. Information regarding more recurrent aspects of reading speed and related factors, however, were provided one by one and were followed by appropriate practice exercises. For example, information regarding eye-span and speed of information perception was followed by two exercises to improve these skills.

The Fast Reading part started with reading speed test. It consisted of three different texts with different difficulty and attractiveness ratings (the rating process for the texts will be explained below). The texts were ordered from easiest to hardest to read. At the end of this part, there were three more texts to measure the

reading speed, ordered in the same fashion. After the pilot study, an automatic check to make sure that the reader (the participant) did not click the finish button by mistake was added at the end of the test application. Once the reader finished reading the text, the test application checked the reading speed and if it was too high (i.e. above 800 wpm) it warned the user and asked whether a mistake had occurred or not. It also provided an option to go back and continue reading in case of a mistake. The list of activities in the fast reading part is given below.

Table 2.3: Activities in Fast Reading Part

Activity	Name	Description
1	Training Plan	Describes the order of presentation of the content of the training
2	Introduction to Reading Speed Measurement Interface	Introduces the interface of the software for reading speed measurement and explains its usage
3	Reading Speed Measurement - 1	Speed test (pre-test)
4	Reading Speed Measurement - 2	Speed test (pre-test)
5	Reading Speed Measurement - 3	Speed test (pre-test)
6	Basic Information Regarding Speed Reading	Presents facts and principles concerning speed reading
7	Main Factors Affecting Reading Speed	The factors affecting the reading speed are presented
8	Vocal Reading	Sub-vocalization is explained
9	Introduction to Silent Reading Exercise Interface	Introduces the interface of the software for silent (without sub-vocalization) reading exercises and explains its usage
10	Silent Reading Exercises	Practice in silent (without sub-vocalization) reading
11	Eye Span and Speed of Perception	The concepts of eye-span and perception speed are explained

Table 2.3: Activities in Fast Reading Part (Continued)

Activity	Name	Description
12	Introduction to Eye Span and Speed of Perception Exercise	Introduces the interface of the software for the first type of eye span and perception speed improvement exercises and explains its usage
13	Eye Span and Speed of Perception Exercise	First type of exercises for improving eye span and perception speed
14	Introduction to Eye Span and Speed of Perception Exercise - 2	Introduces the interface of the software for the second type of eye span and perception speed improvement exercises and explains its usage
15	Eye Span and Speed of Perception Exercise – 2	Second type of exercises for improving eye span and perception speed
16	Backtracking and Movement Speed of the Eye	Backtracking is explained along with the movement speed of the eye
17	Introduction to Increased Speed Reading Interface	Introduces the interface of the software for the Increased Reading Speed Exercise and explains its usage
18	Increased Speed Reading Exercise	Exercise specifically designed to improve the reading speed by forcing to read faster
19	Sample Application Plan	An application plan for all the practice exercises over a 21-day period.

Table 2.3: Activities in Fast Reading Part (Continued)

Activity	Name	Description
20	Reading Speed Measurement - 4	Speed test (post-test)
21	Reading Speed Measurement - 5	Speed test (post-test)
22	Reading Speed Measurement - 6	Speed test (post-test)

Fast reading part contained several timed relations between activities, like the one in effective time management module. These relations were enforced in order to motivate the participants to do the practice exercises during the period when the next activity could not be taken. The relations are given in the table below. The activity on the activity column could not be started before at least the time given in the time column has passed after the first completion of the activity in the prerequisite column.

Table 2.4: Relations between Activities in Fast Reading Part

Activity	Prerequisite	Time in Between
Eye Span and Speed of Perception	Silent Reading Exercises	1 Day
Introduction to Eye Span and Speed of Perception Exercise - 2	Eye Span and Speed of Perception Exercise	1 Day
Backtracking and Movement Speed of the Eye	Introduction to Eye Span and Speed of Perception Exercise - 2	3 Days
Reading Speed Measurement - 4	Sample Application Plan	21 Days
Reading Speed Measurement - 5	Sample Application Plan	21 Days
Reading Speed Measurement - 6	Sample Application Plan	21 Days

The fast reading section contained an exercise, in which words with differing lengths were flashed at the screen and the participant was required to see it. For

this exercise, words from Turkish dictionary were selected and a list was built, and then the application displayed words chosen from this list randomly. The word list was built by comparing two online dictionaries and selecting the matching words then eliminating any words which were mentioned as “informal/slang/rude” in the dictionaries. Finally, the two student assistants helping the researcher checked the list of words evaluating each word for its suitability to be used in the current study. These two students were considered to be typical METU students and as such it was expected that their judgments would approximate judgments of typical students. The word list contained 10,639 words at the end.

Many texts were used in the practices and tests in the fast reading part. These texts were chosen after searching various sources including popular scientific journals, contemporary and classical Turkish literature, and translations of many foreign books, and then, extracting texts or parts of texts. The two student assistants helped the researcher by scanning these resources for appropriate texts. After selecting around 50 texts, these texts were evaluated and rated by these two students and by the researcher in terms of overall suitability as well as difficulty and attractiveness. Some texts were eliminated because they were inappropriate. The remaining texts were rated for their difficulty and attractiveness. Each text was rated for difficulty and attractiveness, ranging from 1 to 3, 1 being low and 3 being high for both scales. Finally, the average of three ratings for each text on both difficulty and attractiveness was taken and used. The difficulty was determined based on the use of jargon, sentence structure and the length of the sentences and the paragraphs. The attractiveness was rated based on the subjective opinions of the raters.

Fourteen of the selected texts were chosen to be used in the fast reading part and five were chosen to be used in the effective reading part. Additionally, six were used for reading speed test during the training and three were used at the end of the whole program. Four texts were used for effective reading tests during the training and two were used at the end of the complete program. The major difference between the texts for these parts was the number of words. The texts for fast reading part contained around 1000 words to provide quick exercises. The texts for effective reading part contained around 2500 words to provide a broader scope for potential questions. Permission to use the selected texts in this study was

requested from respective copyright holders by sending them letters signed by department chair.

Part II: Effective Reading

The second part aimed to improve the effectiveness of reading so that the combined effect of the two parts of the reading module would be increased comprehension with higher reading speeds. This part provided information regarding what should be done before, during, and after reading to improve comprehension and retention. It also included a brief introduction to mind maps to improve retention of information by note taking. After providing all the details and techniques, reading practices were provided for the participants to apply their newly gained information. The practices consisted of different texts with different difficulty and attractiveness ratings, followed by questions measuring the level of comprehension and retention. The texts were chosen as explained in Part I: Fast Reading. The questions were developed as explained earlier in the measures section. The activities in this part are listed below.

Table 2.5: Activities in Effective Reading Part

Activity Name		Description
1	Training Plan	Describes the order of presentation of the content of the training
2	Introduction to Effective Reading Interface	Introduces the interface of the software for the effective reading test and explains its usage
3	Effective Reading Test - 1	Test for reading comprehension (pre-test)
4	Effective Reading Test - 2	Test for reading comprehension (pre-test)
5	Mind Maps	Brief description and examples for usage of mind maps
6	General Reading Strategies	Presentation of the general strategies for better reading
7	Things to be done before Reading	Information regarding what to do before reading to improve comprehension

Table 2.5: Activities in Effective Reading Part (Continued)

Activity	Name	Description
8	Details to be cared about while Reading	Information regarding what to do during reading to improve comprehension
9	Things to be done after Reading	Information regarding what to do after reading to improve comprehension
10	Recommendations for Effective Reading	General recommendations to improve reading skill
11	Effective Reading Practice	Practice exercises to apply newly acquired skills
12	Effective Reading Test - 3	Test for reading comprehension (post-test)
13	Effective Reading Test - 4	Test for reading comprehension (post-test)

There were time constraints between some of the activities in this part. Effective reading practice, the eleventh activity, could not be started before at least 1 day had passed after the first completion of the first effective reading tests (i.e., Activities 3 and 4). The last two effective reading tests (i.e., Activities 12 and 13) could not be started before at least seven days had passed after the first completion of the effective reading practice, Activity 11.

2.4.1.3. Active Use of Memory

The final module was designed to improve the skills of the participants in actively using their memory. Similar to other modules, after a review of the relevant literature, structuring of the content and preparation of the storyboards, the training was transferred to Internet ready format. The module contained general information regarding the use of memory and also specific techniques for remembering information. After presenting techniques for remembering lists, related practices for the students to apply their new knowledge was provided. Similarly, after presenting techniques for remembering numbers, related practices were given. At the end, practices were provided for the integration of all techniques together. The module ended before the final tests by providing

information on how to apply the techniques to daily life and therefore providing a context. The list of activities in this module is given below.

Table 2.6: Activities in Active Use of Memory Module

Activity	Name	Description
1	Training Plan	Describes the order of presentation of the content of the training
2	Free Recall Test	Test for measuring the skill level in free recall (pre-test)
3	Ordered Recall Test	Test for measuring the skill level in ordered recall (pre-test)
4	Number Recall Test	Test for measuring the skill level in recalling numbers (pre-test)
5	Paired Recall Test 1	Test for measuring the skill level in paired recall (pre-test)
6	Paired Recall Test 2	Test for measuring the skill level in free recall (pre-test)
7	Basic Information	Presentation of basic knowledge and facts regarding memory
8	Basic Principles	Presentation of basic principles of memory use
9	General Techniques and Methods	General techniques for better recall
10	Mnemonic Techniques	General introduction to mnemonic techniques
11	Peg Systems	Information about the peg systems
12	Techniques for Recalling Lists	Specific mnemonic techniques for recalling lists

Table 2.6: Activities in Active Use of Memory Module (continued)

Activity	Name	Description
13	Connection/Story System	General information about and guidelines for the use of the mnemonic technique
14	Method of Loci	General information about and guidelines for the use of the mnemonic technique
15	Roman Room System	General information about and guidelines for the use of the mnemonic technique
16	Alphabet Method	General information about and guidelines for the use of the mnemonic technique
17	Explanation for List Recall Exercises	The exercises for practicing mnemonic techniques for recalling lists are explained
18	List Remembering Exercises 1	The exercises for practicing mnemonic techniques for recalling lists
19	List Remembering Exercises 2	The exercises for practicing mnemonic techniques for recalling lists
20	Free Recall Test	Test for measuring the skill level in free recall
21	Ordered Recall Test	Test for measuring the skill level in ordered recall
22	Techniques for Recalling Numbers	Specific mnemonic techniques for recalling numeric data
23	Similar Look System	General information about and guidelines for the use of the mnemonic technique
24	Similar Sound System	General information about and guidelines for the use of the mnemonic technique
25	Major System	General information about and guidelines for the use of the mnemonic technique

Table 2.6: Activities in Active Use of Memory Module (continued)

Activity	Name	Description
26	Explanation for Number Recall Exercises	The exercises for practicing mnemonic techniques for recalling numeric data are explained
27	Number Recall Exercises 1	The exercises for practicing mnemonic techniques for recalling numeric data
28	Number Recall Exercises 2	The exercises for practicing mnemonic techniques for recalling numeric data
29	Number Recall Test 1	Test for measuring the skill level in recalling numbers
30	Number Recall Test 2	Test for measuring the skill level in recalling numbers
31	Application of Memory Techniques to Daily Life	Guidelines and examples for applying the recall techniques in daily life
32	Explanation for Paired Recall Exercises	The exercises for practicing mnemonic techniques for recalling paired information are explained
33	Paired Recall Exercises 1	The exercises for practicing mnemonic techniques for recalling paired information
34	Paired Recall Exercises 2	The exercises for practicing mnemonic techniques for recalling paired information
35	General Recall Exercises	General exercises for applying a multitude of previously learned techniques
36	Free Recall Test	Test for measuring the skill level in free recall (post-test)

Table 2.6: Activities in Active Use of Memory Module (continued)

Activity Name		Description
37	Ordered Recall Test	Test for measuring the skill level in ordered recall (post-test)
38	Number Recall Test	Test for measuring the skill level in recalling numbers (post-test)
39	Paired Recall Test 1	Test for measuring the skill level in paired recall (post-test)
40	Paired Recall Test 2	Test for measuring the skill level in paired recall (post-test)

There were three time based relationships in this module. First, the free recall test, Activity 20, could not be taken before at least two days had passed after first completion of the explanation for list recall exercises, Activity 17. Second, it was not possible to start number recall tests, Activities 29 and 30, before at least two days had passed after completion of the explanation for number recall exercises, Activity 26. Third, the final tests, activities from 36 to 40, could not be started before at least two days had passed after completion of the application of memory techniques to daily life, Activity 31. These relations were enforced in order to motivate the participants to do the practice exercises during the period when the next activity could not be taken. However, participants were not forced to practice.

This module was not included in the final analyses, because, as explained in results chapter, there were only two participants who completed this module at the time of the analyses.

2.5. Procedure

2.5.1. Overview

The first step in the study was the development or translation/adaptation of the individual difference factors measures. When these measures were brought together, a pilot application of them was carried out. At the same time, the

Learning Management System software was developed. Next, the training program was produced. After these ingredients were ready for a test run, the training pilot study was carried out. Following this pilot study, necessary revisions were made to the software and the training content. When everything was ready for the main application, participants were recruited. Informed consent of the participants was obtained before they registered. The informed consent form can be found in **Appendix R**.

A pretest battery containing both the individual difference factor measures and the tests related to training program (tests for measuring the skill and knowledge level in time management, reading speed, comprehension level and memory use) was administered to all participants and this pretest battery was a prerequisite for taking the training. The participants could not start the training without taking these tests. After the registrations were closed, the participants were randomly divided into two groups, the experimental group and the waiting list control group. Next, the students in the experimental group started the training. All relevant information regarding this training process (i.e. the times of logins, the times and frequencies of undertaking training activities, and the scores obtained on practice exercises and on tests) was monitored and recorded for each participant. After the designated time for the training program was completed for the experimental group, a post-test battery containing the scales in the pre-test and a change scale for the learning-self efficacy was applied to measure any changes that occurred during training. At the same time, the same test battery was applied to the waiting list control group as the pretest before they began the training. Finally, the control group began the training.

2.5.2. Development of the Measures

As explained earlier, there were three scales to measure individual differences characteristics of the participants as well as a number of tests to measure the effects of the training on knowledge or attitude of the participants. The Learning Self Efficacy Scale was developed by the researcher himself based on the guidelines by Bandura (2005). The second scale, the Goal Orientation Scale, was translated from the original English version into Turkish and two items

were added by the researcher. The third scale was the Turkish translation of the Big Five Inventory, translated earlier by Sümer et al. (in press).

The tests measuring the success of training were developed along with the content of the training program. After collecting the information for the content and structuring the instruction, tests were created to measure any changes in the knowledge or skills caused by the information presented up to that point.

2.5.3. Development of the Learning Management System (LMS)

The LMS was developed by the researcher from scratch. The development process began by the examination of the documents for the SCORM 2004 standard (Dodds & Thropp, 2005; Dodds & Thropp, 2004; Dodds & Thropp, 2004-2; Dodds & Thropp, 2004-3). The SCORM 2004 standard was used as the major source for formulating the details of the LMS, such as the way the LMS would collect and record information, present the training content and log any information regarding the users' interaction with that content. The software was developed using PHP programming language with MySQL software as the database. At the beginning, SCORM 2004 was the targeted standard to be supported by the system. However, as it required a lengthy development process, it was necessary to change this goal. The new aim was that the LMS would have only the features that were necessary for current study and thereby it could be completed faster. As a result, SCORM compatibility is not a feature of the system; however, the main features were guided by that standard. The communication between the training materials and the LMS was based on a simplified version of the specifications of this standard. Additionally, the relationships between the parts of the modules (i.e., the activities in the modules) were defined using a simple method derived from SCORM's sequencing information.

2.5.4. Individual Difference Factors Scales Pilot and Training Pilot

In the first pilot study, the three individual differences scales were administered to a sample of 94 undergraduate students. The goal orientation scale was also modified to contain questions regarding both mastery and performance goal orientation. Detailed information regarding measures was presented earlier in the measures section, so further explanations can be found there. In this pilot

study, different measures had different rating scales. However, following the pilot study, a decision was made to convert all the scales into a 5-point Likert type, consistent with the suggestions of Ergin (1992).

The second pilot study included the application of the first two modules (i.e., Effective Time Management and Fast and Effective Reading) modules of the training program. The program was administered to a total of 47 students taking Industrial Psychology Course during 2005-2006 fall semester. They received experimental credit for their participation in the training. The credit was given based on the proportion of the training completed.

2.5.5. *Main Study*

After completion of the second pilot study, the work towards main study began. Any errors found during the pilot study were corrected. Improvements based on feedback from participants were made. The development of the third module continued.

2.5.5.1. Recruitment

When the system was ready for the main study, the recruitment process of the trainees for the program began. A poster was prepared to be posted at different locations in the campus. The major flow of applicants, however, happened following the online announcement of the training at the university's web site. Not only METU students and personnel, but also former graduates and people outside METU were interested and requested to take part. The participants with an e-mail address having "metu.edu.tr" extension subscribed themselves over the web site. Other people willing to participate were subscribed by the researcher himself. They sent their information via e-mail. Each participant asked to read and, if it is ok, to sign an informed consent form before signing-up for the program (**Appendix R**). At the end of the registration period, a total of 597 participants registered for the study.

2.5.5.2. Pre-test

All the participants, who registered for the program, were required to take the pre-test battery in order to be eligible to take the training. The pre-test battery

contained the individual difference factor scales. The pre-test for the instructional material, i.e. the knowledge and skill tests, were applied at the beginning of each module.

2.5.5.3. Assignment of the Participants into the Experimental and the Waiting List Control Groups

The participants were randomly divided into experimental group and control group. The experimental group immediately began the training program, while the control group waited until they completed the training. The students in the waiting list control group were told that the technical capacity of the system was not able to serve that many students at one time and therefore they had to be divided into two groups. The control group was given a choice of beginning the training immediately after the experimental group completed (i.e. during the summer) or the fall term. Two hundred sixty one of the 593 students were included in the experimental group and 332 were included in the control group. The higher number in the control group was due to the fact that because of time limitations, the training had to begin before registrations were completed. The students who registered before the training began (a total of 498) were grouped randomly, resulting in 261 participants in experimental group and 236 in control group. The remaining 96 students registered after the training began and therefore were included in the control group.

In the course of the training, four participants requested to be left out of the study and therefore their information was not used. As a result, there were 589 participants in the end.

2.5.5.4. Training and Monitoring

After the assignment of the participants into the experimental and the waiting list control groups, participants in the experimental condition started the training program; they took the modules explained earlier in the training program section in the order they were presented. They were allowed to start a module only after completing the module before it. However, two parts of the reading module could be taken simultaneously. While the participants were taking training, all required information including the time spent in the system, the number of

attempts on any activity, the status of activities and modules, and the test scores was recorded by the system.

2.5.5.5. Post-test

After the designated time for the training program has ended for the experimental group, a post-test was administered. Due to the time limitations of the study, some participants took the test before they completed the training program. Post-test was fundamentally the same test as the pretest, it contained individual difference factors scales and scales for measuring the knowledge and skills of the participants in the areas contained in the training program. Only some content in the post-test (e.g., the reading materials) was different than that of pre-test. Also, tests for the training content, i.e. knowledge and skill tests, were applied both at the end of each module specifically for that module, and at the end of the whole program, for all modules. Waiting list control group took the same test, excluding the learning self-efficacy change items. This test was administered to them as the pre-test before they began training.

CHAPTER 3

RESULTS

3.1. Overview

In this chapter, first, operational definitions of the variables (both independent and dependent variables) of this study are presented. Next, a description of the analyses carried out to test the hypotheses of the study is provided. Third, descriptive statistical information concerning the completion rates of the different modules of the training program is presented. Finally, results of the analyses testing the hypotheses of the study are given.

3.2. Operational Definitions of Variables

The independent variables of the study are the three individual difference scores (i.e., mastery goal orientation level, conscientiousness level, and learning self-efficacy level) and completion rate, since it is expected that completing the program will affect the learning-self efficacy level of the participants. In the present study, these scores were used as continuous variables. The three individual difference scores were measured using 5-point Likert type scales. The average scores on each measure were used as the individuals' score on that variable. Completion rate of the program was determined by dividing the number of all activities completed by an individual by the total number of available activities and it was expressed in terms of percent completion rate. Percent completion rate was also used as a continuous variable in the analyses.

The dependent variables of the study were change in knowledge level, change in skill level, practice level, and also self-efficacy and completion rate (both of which were also treated as independent variables). The changes in knowledge and skill level were measured by the difference in the knowledge and skill tests performance applied at the onset and end of the training modules. The

scores on these tests were directly used without any combination or recalculations. Each test had a different scoring schema. For example, while the comprehension test had scores ranging from zero to 100, the reading speed test had scores ranging from 50 to 1000, so each test was compared separately for individuals.

The participants were presented practice exercises to facilitate the knowledge they have gained. Practice level for each practice exercise was determined by the number of times that practice was undertaken by the participant. In order to avoid the inflation in the practice level scores, first 10 attempts on each practice was assigned one point each, following attempts were assigned half points. As some practices took longer to complete, a decision was made to use differential weighting in calculating total practice level score. Practice level was also a continuous variable. Detailed information about the scoring of practice level for different practice exercises is provided below.

3.2.1. Scoring Practice Levels

In this section, differential weights used for each practice exercise in calculating the overall practice score of the participants are explained. There were four practice exercises for the Fast Reading Part of the Fast and Effective Reading Module (i.e., Silent Reading Exercise, Eye Span and Speed of Perception Exercises I and II, and Increased Speed Reading Exercise) and one for the Effective Reading Part (Effective Reading Practice).

Silent Reading Exercise aimed to help the participants stop sub-vocalization. To achieve this aim, it presented a text to the reader and the reader had to read the text while engaging her/his vocal channels with a different task (e.g., counting from one to ten, repeating a sound like “mmm”) so that s/he could not vocalize the material that was being read. The exercise only required reading the text. The texts were around 1000 words each. There were a total of fourteen texts, and each could be used as many times as the participant wanted.

Eye Span and Speed of Perception Exercises I and II aimed to increase the eye span as well as perception speed of the participant. In the first group of these exercises, two characters on both sides of a line on the screen were presented. The participant was required to see the characters, which could be numbers or letters, and to write them when asked. The distance between the characters increased,

while the duration of their presentation decreased over time. It was possible to improve from the first level (where the characters were the closest) and longest presentation (i.e., where the characters were displayed for the longest duration) to the 28th level (where the characters were farthest apart) and shortest presentation (i.e., where the characters were displayed for the shortest duration). Each time the exercise was undertaken, 18 pairs of characters were shown. Correct answers moved the participant to higher levels and shorter durations, while incorrect answers moved the participants to lower levels and longer durations. A participant had to repeat the exercise at least 30 times without mistakes to reach the highest possible level and the shortest duration. Then s/he could continue to do exercise trying to keep at that level. In the second group of Eye Span and Speed of Perception Exercises, the practice was very similar, with the exception that instead of two characters, a word or group of words was presented on the screen. The difficulty level was increased by increasing the length of the word or adding more words. The duration of presentation was shortened the same way as it was in the first group of exercises. There were 13 difficulty levels and four different display durations. In total, a participant had to repeat the exercise around 20 times without a mistake in order to reach the highest level and shortest presentation duration. Then s/he could continue to do exercise trying to keep at that level.

Increased Speed Reading Exercise was applied to increase the reading speed of the participant. It forced the participant to read faster by highlighting the words to be read and moving the highlighted section forward. The number of words that were highlighted increased while the duration they were highlighted decreased to move the reading speed up. The system automatically increased the speed while the participant progressed. The participant was also able to increase or decrease the speed. The highest speed that could be reached in this exercise was 1000 words per minute. Seventeen different texts were used for this exercise. Length of each text was around 1000 words. The texts could be reused for practice.

Effective Reading Practice composed of two parts. In the first part, a text with a length around 2500 words presented. In the second part, questions to measure comprehension of the text were asked. There were a total of five texts for this exercise and they could not be repeated, since the comprehension level for a

text in subsequent readings would be highly affected by the first reading. Therefore, the effective reading practice could be undertaken five times.

Based on the information presented above, each practice exercise was given a differential weight to account for the differences in difficulty, appeal, and its length. The exercises for eye span and reading comprehension were given a weight of 1, since they were short and easy to do. The increased speed reading exercise was assigned a weight of 2, as it was longer than the eye span exercises but it also showed the progress clearly thus making it appealing. The silent reading exercise was assigned a weight of 3 because it was lengthy and it did not show the improvement of the participant, i.e., the participant had to see the improvement herself/himself. Finally, the effective reading practice was given a weight of 7 because it was more than twice as long as silent reading or increased speed reading and it could be done five times only. The weight 7 made it possible to acquire a total of 35 points from this exercise, while someone who did the silent reading exercises once with each provided text (i.e., 14 times in total) would acquire a total of 36 points. Scores on the practice levels were multiplied with these predefined coefficients while calculating the practice level composite score.

3.3. Analyses

In order to investigate the success of the online instruction and to test the hypotheses of the study, following analyses were carried out.

3.3.1. Hypothesis I

Developed online training program will have positive outcomes in terms of selected criteria from Alliger et al. (1997),

- a) Students who attend the online training program will demonstrate acquisition of knowledge in the immediate measurements.*
- b) Students who attend the online training program will demonstrate increase in their skills in the training context.*

In order to test both parts of the first hypotheses the pre- and post-test scores on knowledge and skill tests of participants were compared using paired t-test.

3.3.2. Hypothesis II

Mastery goal orientation level of the students will predict the practice level undertaken.

Simple linear regression was used to test the second hypothesis. The practice level of participants was used as the dependent variable and the mastery goal orientation level of the participants was treated as the independent variable.

3.3.3. Hypothesis III

Mastery goal orientation level of the students will have positive relationship with the training outcomes.

a) *Mastery goal orientation will predict the acquisition of knowledge in immediate measurements.*

b) *Mastery goal orientation will predict the increase in skill level in the training context.*

Simple linear regression was used to carry out this test. Change scores between pre- and post-test for knowledge and skills were regressed on mastery goal orientation.

3.3.4. Hypothesis IV

Learning self-efficacy level of the students will predict the practice level undertaken.

Simple linear regression with learning self-efficacy level of the students as the independent variable and the practice level as the dependent variable was used to test the fourth hypothesis.

3.3.5. Hypothesis V

Conscientiousness level of the students will affect the involvement of students in the program.

a) *Conscientiousness level of the students will predict level of practice*

b) *Conscientiousness level of the students will predict completion rate.*

Fifth hypothesis was tested by comparing a) the practice level of the participants, and b) the completion rate of the program, based on the

conscientiousness of the participants. These comparisons were carried out through simple linear regression.

3.3.6. Hypothesis VI

Completing the training program will increase the learning self-efficacy level of the students.

The last hypothesis was tested using simple linear regression and treating the completion rate of the program as the independent variable and the change in the learning-self efficacy level of the participants as the dependent variable.

3.4. Basic Descriptive Statistics about Program Completion

The interest in the program was originally high. However, the number of students who continued the program was considerably low. For example, a total of 207 participants started at least one activity and 202 finished at least one activity. One hundred and forty nine participants completed 10 or more activities out of 88 activities. Number of participants with different degrees of involvement in the program can be seen in **Table 3.1**. It is important to note that in the following tables of this section, the two parts of the Fast and Effective Reading Module are treated as separate modules. Therefore, the presented results include three “modules”: “Effective Time Management,” “Fast Reading,” and “Effective Reading.” As mentioned earlier in the method chapter and explained later, due to low number of participants who completed the “Active Use of Memory” Module, it is left out of most analyses.

Table 3.1: Number of Participants Completing Different Amounts of the Training

Description	Number of Participants
Number of participants who started the program (who started at least one activity)	207
Number of participants who finished at least one activity	202
Number of participants who completed the program*	24
Number of participants who completed at least one Module	120
Number of participants who completed one module	87

Table 3.1: Number of Participants Completing Different Amounts of the Training (continued)

Description	Number of Participants
Number of participants who completed two modules	7
Number of participants who completed three modules	24
Number of participants who completed four modules**	2
Number of participants who did not start any activity	282

* Number of participants who completed the Module “Effective Time Management” and both parts of the Module “Fast and Effective Reading”

** Since two parts of the Fast and Effective Reading Module were treated as modules, there were a total of four modules

In terms of completion of activities, the situation is no better. For example, out of 593 participants who applied for the instruction program, a total of 120 participants completed the Effective Time Management Module. **Table 3.2** presents the number of participants who started and who completed each module.

Table 3.2: Number of participants who started and completed each module

Module	Number of Participants who Began	Number of Participants who Completed
Effective Time Management	202	120
Fast and Effective Reading		
<i>Part I: Fast Reading</i>	115	28
<i>Part II: Effective Reading</i>	67	31

The numbers in **Table 3.1** and **Table 3.2** clearly show that the completion rate of the program was quite low. Potential causes for these low rates are explored

in the discussion chapter. As stated before, due to the extremely low completion rate for the Active Use of Memory Module, this module was excluded from the analyses. The term “instructional program,” or just “the program,” from now on, means the “Effective Time Management Module” and the “Fast and Effective Reading Modules.”

Furthermore, the number of participants who started a module and number of participants who completed a module were drastically different. For example, a total of 202 people started the Effective Time Management Module while only 120 of that completed the module. A similar drop in numbers can be seen for the other modules in **Table 3.2**.

Table 3.3 presents percent completion rates for the modules. The percent completion rates were calculated as such: The number of activities completed by each individual is divided by the total number of activities in that module. Then this percent is averaged over all participants used for the calculation for that specific module. This calculation left out all participants but the ones who at least completed one activity from the module. Therefore, the number of participants used in the calculations differed for each module.

Table 3.3: Percent Completion Rates

Module	Average Percent Completion Rate	Highest Percent Completion Rate	Number of Participants
Effective Time Management	76.69	100	201
Fast Reading	66.03	100	114
Effective Reading	74.08	100	65
Whole Instructional Program	45.08	100	201

The individual difference measures were filled at the very beginning of the instructional program. Also the participants who took part in the pilot application of the online instruction program did respond to the scales. Information from all

participants who filled the scales was used to carry out the basic analyses (i.e., inter item correlations and the cronbach's alpha values) on the scales.

For the learning-self efficacy scale, there were a total of 437 cases at the beginning. Twelve of these cases had seven missing values, and missing values were from the ninth to fifteenth item for all of these cases. This non-random pattern was due to a software problem in presenting or recording these items. Therefore, these cases were deleted, leaving 425 participants. Then the reverse items (second, fifth, eleventh, twelfth and fourteenth items) were recoded.

Two iterations of outlier checks were run using z-scores for univariate outliers and mahalanobis distances for multivariate outliers. In the end, there were a total of 41 univariate and 18 multivariate outliers. All outliers were deleted leaving 366 cases. Then, the cronbach alpha value for the scale was calculated and was found to be .86, well above the acceptable .7 level.

For the goal orientation scale, there were a total of 425 cases at the beginning. Three of the cases had ten missing items (items between nine and eighteen) and five of the cases had two missing items (Item 17 and 18). Since the missing values were non-random, again caused by technical error, these cases were deleted. Four hundred and seventeen cases remained. The reverse items (Item 10 and Item 17) were recoded. The check for univariate and multivariate outliers revealed a total of 25 univariate and five multivariate outliers. Deleting these cases left 387 cases. The cronbach's alpha value at this point was .66, which is below the acceptable level. This, however, was not surprising, since the scale was intended to measure two factors: *mastery goal orientation* and *performance goal orientation*, which are stated to be different constructs. Therefore, a separate check for each factor seemed more reasonable. The items for performance goal orientation yielded a cronbach alpha value of .67. The alpha value for the mastery goal orientation scale was .84, which was satisfactory.

There were initially 419 cases for the Big Five Inventory. Twelve of these cases had missing values. Eight of the cases had the last four items missing. The others had five, eight, twelve and twenty missing values. The last four items were missing in all cases. This situation was another result of the technical problem that caused the scale responses to be recorded incompletely. These cases were deleted. This left 407 cases for further analyses.

The cases were then screened for univariate and multivariate outliers. Removing 21 univariate and 13 multivariate outliers left 373 cases for the reliability analysis. The cronbach alpha value for the whole scale was .74. The cronbach alpha for the items measuring conscientiousness, the main interest of this study, was .81.

3.5. Hypothesis Testing

3.5.1. Overview

In this section, the results of the analyses testing the hypotheses of the study are presented. There was different number of cases for each different hypothesis due to the differing number of participants who completed the tests used in the hypotheses. Therefore, a general table of correlations, means and standard deviations could not be provided. Additionally, the presented means and standard deviation for the variables may differ from one analysis to the other, because different individuals and different number of participants are included in each analysis.

3.5.2. Hypothesis I

Developed online training program will have positive outcomes in terms of selected criteria from Alliger et al. (1997),

- a) Students who attend the online training program will demonstrate acquisition of the knowledge in immediate measurements.*
- b) Students who attend the online training program will demonstrate increase in their skills in the training context.*

In order to check whether Hypothesis 1 was supported, it was necessary to demonstrate that there was a difference between knowledge and/or skill level of the participants before and after taking the training. The initial intent of the study was to compare the experimental group and waiting list control group in order to determine whether there was a significant difference between their knowledge/skill levels at the end of the training. However, due to the low number of participants who completed the training modules, it seemed more appropriate to compare each participant's before and after score for each training module to determine whether

there was a significant difference. Hence, before and after scores of participants for each module was compared using paired t-test.

Whenever possible, pre-module and post-module assessments were used in the paired t-tests. However, for some participants, post-module measurements were not available (i.e., the student could not finish the tests before the training program was closed due to time restrictions). In such cases, assessment at the end of the training program was used instead of the post-module assessment. When examining the effects of a module on the related knowledge/skill, only those participants who completed that module were selected. This choice resulted in 120 cases for the Effective Time Management Module, 28 cases for the Fast Reading Module and 31 cases for the Effective Reading Module.

When the data (i.e., the pre- and post-test scores) from the database was transferred to SPSS, it was observed that for the Effective Time Management Module, there were three cases with no pre-module assessment of knowledge (possibly due to a technical failure because, technically it was not possible to start a module without taking the pre-test). These cases were deleted, leaving 117 cases. The before score had a mean of $M = 63.31$ ($S.D. = 12.96$) while the mean for the after score was $M = 80.39$ ($S.D. = 13.72$). To check the normality of the scores, skewness and kurtosis values were calculated. The before scores was acceptably close to a normal distribution. On the other hand, the after scores were significantly different from a normal distribution. A transformation could have been applied in order to make it more approximate to normal distribution. An appropriate transformation would be reversing the scores and then using their square root. However in that case, the comparability of the scores and the variance would have dropped significantly. Therefore, the paired t-test was carried out without transforming the data. The test results showed that there was a significant difference between pre-test and post-test scores ($t = -11.40$, $p = .000$, two tailed). This showed that there was a significant effect of the training on the score achieved from the test, i.e., the training improved the knowledge of the participant in the effective time management area, providing support for Hypothesis 1a.

Next, pre- and post-module scores on the effective reading and fast reading tests were compared. There were a total of 28 cases for the fast reading part (i.e., total number of participants who completed the module). The effect of fast reading

part was measured by calculating the reading speed of the participant in terms of words read per minute (wpm). To have a less error prone score, each time, three different texts were used and average reading speed for these three texts was used. There was one case, where the speed for one text was too high (10654 wpm) compared to the speeds on the other two texts (179 and 180 wpms). This was probably due to a mistake by the participant (for example, the participant may have clicked the finish button at the very beginning of the reading). Additionally, two participants had missing scores for one text in the “after” measurement. These missing scores and the high score were replaced with the mean of the scores on the other two tests by the same participant. The mean for “before” score was $M = 210.20$ ($S.D. = 106.53$). The mean of the “after” score was $M = 342.80$ ($S.D. = 142.30$). Then both the pre-test and post-test data were checked for normality. The scores were not normally distributed. In this case, since both scores were non-normal, a transformation was applied. Both scores were transformed using logarithmic transformation. After the transformation, the scores were acceptably close to normal distribution with $M = 2.29$ ($S.D. = .17$) for “before” score and $M = 2.50$ ($S.D. = .17$) for the “after” score. Then the paired t-test was run. It showed a significant difference between pre- and post-test scores ($t = -7.334$, $p = 0.000$, two tailed). These results support the conclusion that the training increased the reading speed of the participants, yielding some support for Hypothesis 1b.

Finally, the scores for effective reading part were analyzed. The scores for effective reading were calculated by providing the participant a text to read and then asking questions to measure comprehension. Similar to fast reading part, two texts were provided at each test and the average score of these two tests was used. There were no missing or extreme cases. The mean and standard deviance values were $M = 57.33$, $S.D. = 17.99$ and $M = 59.17$, $S.D. = 19.87$ for “before” and “after” scores, respectively. A check for normality showed that before and after score distributions were acceptably close to normal distribution. Therefore, the paired t-test was carried out without any further processing. The t test results failed to indicate that there was a significant difference ($t = -.490$, $p = .628$, two tailed). Summarizing all the test results, it can be concluded that Hypothesis 1a was supported. That is, the training program led to an increase in knowledge, while

Hypothesis 1b was partially supported. That is, the improvement in skill was apparent only for the fast reading part but not for the effective reading part.

3.5.3. Hypothesis II

Mastery goal orientation level of the students will predict the practice level undertaken.

The relationship between mastery goal orientation (MGO) and practice level was tested using regression analysis. The MGO was used as the independent variable (IV), while the practice level was the dependent variable (DV). The means for MGO and practice level were $M = 4.12$ (S.D. = .61) and $M = 57.61$ (S.D. = 65.06) respectively. The regression result showed that the relationship between MGO and the practice level was low ($r = .059$) and that the MGO did not explain a significant amount of variance in the practice level ($r^2 = .004$, $p = .563$). Therefore, Hypothesis 2 was not supported.

3.5.4. Hypothesis III

Mastery goal orientation level of the students will have positive relationship with the training outcomes.

- a) *Mastery goal orientation will predict the acquisition of knowledge in immediate measurements.*
- b) *Mastery goal orientation will predict the increase in skill level in the training context.*

Hypothesis 3 was tested using regression analyses. The MGO scores of the participants were used as the independent variable (IV) while the change score in knowledge or skill was used as the dependent variable (DV). The change scores were calculated by subtracting the scores on the pre-test from the scores on the post-test measuring the knowledge/skill level. The effect of mastery goal orientation on the training outcomes were separately examined for the Effective Time Management Module and the Fast Reading Module, but not for the Effective Reading Module since previous analyses has shown that there was no significant change between the pre and post modules scores for this module.

First, the relation between the MGO level ($M = 4.12$, $S.D. = .60$) and the Effective Time Management training ($M = 17.09$, $S.D. = 16.22$ for the post- pre-test difference score) was checked. The regression resulted in a low r value (.074). The r^2 value was also low, .005 ($p = .427$), indicating that the change in variance of the DV (i.e., the improvement in Effective Time Management Knowledge) was not explained by the MGO score).

Second, the test for the relation between the MGO score ($M = 4.05$, $S.D. = .74$) and the Fast Reading training ($M = 132.61$, $S.D. = 111.07$ for the post- pre-test difference score) was carried out. The regression once more showed that the relation between the MGO score and the training outcome was not significant ($r = .031$, $p = .877$).

Both tests showed that Hypothesis 3 was not supported, thus the MGO level of the participant did not predict the training outcomes in terms of knowledge and skill improvement.

3.5.5. Hypothesis IV

Learning self-efficacy level of the students will predict the practice level undertaken

Fourth hypothesis was tested by checking the relationship between the learning self-efficacy (LSE) of the students and the practice level undertaken. Linear regression was used to relate these two continuous variables. In this analysis the practice level ($M = 57.61$, $S.D. = 65.06$) was regressed on the LSE ($M = 4.07$, $S.D. = .68$). There were a total of 97 cases in this analysis. The results failed to support the hypothesis. That is, the LSE scores did not predict the practice level undertaken.

3.5.6. Hypothesis V

Conscientiousness level of the students will affect the involvement of students in the program.

a) *Conscientiousness level of the students will predict level of practice*

b) *Conscientiousness level of the students will predict completion rate.*

In order to test the Hypothesis 5, two regression analyses were run. In the first analysis, conscientiousness scores of the participants ($M = 3.68$, $S.D. = .64$) were used as the independent variable (IV) and the practice level ($M = 57.61$, $S.D. = 65.06$) as the dependent variable (DV). In the second test, conscientiousness scores ($M = 3.54$, $S.D. = .63$) were again treated as the IV, and completion rate of the program ($M = 45.62$, $S.D. = 33.17$) was entered as the DV. In the first analysis, there were a total of 97 cases. The relationship between the DV and the IV was insignificant ($r = .139$, $p = .176$). The variance in the DV explained by the IV was close to 2%. In the second analysis, there were 198 cases who completed at least one activity in the training program and who had responded to the Big Five Inventory. The results showed that the IV reliably predicted the DV ($p = .005$).

It can be concluded that conscientiousness level predicted the completion rate (Hypothesis 5b was supported), however, there was no reliable relation between the conscientiousness level and the practice level (Hypothesis 5a was not supported).

3.5.7. Hypothesis VI

Completing the training program will increase the learning self-efficacy level of the students.

In testing Hypothesis 6, the relationship between the completion rate and change in learning self-efficacy (LSE) level was examined. There were a total of 201 cases at the beginning for the analysis. However, some cases either missed a pre-test score or a post-test score on the LSE and thus they were eliminated. The analysis was conducted on 82 cases. The difference score on LSE was calculated by subtracting before value from the after value. The mean for the difference score was $M = .08$ ($S.D. = .70$) while the mean for the completion rate was $M = 60.73$ ($S.D. = 32.51$). The regression run showed that the completion rate did not reliably predict the change in the LSE scores ($r = .102$, $p = .360$). Hence, Hypothesis 6 was not supported.

CHAPTER 4

DISCUSSION

4.1. Overview

In this section, first, major findings of the study are briefly overviewed and discussed. Next, methodological limitations of the study are underlined. Finally, some recommendations for future research are made.

4.2. An Overview of the Results

The findings of the study supported only some of the hypotheses. The first hypothesis, stating that online instruction would improve knowledge and skills, was largely supported. More specifically, it was found that the Fast Reading and Effective Time Management modules improved the related knowledge and/or skills of the participants. These are promising findings, as they represent good reasons for development and application of further online instruction programs. However present findings do not represent complete evidence for the idea that online instruction is effective. Alternative explanations (i.e., threats to internal validity) need to be accounted for before safely attributing the observed effects to the online training program. In other words, in the absence of a control condition (in the form of no training and/or more traditional training programs), the observed effects cannot be safely attributed to the online training itself. Further research is required to compare online instruction and other kinds of instruction to show that online instruction, not just instruction, is successful. Since online instruction is an expensive way of training, it is important to know that it achieves the aim of improving the knowledge and skills of the users.

The second hypothesis, which stated that the mastery goal orientation (MGO) level would predict the undertaken practice level, was not supported. Similar to Brown's (2001) findings, the relationship between MGO and practice level was not directly observable. There might be other factors affecting this

relationship, i.e., there might be interactions between MGO and other factors. More specifically, as Brown (2001) suggests, there might be an interaction between goal orientation and learning self-efficacy. It is possible that self-efficacy level and mastery goal orientation level interact to determine the level of practice undertaken. As discussed below, learning self-efficacy level of the students also did not predict the practice level. Therefore, the potential interaction between goal orientation and learning self-efficacy might be the reason for the lack of support for the relevant hypotheses. It is also possible that, even conscientiousness, which alone did not predict the practice level, could have an interactive effect with one or both of these factors on practice level. Moreover, although not expected based on the literature reviewed, there could still be other factors, which have not been investigated in this study. These factors, mainly moderators, may play a critical role in the relationships between the outcome variables and MGO (and also between the outcome variables and learning self-efficacy and conscientiousness). Therefore, a further examination of MGO together with one or more of the mentioned factors or with other likely individual difference factors could provide more insight in the individual characteristics critical in determining the practice level.

MGO did not predict the level of knowledge and skill gains, thus, the third hypothesis was not supported. This result is reasonable, since MGO did not predict the undertaken practice level; it should not be expected to predict the gains as a result of the training. There is no other practical way through which MGO may affect or at least be connected to the level of knowledge and skill gains. The possible relation of MGO in predicting the knowledge/skill gains was by predicting the undertaken practice level and then assuming the relationship between practice level and the mentioned gains was predictive, i.e. the undertaken practice level would predict the knowledge/skill gains. However, even if the assumption that practice level predicts the gains is true, since MGO does not provide a reliable way of estimating the practice level, it is not possible to say that MGO would predict the knowledge/skill gains. Even though MGO provides information about the willingness of the participant to learn and/or master the learning material, MGO might not be enough to predict the gains by itself. Then, it is possible that the aforementioned factors which may be interacting to determine

the practice level, i.e., goal orientation, learning self efficacy, and conscientiousness, can be used together to predict the knowledge/skill gains.

Learning self-efficacy did not predict practice level, thus leaving the fourth hypothesis unsupported. This seems to be in conflict with Bouffard-Bouchard's (1990) findings. That study showed that students with high self-efficacy worked more practice problems than students with low self-efficacy. Current study, on the other hand, could not find such a difference. This, however, could be the result of the low standard deviation ($S = .67801$) and high mean ($M = 4.0722$) in the LSE scores of the students who took part in the study. The students who began the study were already the ones who had high self-esteem and thus, there was no observable difference between low and high LSE students' practice level. Indeed, it could have been concluded that it was not possible for current study to show that the possibility of relationship between LSE and practice level was beyond chance level, because of the range restriction on the LSE scores of the students. That is learning self-efficacy of the participants were in general high and self-efficacy did not have enough variability across participants to co-vary with the practice level. On the other hand, there was an apparent variability (more than expected, in fact) on the practice level variable ($SD = 65.058$) compared to its mean ($M = 57.61$). It seems plausible to argue that there were individual difference variables, other than self-efficacy, creating such variability in practice level of the student participants. Future research is needed 1) to examine the effects of self-efficacy on practice level using both similar and different samples and 2) to explore the other sources of variability in practice level.

Hypothesis 5 was partially supported. It was found that conscientiousness level of the participants predicted the completion rate of the program but not the practice level. This seems to be a reasonable outcome. Since conscientiousness trait leads to striving to achieve goals, it can be expected that the definition of the "goal" would affect the outcome. In the current study, it could be possible that the goal was "to complete the program," but not "to undertake a high level of practice" or "to maximize the gains." This approach may be valid for explaining current situation, in which case, it is acceptable that conscientiousness does not show a predictive relationship with practice level, if there is no explicit goal –defined

internally by the student, or specifically, externally by the instruction program-regarding the target level of practice.

Zimmerman et al. (1996) claimed that training in skills related to learning could lead to an increase in learning-self efficacy (LSE). The tests for the sixth hypothesis of the current study, however, did not support this claim. The completion rate of the program was not related to a change in LSE. It might be possible that undertaking the program and completing a basic level of it (e.g., 50%) has the mentioned effect on the LSE, so the relationship could be categorical, not reflected in the regression analysis. However neither a visual inspection of the results, nor an ANOVA run, by dividing the data into two categories at the 50% completion rate, supported this idea. The amount of variance explained was very low (0.1 %) and the relationship was insignificant ($p = .80$). Therefore, it seems reasonable to conclude that the LSE was not affected by the completion of such a training program. This again could be partially explained by the lack of variability on the efficacy measure.

The results showed that most of the hypotheses regarding the effects of personality factors on the success of online instruction were not supported. Nevertheless, observing the fact that most of the students who completed the training activities or knowledge/skill tests had high scores on mastery goal orientation and learning self efficacy, it can be claimed that the proposed effects were there, although not strong enough to be measured. At least a simple observation could be made about the dominant characteristics of the people who join and/or complete online instruction programs: These individuals tend to be high on both mastery goal orientation and learning self-efficacy. Therefore, it seems plausible to claim that individuals high on mastery goal orientation and learning self-efficacy are more likely to join and/or complete online instruction programs. Furthermore, the apparent lack of relevance of these factors in predicting practice level or knowledge and/or skill gains might be due to the fact that most of the data that was available was obtained from individuals high on both of these factors. Thus it might be the case that these factors do predict practice level and/or knowledge and/or skill gains but it was not noticeable in the current study due to the range restriction on the scores of students on these factors. Similarly, it can be argued that these two individual difference factors were also

relevant, even though weakly, to knowledge/skill gains because any participant who benefited from the program belonged to the groups with high average scores on both variables.

Further analysis was carried out to check the plausibility of other potential reasons for the differences between individuals in completion rates. In accordance with the suggestion of the thesis jury, the number of completed activities was compared based on the students' faculty/college and based on the students' graduate school/institute. The results are shown in Table 4.1 and Table 4.2 below. As it can be clearly seen, College of Engineering had a disproportionately high representation in terms of the total number of completed activities. In a similar fashion, Graduate School of Engineering had the highest number of participants among the institutes or graduate schools. Although Informatics Institute and Marine Sciences Institute seemed to have higher average number of completed activities, the number of people from those institutes were very low (two and one, respectively). Information in both tables seems to indicate that students from engineering area tended to be more interested in and to take part in the online instruction program developed. They also seemed to have a higher completion ratio compared to the students from other backgrounds. Although it may need further investigation, this finding makes sense as online instruction involves technical competencies and engineering students are in general considered technically more apt.

Table 4.1: Number of completed activities Based on departments

Faculty	Total Number of Completed Activities	Number of People	Average Number of Completed Activities
Faculty of Architecture	64	6	10.67
Faculty of Arts and Sciences	515	28	18.39

Table 4.1: Number of completed activities Based on departments (continued)

Faculty	Total Number of Completed Activities	Number of People	Average Number of Completed Activities
Faculty of Economic and Administrative Sciences	561	29	19.34
Faculty of Education	518	25	20.72
Faculty of Engineering	2286	94	24.32

Table 4.2: Number of completed activities Based on Institutes

Institute	Total Number of Completed Activities	Number of People	Average Number of Completed Activities
Social Sciences	1041	50	20.82
Engineering	2521	118	21.36
Informatics	84	2	42.00
Marine Sciences	27	1	27.00

4.3. Limitations

There are some limitations which might have affected the results of the study. First of all, due to the time limitations of the training program, some participants took the knowledge/skill post-tests before they completed the training program. This may have affected the results of the study. The skill and knowledge gains could have been higher for the participants who really completed the program. It also seems that mainly participants with certain characteristics have completed the program. For example, the mean mastery goal orientation (MGO) score of the students whose information was used to test the relationship between

MGO and practice level was 4.12 (SD = .61) over 5. Similarly, learning-self efficacy (LSE) levels of the students were also high (M = 4.07, SD = .68). Therefore, the results might well be affected by these scores, i.e., the results can be specific to students whose characteristics resemble the characteristics of the students who could complete the program. Along the same lines, if more students could have completed the program, all analyses would have been carried out with more cases, possibly with a wider variance. This would probably enhance the power of the analyses, and thus would allow for stronger conclusions. As a result, the time limit, which resulted in fewer students completing the program, could have contributed to biased results. The failure to find support for some of the hypotheses might be related to this potential bias. Since most of the information belonged to the students with relatively high MGO and LSE scores, it was probably not possible to show the difference between high and low MGO or high and low LSE participants on the outcome variables, and as a result, the hypotheses could not be supported. On the other hand, the fact that majority of the participants who completed the program has common characteristics is in line with some expectations of the study. It was expected that there would be dropouts and one aim of the study was to determine which characteristics would lead to less dropouts. The mentioned results could be interpreted as a supporting argument for certain characteristics of students as predictors of keeping up with online instruction.

Another shortcoming of the study is the fact that completion rate and knowledge/skill gains were examined simultaneously on the same sample. If completion rate were not one of the outcome variables, some incentives could have been used to increase the completion rate so that the effects of the training on the knowledge and skills could have been investigated more accurately with a greater number of students completing the training. However, in that case, the effects of individual difference factors on completion rate could not have been investigated. As a result, the investigation of these two variables simultaneously on the same sample led to less information to support hypotheses related to knowledge/skill change.

One important limitation of the study was the fact that there was no real control group for the analyses. Due to the low completion rate of the modules, the

waiting list control and experimental groups had to be combined to achieve needed number of participants for the analyses. However, this led to sacrificing the comparative analyses that would have been carried out to compare the experimental and control groups in order to safely attribute the observed differences to the online training program. If there was enough number of participants in the experimental group who completed modules at the end of the pre-designated time, then it would have been possible to compare the two groups in terms of their pre- and post-test scores to determine any significant changes happening due to the training program. Since there were not enough participants to carry out these analyses, the change scores for participants in both groups were used to determine whether there was a significant difference between the pre- and post-test scores. Although these scores gave an idea about the effect of the program, it would be more accurate to relate the positive effects to the program if there was a real control group. In that case, it could be possible to attribute the changes to the training program because it would be obvious that the change occurred only for the participants who took the program.

Finally, it is possible that the design of the training materials may have contributed to the relatively high drop-out rate observed in the training program. . Although highest care was taken to make the program as motivating as possible, it is still possible that it was not attractive and motivating enough for some of the participants.

4.4. *Recommendations for Further Studies*

As it was argued above interaction of mastery goal orientation (MGO) with other individual difference factors may have an effect on both practice level and knowledge/skill change. Therefore, future studies may examine the combined effects of MGO with several other individual difference factors including learning self-efficacy and conscientiousness on the outcome variables. A study examining these combined effects could reveal predictive relationships between these factors and the mentioned outcome variables.

Another improvement over this study could be separately examining the completion rate and the effectiveness of the training. To improve the results for effectiveness of the training, incentives for students to complete the program could

be provided. This could probably increase the proportion of the students who complete the program, thus yielding more data.

Additionally, future studies need to include a control condition to be able to effectively evaluate online instruction and attribute the observed effects to the tested instructional programs

4.5. Practical Implications and Recommendations for Online Instructional Programs

The results of this study can be used as a general guide for online instruction programs. First, although further verification of this claim is needed, the results seem to indicate that online instruction programs are generally preferred by people who are high on mastery goal orientation and learning self-efficacy. Therefore, developing the instructional program for audiences with these characteristics could benefit them more and thus make the training program more effective. For example, providing more information and supportive material for mastering the topic and including challenging learning tasks could be feasible, since these kinds of materials would both appeal to highly mastery oriented people and at the same time would not cause a retreat from the program as high learning self-efficacy would provide the necessary confidence to continue.

In addition to mastery goal orientation and learning self-efficacy, this study also showed that individuals high on conscientiousness have a higher tendency to complete the program. Therefore, by selecting participants who are relatively high on this variable, the completion rates and the effectiveness of the training could be increased. Based on the findings of current study, it can be deduced that choosing individuals high on the mentioned three personality characteristics (mastery goal orientation, learning self efficacy and conscientiousness) will probably lead to a higher completion rate.

Finally, the finding that the training program was successful in improving knowledge and skills related to complex mental tasks shows that online instruction can be used to train people on such tasks. More specifically, online instruction can be used to provide training for mental skills. This is an important implication, because it shows that online instruction can be used to alter mental schemata, and go beyond basic repetitive learning tasks.

4.6. Contributions to Literature

Online instruction is an area which has been receiving considerable interest. It is being adopted by many governmental and private institutions for accomplishing training tasks. However, the work is usually not guided by scientific principles or findings. Therefore, providing a basis for such practical work is important. This study, among many others (e.g., Buckley, 2003; Butler, 2004; Carter, 2004; Doo, 2004; Fitzgerald, 2003; Harbeck, 2001; Johnson, 2003; Juarez, 2003; Singh, 2002; Woods 2004), is an effort to provide such a scientific basis. Therefore, one of the major contributions of the present study is believed to be the recommendations made for future research. Also, it is believed that future efforts in the same direction could benefit from the findings of this study

An additional benefit of this study in online instructional area is that it represents an application on a Turkish sample. Therefore, it provides information that can be used to find internationally valid principles or principles that are valid only locally for the development of online instruction programs.

Another contribution to the literature is that this study examined the individual difference characteristics of the participants instead of technical aspects of the training. This provides insights for two questions: First, who will benefit from online instruction, and, second, which characteristics of people should be considered while developing online instruction. These insights can provide further research a basis to build on for examining other individual difference characteristics or for investigating the combined effects of individual characteristics with technical aspects.

This study also provided supportive results for predictions or expectations from past research. First, the results showed that mastery goal orientation (MGO) does not predict the practice level by itself. In accordance with Brown's findings, there is no direct relation between MGO and the undertaken practice level. Brown's suggestion about the interactive effect of MGO and learning-self efficacy on practice level seems reasonable to expect.

Similarly, as it was expected based on past research (Heinström, 2000; Harbeck, 2001), conscientiousness level of the individual predicts completion rate.

Current study supports the proposition that individuals high on conscientiousness will be more likely to continue and finish online instruction.

There are also several findings which conflict with or at least do not support past research. First, contrary to Zimmerman et. al.'s (1996) proposition, completing the training program did not increase the learning self-efficacy level of the participants. Second, past research showed that mastery goal orientation created better results in terms of declarative knowledge (Hertenstein, 2004), and in general it was related to increased learning (Ford et. al., 1998; Cobb, 2003; Dupeyrat and Mariné, 2004). However, the findings of current study do not indicate a relationship between the mastery goal orientation level and the improvement in knowledge and skills. Therefore, past findings are not supported by the current study. As discussed earlier, this might be due to the range restriction in the individual difference factor scores. However, it might be also necessary to investigate any potential interaction effects, which might have led to different findings from the past studies.

Finally, contrary to what was expected before this study, conscientiousness levels of individuals did not predict the undertaken practice level. Although it was reasonable to expect that conscientiousness level would predict practice level, the findings suggest that the relationship may not be straightforward. As stated earlier, there might be interactions between several individual characteristics and these interactions may be affecting the practice level.

4.7. Conclusion

This study, despite all of its shortcomings, has provided insights concerning the effectiveness of online instruction arena. It has also contributed to the development of scientific literature on online instruction by examining a tailor-made online instruction program applied to a large sample of university students. Even though a great majority of the students did not complete the program, they provided important insights about the characteristics of participants for such training programs. Combining all of its findings, this study is believed to provide some guidelines for further research as well as for practical applications of the knowledge in the area.

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APPENDICES

Appendix A: Departmental Distributions of Students

Table A.1: Departmental Distributions of Students

Dept. Code	Department	Number of Students
120	Architecture	7
121	City and Regional Planning	4
125	Industrial Design	2
219	Molecular Biology & Genetics	10
230	Physics	8
232	Sociology	7
233	Psychology	7
234	Chemistry	11
236	Mathematics	22
238	Biology	12
240	History	2
241	Philosophy	6
246	Statistics	8
310	Political Science & Public Adm.	21
311	Economics	22
312	Business Administration	23
314	International Relations	12
315	Global and International Affairs	1
356	Electrical-Electronics Engineering	43
359	English Preparatory School	1
411	Early Childhood Education	7
412	Elementary Science Education	4
413	Elementary Mathematics Educ.	3
420	Secondary Science & Math. Education	9
421	Physics Education	5
422	Chemistry Education	2
430	Computer Educ. And Inst. Tech.	18
445	Science Education	3
450	English Language Teaching	3
453	Physical Education & Sports	1
454	Educational Sciences	5
458	Mathematics Education	1
560	Environmental Engineering	11
561	Engineering Sciences	3
562	Civil Engineering	20
563	Chemical Engineering	30
564	Geological Engineering	8
565	Mining Engineering	13
566	Petroleum & Nat. Gas Engineering	12
568	Industrial Engineering	21

Table A.1: Departmental Distributions of Students (continued)

Dept. Code	Department	Number of Students
569	Mechanical Engineering	33
570	Metallurgical & Materials Eng.	15
571	Computer Engineering	22
572	Aerospace Engineering	8
573	Food Engineering	22
601	Basic English	2
801	History of Architecture	2
811	Urban P.P. & Local Gov.	3
820	English Lang. Teaching	3
830	Indus. & Org. Psy.	1
831	Science & Technology Policy S	1
832	Middle East Studies	2
833	European Studies	2
834	Human Resource Dev. In Educ.	1
835	Eurasian Studies	1
856	Restoration	3
861	Biotechnology	8
862	Polymer Sci. & Tech.	1
863	Archeometry	1
865	Geodetic & Geographic Inf. Tec	2
866	Engineering Management	2
901	Information Systems	2
904	Informatics Online	1
906	Medical Informatics	1
951	Phys. Oceanography	1
45440	Teaching Certificate	10
45441	Teaching Certificate	2
45443	Teaching Certificate	8
TOTAL		568

Appendix B: Years in the Program

Table B.1: Years in the Program

Years in the Program	Number of Students
1	205
2	118
3	115
4	105
5	20
6	4
8	1
TOTAL	568

The table shows the number of years the student has spent in his/her current degree program at the current degree level (e.g., masters' degree).

Appendix C: Learning Self-efficacy Scale (First Version)

Öğrenme Ölçeği

Aşağıdaki maddelerde, öğrenmeyle ilgili görüş ve düşüncelere yer verilmektedir. Her bir maddede ifade edilen görüş ve düşüncelerin sizin için ne kadar geçerli olduğunu sunulan 100 basamaklı ölçeği kullanarak belirtiniz. Maddelerden bazılarında geçen **zihinsel beceriler** ifadesi, problem çözme, hafıza kullanımı (hatırlama) gibi geliştirilebilir zihinsel becerilere karşılık gelmektedir. Katılımınız ve içten cevaplarınız için şimdiden teşekkür ederiz.

0	10	20	30	40	50	60	70	80	90	100
Kesinlikle					Orta	derecede				Kesinlikle
katılmıyorum					katılıyorum					katılıyorum

- ___ 1. Zihinsel becerilerimi geliştirmeye dönük bir eğitim programında öğretilen teknikleri öğrenebilirim.
- ___ 2. Bir eğitim programının internet üzerinden sunulması, o programda öğretilenleri öğrenmemi zorlaştırır.
- ___ 3. Eğer yeterince çalışırsam, bir eğitim programındaki en zor alıştırmaları bile yapabilirim.
- ___ 4. Günlük hayatta kullanabileceğim becerilerle ilgili bir eğitim programında öğretilenleri, kendi başıma çalışarak, uygulayacak kadar iyi öğrenebilirim.
- ___ 5. Bir eğitimin sınıfta değil de bilgisayar başında olması, o eğitimde sunulanları öğrenmemi zorlaştırır.
- ___ 6. Zihinsel becerilerimi geliştirmeye dönük bir eğitim programında öğretilenler ne kadar zor olursa olsun, yeterince çalışırsam öğrenebilirim.
- ___ 7. Aktif olarak bana eğitim verecek ve çalışmalarımı denetleyecek bir kişi olmadan da bir eğitim programında sunulanları öğrenebilirim.
- ___ 8. Yeni şeyleri kolay öğrenirim.

- ___ 9. Internet üzerinden verilen bir eğitimde de sınıfta verilen eğitim kadar iyi öğrenebilirim.
- ___ 10. Ne kadar zor olursa olsun, zihinsel becerilerimi geliştirmeye dönük bir eğitim programını tamamlayabilirim.
- ___ 11. Ne kadar çalışırsam çalışayım, bir konuyu kendi kendime öğrenemem.
- ___ 12. Zihinsel becerilerimi kendi kendime uygulayacağım bir eğitim programıyla geliştiremem.
- ___ 13. Konu ne olursa olsun, yeterince çalışırsam herhangi bir eğitimde öğretilenleri öğrenebilirim.
- ___ 14. Internet üzerinden verilen bir eğitimde, ilerlememi denetleyecek kimse olmaması daha az öğrenmeme yol açar.
- ___ 15. Zihinsel becerilerimi bilgisayar başında verilen bir eğitimle geliştirebilirim.

Appendix D: Learning Self-efficacy Scale (Final Version)

Öğrenme Ölçeği

Buradaki maddelerde, öğrenmeyle ilgili görüş ve düşüncelere yer verilmektedir. Her bir maddede ifade edilen görüş ve düşüncelerin sizin için ne kadar geçerli olduğunu sunulan 5 basamaklı ölçeği kullanarak belirtiniz. Maddelerden bazılarında geçen zihinsel beceriler ifadesi, problem çözme, hafıza kullanımı (hatırlama) gibi geliştirilebilir zihinsel becerilere karşılık gelmektedir. Bu anket toplam 15 maddeden oluşmaktadır.

	Kesinlikle Katılmıyorum		Orta Derecede Katılıyorum		Kesinlikle Katılıyorum
	1	2	3	4	5
1) Zihinsel becerilerimi geliştirmeye dönük bir eğitim programında öğretilen teknikleri öğrenebilirim.					
2) Bir eğitim programının internet üzerinden sunulması, o programda öğretilenleri öğrenmemi zorlaştırır.					
3) Eğer yeterince çalışırsam, bir eğitim programındaki en zor alıştırmaları bile yapabilirim.					
4) Günlük hayatta kullanabileceğim becerilerle ilgili bir eğitim programında öğretilenleri, kendi başıma çalışarak, uygulayacak kadar iyi öğrenebilirim.					
5) Bir eğitimin sınıfta değil de bilgisayar başında olması, o eğitimde sunulanları öğrenmemi zorlaştırır.					

	Kesinlikle Katılmıyorum	1	2	Orta Derecede Katılıyorum	3	4	Kesinlikle Katılıyorum	5
6) Zihinsel becerilerimi geliştirmeye dönük bir eğitim programında öğretilenler ne kadar zor olursa olsun, yeterince çalışırsam öğrenebilirim.								
7) Aktif olarak bana eğitim verecek ve çalışmalarımı denetleyecek bir kişi olmadan da bir eğitim programında sunulanları öğrenebilirim.								
8) Yeni şeyleri kolay öğrenirim.								
9) İnternet üzerinden verilen bir eğitimde de sınıfta verilen eğitim kadar iyi öğrenebilirim.								
10) Ne kadar zor olursa olsun, zihinsel becerilerimi geliştirmeye dönük bir eğitim programını tamamlayabilirim.								
11) Ne kadar çalışırsam çalışayım, bir konuyu kendi kendime öğrenemem.								
12) Zihinsel becerilerimi kendi kendime uygulayacağım bir eğitim programıyla geliştiremem.								
13) Konu ne olursa olsun, yeterince çalışırsam herhangi bir eğitimde öğretilenleri öğrenebilirim.								
14) İnternet üzerinden verilen bir eğitimde, ilerlememi denetleyecek kimse olmaması daha az öğrenmeme yol açar.								

	Kesinlikle Katılmıyorum		Orta Derecede Katılıyorum		Kesinlikle Katılıyorum
15) Zihinsel becerilerimi bilgisayar başında verilen bir eğitimle geliştirebilirim.	1	2	3	4	5

Appendix E: Goal-Orientation Scale (First Version)

Derslere Dönük Tercihler Ölçeği

Aşağıdaki maddelerde, dersler ve sınavlarla ilgili bazı görüşlere yer verilmektedir. Bu maddelerde belirtilen görüş ve düşüncelere ne kadar katıldığınızı, sunulan 7 basamaklı ölçeği kullanarak belirtiniz.

1	2	3	4	5	6	7
Kesinlikle			Orta derecede			Kesinlikle
katılmıyorum			katılıyorum			katılıyorum

- ___ 1. Başarısız olduğum derslere çalışmaktansa başarılı olduğum derslere çalışmayı tercih ederim.
- ___ 2. Bir derste en mutlu olduğum zaman, hata yapmayacağımı bildiğim işleri yaptığım zamandır.
- ___ 3. Yapmayı en çok sevdiğim şeyler, en iyi yaptığım şeylerdir.
- ___ 4. Başkalarının, sınavlarda ne kadar başarılı olabileceğine dair görüşleri benim için önemli **değildir**.
- ___ 5. Bir şeyi hiç hata yapmadan tamamladığımda kendimi oldukça akıllı hissedirim.
- ___ 6. Seçmeli bir dersi almadan önce o derste başarılı olabileceğimden emin olmak isterim.
- ___ 7. Geçmişte başarılı olduğum türde ödevler yapmayı severim.
- ___ 8. Bir şeyi çoğu insandan daha iyi yapabildiğim zaman kendimi akıllı hissedirim.

Appendix F: Goal-Orientation Scale (Final Version)

Derslere Dönük Tercihler Ölçeği

Buradaki maddelerde, dersler ve sınavlarla ilgili bazı görüşlere yer verilmektedir. Bu maddelerde belirtilen görüş ve düşüncelere ne kadar katıldığınızı, sunulan 5 basamaklı ölçeği kullanarak belirtiniz. Bu anket toplam 18 maddeden oluşmaktadır.

	Kesinlikle Katılmıyorum		Orta Derecede Katılıyorum		Kesinlikle Katılıyorum
	1	2	3	4	5
1) Seçmeli bir dersi almadan önce o derste başarılı olabileceğimden emin olmak isterim.					
2) Başarısız olduğum derslere çalışmaktansa başarılı olduğum derslere çalışmayı tercih ederim.					
3) Yapmayı en çok sevdiğim şeyler, en iyi yaptığım şeylerdir.					
4) Benim için, yeni beceriler kazanabilme fırsatı önemlidir.					
5) En iyi performansımı, zor görevlerle uğraşırken ortaya koyarım.					
6) Zor bir ödevi tamamlayamazsam, bir sonraki benzer ödevde daha fazla çalışırım.					
7) Geçmişte başarılı olduğum türde ödevler yapmayı severim.					
8) Bir şeyi hiç hata yapmadan tamamladığımda kendimi oldukça					

	Kesinlikle Katılmıyorum	2	Orta Derecede Katılıyorum	4	Kesinlikle Katılıyorum
akıllı hissederim.					
9) Geçmişteki performansımdan daha iyisini yapmak için çok çalışırım.					
10) Yüksek not aldığım sürece, bir derste yeni şeyleri öğrenip öğrenmemek benim için o kadar önemli değildir.					
11) Bir sorunu çözmeye çalışırken zorlanırsam, çözüme ulaşmak için değişik yaklaşımları denemekten hoşlanırım.					
12) Beni yeni şeyler öğrenmeye iten ödev ve projeler yapmayı tercih ederim.					
13) Beni zorlayan işlerle uğraşmaktan keyif alırım.					
14) Seçmeli ders tercihi yaparken, yeni şeyler öğrenebileceğim derslere öncelik veririm.					
15) Yeni bir şeyler öğrenebilme fırsatı benim için önemlidir.					
16) Bir derste en mutlu olduğum zaman, hata yapmayacağımı bildiğim işleri yaptığım zamandır.					
17) Başkalarının, sınavlarda ne kadar başarılı olabileceğime dair görüşleri benim için önemli değildir.					

	1 Kesinlikle Katılmıyorum	2	3 Orta Derecede Katılıyorum	4	5 Kesinlikle Katılıyorum
18) Bir şeyi çoğu insandan daha iyi yapabildiğim zaman kendimi akıllı hissedirim.					

Appendix G: BFI (First Version)

BFI

Aşağıda kişileri tanımlamakta kullanılabilecek bir takım sıfatlar ya da özellikler yer almaktadır. Her bir özelliğin sizi ne oranda tanımladığını, sunulan 5-basamaklı ölçeği kullanarak belirtiniz. Örneğin, başkaları ile zaman geçirmekten kesinlikle hoşlanan birisi olduğunuzu düşünüyorsanız, “*Tamamen katılıyorum*”a karşılık gelen 5 rakamını o madenin başında sunulan boşluğa yazınız.

1 = Hiç katılmıyorum

4 = Oldukça fazla katılıyorum

2 = Biraz katılmıyorum

5 = Kesinlikle katılıyorum

3 = Orta derecede katılıyorum

Kendimi biri olarak görüyorum

- | | | |
|---|---|---|
| — . 1. Konuşkan | — | 23. Tembel olma eğiliminde olan |
| — . 2. Başkalarında hata arayan | — | 24. Duygusal olarak dengeli, kolayca keyfi kaçmayan |
| — . 3. İşini tam yapan | — | 25. Keşfeden, icat eden |
| — . 4. Bunalımlı, melankolik | — | 26. Atılgan bir kişiliğe sahip |
| — . 5. Orijinal, yeni görüşler ortaya koyan | — | 27. Soğuk ve mesafeli olabilen |
| — . 6. Ketum/vakur | — | 28. Görevi tamamlanıncaya kadar sebat edebilen |
| — . 7. Yardımsever ve çıkarıcı olmayan | — | 29. Dakikası dakikasına uymayan |
| — . 8. Biraz umursamaz | — | 30. Sanata ve estetik değerlere önem veren |
| — . 9. Rahat, stresle kolay baş eden | — | 31. Bazen utangaç, çekingen olan |
| — . 10. Çok değişik konuları merak eden | — | 32. Hemen hemen herkese karşı saygılı ve nazik olan |
| — . 11. Enerji dolu | — | 33. İşleri verimli yapan |
| — . 12. Başkalarıyla sürekli didişen | — | 34. Gergin ortamlarda sakin kalabilen |
| — . 13. Güvenilir bir çalışan | — | 35. Rutin işleri yapmayı tercih eden |

_____	14. Gergin olabilen	_____	36. Sosyal, girişken
_____	15. Maharetli, derin düşünen	_____	37. Bazen başkalarına kaba davranabilen
_____	16. Heyecan yaratabilen	_____	38. Planlar yapan ve bunları takip eden
_____	17. Affedici bir yapıya sahip	_____	39. Kolayca sinirlenen
_____	18. Dağınık olma eğiliminde	_____	40. Düşünmeyi seven, fikirler geliştirebilen
_____	19. Çok endişelenen	_____	41. Sanata ilgisi çok az olan
_____	20. Hayal gücü yüksek	_____	42. Başkalarıyla işbirliği yapmayı seven
_____	21. Sessiz bir yapıda	_____	43. Kolaylıkla dikkati dağılan
_____	22. Genellikle başkalarına güvenen	_____	44. Sanat, müzik ve edebiyatta çok bilgili

Appendix H: BFI (Final Version)

BFI

Buradaki maddelerde kişileri tanımlamakta kullanılabilecek bir takım sıfatlar ya da özellikler yer almaktadır. Her bir özelliğin sizi ne oranda tanımladığını, sunulan 5 basamaklı ölçeği kullanarak belirtiniz. Bu anket toplam 44 maddeden oluşmaktadır.

	Kesinlikle Katılmıyorum	2	Orta Derecede Katılıyorum	4	Kesinlikle Katılıyorum
1. Konuşkan					
2. Başkalarında hata arayan					
3. İşini tam yapan					
4. Bunalımlı, melankolik					
5. Orijinal, yeni görüşler ortaya koyan					
6. Ketum					
7. Yardımsever ve çıkarıcı olmayan					
8. Biraz umursamaz					
9. Rahat, stresle kolay baş eden					
10. Çok değişik konuları merak eden					
11. Enerji dolu					
12. Başkalarıyla sürekli didişen					
13. Güvenilir bir çalışan					
14. Gergin olabilen					
15. Maharetli, derin düşünen					
16. Heyecan yaratabilen					
17. Affedici bir yapıya sahip					
18. Dağınık olma eğiliminde					

	Kesinlikle Katılmıyorum	2	Orta Derecede Katılıyorum	4	Kesinlikle Katılıyorum
19. Çok endişelenen					
20. Hayal gücü yüksek					
21. Sessiz bir yapıda					
22. Genellikle başkalarına güvenen					
23. Tembel olma eğiliminde olan					
24. Duygusal olarak dengeli, kolayca keyfi kaçmayan					
25. Keşfeden, icat eden					
26. Atılgan bir kişiliğe sahip					
27. Soğuk ve mesafeli olabilen					
28. Görevi tamamlanıncaya kadar sebat edebilen					
29. Dakikası dakikasına uymayan					
30. Sanata ve estetik değerlere önem veren					
31. Bazen utangaç, çekingen olan					
32. Hemen hemen herkese karşı saygılı ve nazık olan					
33. İşleri verimli yapan					
34. Gergin ortamlarda sakin kalabilen					
35. Rutin işleri yapmayı tercih eden					
36. Sosyal, girişken					
37. Bazen başkalarına kaba davranabilen					
38. Planlar yapan ve bunları takip eden					
39. Kolayca sinirlenen					
40. Düşünmeyi seven, fikirler geliştirebilen					
41. Sanata ilgisi çok az olan					
42. Başkalarıyla işbirliği yapmayı seven					
43. Kolaylıkla dikkati dağılan					

	1 Kesinlikle Katılmıyorum	2	3 Orta Derecede Katılıyorum	4	5 Kesinlikle Katılıyorum
44. Sanat, müzik ve edebiyatta çok bilgili					

Appendix I: Effective Time Management Test – 1

Zaman Yönetimiyle İlgili Bilgi Düzeyiniz

Bu testin amacı, zaman yönetimiyle ilgili olarak şu anda ne düzeyde bilgili olduğunuzu belirlemenize yardım etmektir.

Aşağıda ifadelerin doğru ya da yanlış olduklarını, yanlarındaki ilgili daireyi işaretleyerek belirtiniz.

	Doğru	Yanlış
1 Zaman kaybı telafi edilebilir.	☐	☐
2 İnsan çevresini istediği düzeyde kontrol edemez.	☐	☐
3 Yaşamın birçok alanında, gösterilen çabalarla elde edilen sonuçlar birbiriyle doğru orantılı değildir.	☐	☐
4 Büyük bir işi bir bütün olarak ele almak, bu işi bitirmeyi kolaylaştırır.	☐	☐
5 Etkili olmakla verimli olmak aynı şeydir.	☐	☐
6 Final devresi gibi yoğun zamanlarda, zaten yapılacak işler belli olduğu için planlamayla vakit kaybetmeye gerek yoktur.	☐	☐
7 Kısa vadeli ve orta vadeli hedefleri belirlerken, uzun vadeli hedeflerden yola çıkmak gerekir.	☐	☐
8 Acil olan tüm işleri, acil olmayan işlerden önce yapmak, kriz yaşanmasını önler.	☐	☐
9 Zaman yönetiminde başarılı olmak için, kendi zamanının sorumluluğunu almak gerekir.	☐	☐
10 Yapılacak işlerin listesi çıkartıldıktan sonra listedeki işleri öncelik sırasına koymak gerekir.	☐	☐

11. Etkili zaman yönetimi için aşağıdakilerden hangileri **kesinlikle** gereklidir (doğru cevapların yanındaki kutuları işaretleyiniz):

- ☐ Metodik bir yaklaşım göstermek.
- ☐ Sonuçlara 20% oranında katkıda bulunan, işlerin 80%'lik bölümünü mutlaka yapmak.
- ☐ Değerlendirme yaparken nesnel olmak.
- ☐ Yapılacaklar listenizdeki tüm işleri yapmaya zaman ayırmak.

12. Hedeflerin gerçeğe dönüştürülebilmesi için:

- ☐ belirgin
- ☐ kolay
- ☐ ölçülebilir
- ☐ eyleme dönük
- ☐ kısa vadeli
- ☐ gerçekçi
- ☐ zor
- ☐ zamana bağlı

olmaları gereklidir. (doğru olanların yanındaki kutuları işaretleyiniz.)

13. Aşağıdakilerden hangileri, zaman yönetiminde sıkça yapılan yanlış uygulamalardandır? (seçtiğiniz cevapların yanındaki kutuları işaretleyiniz)

- ☐ Yapılacak işlerin öncelik sırasını belirlememek
- ☐ Planlamaya zaman ayırmak
- ☐ Planları aşırı yüklemek
- ☐ Planları yazılı olarak yapmak
- ☐ Beklenmeyen şeylere zaman ayırmak
- ☐ İşler arasında gerekli zamanı bırakmamak

Gönder

Appendix J: Effective Time Management Test – 2

Zaman Yönetimiyle İlgili Durumunuz

Bu anketin amacı, zaman yönetimiyle ilgili olarak şu anda ne durumda olduğunuzu belirlemenize yardım etmektir.

Aşağıdaki cümlelerin sizi ne kadar ifade ettiğini, sunulan ölçeği kullanarak belirtiniz.

	Kesinlikle Katılmıyorum (1)	(2)	Orta Derecede Katılıyorum (3)	(4)	Kesinlikle Katılıyorum (5)
1 Ödevlerimi, raporlarımı ve projelerimi zamanında yetiştirmekte sıklıkla sorun yaşıyorum.	☐	☐	☐	☐	☐
2 Zamanımın nereye gittiğini anlamıyorum.	☐	☐	☐	☐	☐
3 Yaşamda ne istediğimi belirten hedeflerim var	☐	☐	☐	☐	☐
4 Bu hedeflerimi yazılı olarak ifade ettim.	☐	☐	☐	☐	☐
5 Bu hedeflerimi sık sık gözden geçiriyorum.	☐	☐	☐	☐	☐
6 Sıkıcı ya da çok zor olan işleri sık sık erteliyorum.	☐	☐	☐	☐	☐
7 Yapmayı çok isteyip de yapmaya bir türlü zaman bulamadığım en az	☐	☐	☐	☐	☐

	Kesinlikle Katılmıyorum (1)	(2)	Orta Derecede Katılıyorum (3)	(4)	Kesinlikle Katılıyorum (5)
bir şey var.					
8 Zamanımın nasıl geçeceğine ben karar veriyorum.	☐	☐	☐	☐	☐
9 Bazen, işleri gerektiğinden daha iyi yapmak için zaman kaybediyorum.	☐	☐	☐	☐	☐

Gönder

Appendix K: Sample Text and Questions

The Text:

Benim Başıma Geleceğini Hiç Düşünmemiştim

Elva'yı bekleme odamda karşıladım ve birlikte ofisime kadar olan kısa mesafeyi yürüdük. Bir şey olmuştu. Bugün farklıydı Elva, yürüyüşü zahmetli, cesareti kırık, süngüsü düşüktü. Son birkaç haftadır adımlarına bir canlılık gelmişti ama bugün yine, ilk kez sekiz ay önce karşılaştığım umutsuz, ayaklarını sürüyen kadına benziyordu. O zamanki ilk sözlerini anımsıyorum: "Galiba yardıma ihtiyacım var. Hayat yaşamaya değer görünmüyor. Kocam öleli bir yıl oldu ama henüz hiçbir şey daha iyiye gitmiyor. Belki de ben yavaş öğreniyorum."

Ama Elva hiç de yavaş öğrenen biri çıkmamıştı. Terapi fevkalade iyi ilerlemişti - belki de fazla kolay yürüyordu. Onu böyle gerileten ne olabilirdi?

Elva otururken içini çekip söze başladı, "Bunun benim başıma geleceğini hiç düşünmemiştim."

Soyulmuştu. Anlatışından, sıradan bir çanta çarptırma vakası gibi görünüyordu. Hırsız kuşkusuz onu bir Monterey sahil restoranında gözüne kestirmiş ve hepsi yaşlı dullar olan üç arkadaşı adına nakit olarak hesabı ödediğini görmüştü. Sonra park yerine kadar onu izlemiş ve ayak sesleri dalgaların kükreyişinde boğularak koşmaya başlamış, hiç duralamadan çantayı çekip almış ve yakındaki arabasına atlayıvermişti.

Elva, şişmiş bacaklarına karşın yel yepelek restorana dönüp yardım istemişti ama tabii artık çok geçti. Birkaç saat sonra polisler yol kenarında bir çalıya takılmış sallanan boş çantasını bulmuşlardı.

Üç yüz dolar Elva için önemli bir paraydı ve birkaç gün kafası hep onunla meşgul olmuştu. O kaygı giderek buharlaşmış ve ardında acı bir tortu bırakmıştı – "Bunun benim başıma geleceğini hiç düşünmemiştim" cümlesiyle ifade edilen bir tortu. Çantası ve üç yüz dolarıyla birlikte, Elva'nın bir yanılması da çarpılıp götürülmüştü - özel bir insan olduğu yanılması. Her zaman ayrıcalıklı bir çevrede, sıradan insanlara musallat olan nahoşluklardan, sevimsiz zahmetlerden uzak yaşamıştı. Sıradan insanlar, boyalı basının ve haber yayınlarının sürekli soyulan ya da sakatlanan kıvıl kıvıl kitleleriydi.

Soygun her şeyi deęiřtirmiřti. Yařamındaki rahatlık, sıcaklık, yumuřaklık çekip gitmiřti; güvenlięi kalmamıřtı. Evi her zaman minderleri, bahçeleri, yorganları ve kalın halılarıyla onu çağırırdı. řimdi ise her yerde kilitler, kapılar, hırsız alarmları ve telefonlar görüyordu. Köpeęini her sabah altıda yürüyüře çıkarırdı. Ama artık sabahın sessizlięinde bir tehdit seziyordu. Köpeęiyle birlikte durup tehlikeye kulak kabartıyorlardı.

Bunların hiçbirini kayda deęer řeyler deęildi. Elva bir travma geęirmiřti ve řimdi olaęan travma-sonrası stresini yaşıyordu. Bir kazadan ya da saldırıdan sonra çoęu insan kendini güvenlikte hissetmez, irkilme eřięi alçalır ve ařırı tetikte olur. Zamanla olayın anısı ařınır ve kurbanlar yavař yavař eski güven duygularını kazanırlar.

Ne var ki Elva için bu basit bir saldırının ötesindeydi. Dünya görüşünde bir çatlak oluřmuřtu. Sık sık, "Bir insanın gözleri, kulakları ve bir ağız olduęu sürece onun arkadařlığını kazanabilirim," derdi. Ama artık böyle deęildi. İyilięe, kiřisel yaralanmazlıęına olan inancını yitirmiřti. Kendini soyulmuř, sıradan, korunmasız hissediyordu. O soygunun gerçekte etkisi, yanılısamları paramparça etmek ve kocasının ölümünü gaddarca doęrulamak olmuřtu.

Elbette Albert'in ölmüř olduęunu biliyordu. Ölmüřtü ve bir buçuk yılı ařkın bir süredir mezarındaydı. Elva dulların geętięi yollardan usulünce geęmiřti: kanser teřhisi; o berbat, öęürtücü, oyalayıcı kemoterapi; Carmel'i birlikte son ziyaretleri; El Camino Real'den son geęiřleri; evdeki hastane yataęı; cenaze; olaęan yazıřmalar; sürekli azalan yemek davetleri; dullar kulübü; uzun, yalnız geceler. Eksiksiz bir ölüm felaketi.

Yine de, tüm bunlara karřın, Elva Albert'in varlıęının ve buna baęlı olarak kendi güvenlięinin ve özellięinin sürdüęü duygusunu korumuřtu. "Miř gibi" yařamaya devam etmiřti, dünya güvenliymiř gibi, Albert orada, arkada garajın bitiřięindeki atölyedeymiř gibi.

Dikkat edin, gafletten söz etmiyorum. Mantık düzeyinde Elva Albert'in öldüğünü biliyordu, ama alıřtıęı günlük yařamını, acıyı uyuřturan ve durumu bilenlerin dik bakıřlarını yumuřatan bir hayal perdesi ardında yaşıyordu. Kırk yılı ařkın bir süre önce yařamla, kesin kaynaęı ve kořulları zamanla ařınmıř ama temel nitelięi açık olan bir sözleřme yapmıřtı: Albert sonsuza dek Elva'ya kol kanat

gerecekti. Elva tüm farazi dünyasını bu bilinçdışı önermenin üzerine kurmuştu - iyi kalpli bir babanın kanatları altında güven dolu bir dünya.

Albert bir tamirciydi. Çatı tamircisi, otomobil tamircisi, elinden her iş gelen bir işçi, bir müteahhit; her şeyi tamir edebilirdi o. Bir gazete ya da dergide fotoğrafını görüp ilgilendiği bir mobilya veya aletin aynısını atölyesinde yapmaya girişirdi. Bense bir atölyede her zaman umutsuzca beceriksiz olmuş biri olarak büyülenmiş gibi dinliyordum. Kırk bir yıl bir tamirciyle birlikte yaşamak müthiş rahatlatıcı olmalıydı. Elva'nın neden Albert'in hala orada, arkadaki atölyede olduğu, karısına kol kanat gererek bir şeyler tamir ettiği duygusuna sarıldığını anlamak güç değildi. Bundan nasıl vazgeçebilirdi? Niçin vazgeçmeliydi? Kırk bir yıllık deneyimle pekişmiş olan o anı, Elva'nın çevresine onu gerçeklerden koruyan bir koza örmüştü - yani, çantasını çarptırana kadar.

Elva'yla sekiz ay önce ilk karşılaştığımda onda sevilecek pek az şey bulabilmiştim. Tıknaç, çekiciliği olmayan, yarı cüce, yarı cin, yarı kurbağa, ve bu yarıların her biri de huysuz olan bir kadındı. Yüzünü her şekle sokabilmesi karşısında şaşakalmıştım: göz kırıyor, suratını buruşturuyor, gözlerini ya tek tek ya da çift olarak pörtletiyordu. Alın kocaman çamaşır tahtası oluklarıyla kırıp kırıp görünüyordu. Her zaman görünür durumda olan dili hızla içeri girip çıkarken ya da ıslak, titrek, lastiğimsi dudaklarının çevresinde dolanırken, büyüklüğü çarpıcı bir biçimde değişiyordu. Onu uzun süre teskin edici ilaç kullanımı sonucunda "tardive dyskinesia" (yüz kaslarının ilaç etkisiyle anormalleşmesi) derdine uğramış hastalarla tanıştırmayı hayal ederek kendi kendime neredeyse kahkahalarla gülerek eğlendiğimi anımsıyorum. Hastalar birkaç saniye içinde fena halde içerleyecekler çünkü Elva'nın kendileriyle alay ettiğini sanacaklardı.

Ama Elva'nın asıl hoşlanmadığım tarafı öfkesiydi. Her yanından öfke akıyordu ve birlikte geçirdiğimiz ilk birkaç saat içinde, tanıdığı herkes hakkında - tabii Albert hariç - söyleyecek kötü bir şey bulmuştu. Onu artık davet etmeyen arkadaşlarından nefret ediyordu. Onu rahatlatmayan insanlardan nefret ediyordu. Onu aralarına alanlar ya da dışlayanlar onun için hep aynıydı: herkeste nefret edilecek bir şey buluyordu. Albert'in ölüme mahkum olduğunu ona söyleyen doktorlardan nefret ediyordu. Ona sahte umut verenlerden daha da çok nefret ediyordu.

O saatler benim için güç olmuştu. Gençliğimde annemin sivri dilinden sessizce nefret ederek çok fazla saat harcamıştım. Çocukken onun nefret etmediği bir insanın varlığını icat etmeye çalışarak oynadığım hayal oyunlarını anımsıyorum: Müşfik bir teyze? Ona masallar anlatan bir dede? Onu savunan, kendinden büyük bir oyun arkadaşı? Ama hiçbir zaman birini bulamazdım. Tabii babam hariç, o gerçekte annemin bir parçası, sözcüsü, ruhu, annemin yarattığı ve (Asimov'un birinci robotlar yasasına göre) yaratıcısının aleyhine dönemeyen bir robottu. Tüm dualarıma karşın bir kez olsun - bir defacık, babacığım, ne olur - anneme haddini bildirmemişti.

Elva'yla tüm yapabildiğim, sebat etmek, onu sonuna kadar dinlemek, bir yolunu bulup seansa katlanmak ve ona destek verecek bir şey - genellikle bunca öfkeyi taşıyıp durmasının onun için ne kadar güç olması gerektiğine ilişkin yavan bir söz – bulup söylemek için bütün yaratıcılığımı kullanmaktı. Zaman zaman, adeta muzipçe, aile çevresinin diğer fertlerini soruşturuyordum. Elbette saygıya hak kazanmış birileri olmalıydı. Ama hiç kimse esirgenmiyordu. Oğlu? Elva onun asansörünün "üst kata çıkmadığını" söylüyordu. O "namevcuttu": orada olduğu zaman bile "namevcuttu". Ya gelini? Elva'nın tabiriyle, "bir HAP" – Hristiyan Amerikalı Prenses idi o. Oğlu eve dönerken araba telefonundan karısını arayıp akşam yemeğini derhal istediğini söylerdi. Sorun yok. Yapabilirdi. Dokuz dakika, diye anımsatırdı Elva, HAP'ın akşam yemeğini pişirmesine - mikrodalgada cüzi miktarda bir "gourmet" TV yemeğini "kotarmasına" - yeter de artardı.

Herkesin bir lakabı vardı. Kız torunu "Uyuyan güzel"in (kocaman bir göz kırpması ve baş sallamasıyla fısıldamıştı) iki tane banyosu vardı - dikkatinizi çekerim, iki tane. Yalnızlığını hafifletmek için tutmuş olduğu kahya kadın "Looney Tunes" idi ve o kadar ahmaktı ki sigara içtiğini gizlemek için dumanı tuvaletin deliğine üflüyordu. Azametli briç partneri "Dame May Whitey" idi (ve Dame May Whitey öbürlerinin yanında, Elva'ya göre San Francisco'nun briç oynayan nüfusunu oluşturan bütün o Alzheimerli hortlakların ve tükenmiş sarhoşların yanında, kıvrak zekalı kalıyordu).

Ama her nasılsa, onun hıncına, benim ondan hoşlanmayışıma ve bana annemi anımsatışına karşın bu seansları tamamladık. Öfkeme katlanarak ona biraz daha yaklaştım, annemi Elva'dan çözüp ayırarak kontr-transferans sorunumu hallettim ve yavaş, çok yavaş bir şekilde ona ısınmaya başladım.

Sanırım dönüm noktası, bir gün "Vay canına! Amma yorulmuşum," diye söylenerek kendini koltuğa attığı zaman gerçekleşti. Kaşlarımın kalkmasına yanıt olarak, az önce yirmi yaşındaki yeğeniyle on sekiz delikte golf oynadığını söyledi. (Elva altmış yaşında, bir buçuk metre boyunda ve en az yetmiş beş kilo ağırlığındaydı.)

Sohbetin bana düşen tarafını elden bırakmadan şen bir tavırla, "Nasıl gitti?" diye sordum.

Elva öne doğru eğildi, sanki odada bulunan birini dışarıda bırakmak ister gibi elini ağzının yanında tutarak bana görülmemiş sayıda kocaman dişler gösterdi ve, "Keratanın pestilini çıkardım!" dedi.

Bu bana harikulade komik geldi ve gülmeye başladım, gözlerim yaşlarla dolana dek güldüm. Gülmem Elva'nın hoşuna gitmişti. Sonradan bana bunun Herr Doktor Profesör'ün (Demek benim lakabım da buydu!) ilk içten gelen davranışı olduğunu söyledi, ve o da benimle birlikte güldü. Bundan sonra birbirimizle mükemmel geçindik. Elva'yı - olağanüstü mizah duygusunu, zekasını, komikliğini - takdir etmeye başladım. Yoğun, olaylı bir hayat sürmüştü. Pek çok bakımdan birbirimize benziyorduk. Benim gibi o da bir kuşaktan öbürüne büyük bir sıçrama yapmıştı. Benim annem ve babam yirmi yaşlarındayken, meteliksiz Rus göçmenleri olarak Amerika'ya gelmişlerdi. Onun annesiyle babası ise yoksul İrlandalı göçmenlerdi ve Elva Güney Boston'un ucuz apartmanlarıyla San Francisco'daki Nob Hill briç turnuvaları arasındaki uçurumu aşmıştı.

Terapinin başlangıcında, Elva'yla bir saat zorlu bir çalışma demektir. Onu bekleme odasından alıp getirmeye giderken adımlarımı sürürdüm. Ama birkaç ay sonra her şey değişti. Birlikte geçireceğimiz zamanı dört gözle beklemeye başladım. Seanslarımızın hiçbirisi kahkahasız geçmiyordu. Sekreterim gülümsememden o gün Elva'yı görmüş olduğumu her zaman anlayabildiğini söylüyordu.

Birkaç ay süreyle her hafta buluştuk, terapistle hasta birbirinden tat aldığı zaman genellikle olduğu gibi, terapi iyi gidiyordu. Elva'nın dulluğundan, değişen sosyal rolünden, yalnız kalma korkusundan, bedenine hiç dokunulmayışından duyduğu hüzünden söz ediyorduk. Ama her şeyden çok öfkesinden - bunun nasıl ailesini ve arkadaşlarını ondan uzaklaştırdığından - konuşuyorduk. Yavaş yavaş kendini bıraktı; daha yumuşak ve ılımlı oldu. Looney Tunes, Uyuyan Güzel, Dame

May Whitey ve Alzheimerli briç ekibi hikayelerindeki acılık azaldı. Uzlaşmalar oldu; öfkesi geri çekildikçe ailesi ve arkadaşları yaşamında yeniden belirdiler. Öyle iyi gidiyordu ki, tam çanta çarptırma olayından önce terapiye son verme konusunu gündeme getirmeyi düşünüyordum.

Ama Elva soyulunca sanki her şeye en baştan başlıyormuş duygusuna kapıldı. Bu soygun her şeyden çok onun sıradanlığını ortaya çıkarmıştı, "Benim başıma geleceğini hiç düşünmemiştim" deyişi kişisel özelliğine olan inancını kaybedişini yansıtıyordu. Kuşkusuz kendine özgü nitelikleri ve yetenekleri, eşi benzeri olmayan geçmişi, şimdiye dek yaşamış hiçbir insanın tam tamına onun gibi olmayışı bakımından yine de özeldi. Özel oluşun akılcı yanı budur. Ama bizde (bazılarımızda diğerlerinden fazla) aynı zamanda akıldışı bir özel olma duygusu da vardır. Bu bizim belli başlı ölümü yadsıma yöntemlerimizden biridir ve aklımızın, görevi ölüm dehşetini yumuşatmak olan bölümü bizim yaralanmaz olduğumuza ilişkin inancı üretir; yaşlılık ve ölüm başkalarının yazgısı olabilir ama bizim yazgımız değildir, biz yasanın, insan yazgısının ve biyolojik yazgının ötesinde yaşarız.

Elva çanta çarptırma olayına akıldışı görünen şekillerde tepki gösterdiyse de (örneğin, evinden çıkmaya korktuğu için yeryüzünde yaşayabilecek durumda olmadığını iddia ettiyse de), aslında akıldışılığın elinden alınması nedeniyle acı çektiği açıktı. O özel olma, büyümlü bir gücün etkisinde olma, kuraldışı olma, sonsuza dek korunuyor olma duygusu - ona böylesine yararlı olan tüm bu aldanişlar ikna etme güçlerini ansızın yitirmişlerdi. Artık kendi yanılsamalarının ötesini görebiliyordu ve daha önce yanılsamaların kalkan gibi koruduğu şey şimdi önünde bütün çıplaklığı ve korkunçluğuyla uzanıyordu.

Yasının yarası şimdi tamamen açığa çıkmıştı. Onu iyice açmanın, içini temizleyip doğru dürüst iyileşmesine olanak vermenin zamanı olduğunu düşündüm.

"Bunun senin başına geleceğini hiç düşünmediğini söylerken tam ne demek istediğini biliyorum," dedim. "Tüm bu belaların - yaşlanma, yitirme, ölüm - benim başıma da geleceğini kabul etmek bana da çok güç geliyor".

Elva başını salladı, kasılan alını benim kendi hakkımda özel bir şey söylememe şaşırdığını belli ediyordu.

"Albert hayatta olsaydı bunun senin başına hiç gelmemiş olacağını hissediyorsun herhalde". Albert hayatta olsaydı o üç ihtiyar tavuğu yemeğe götürmeyeceği yolundaki küstahça yanıtını duymazlıktan geldim. "O halde bu hırsızlık onun gerçekten gitmiş olduğu gerçeğini açıkça ortaya koyuyor."

Elva'nın gözleri doldu, ama ben devam etme hakkına, yetkisine, sahip olduğumu hissettim. "Biliyorum, bunu daha önce de biliyordun. Ama senin bir parçan bilmiyordu. Şimdi onun öldüğünü gerçekten biliyorsun. Avluda değil artık. Arka taraftaki atölyede de değil. Hiçbir yerde değil. Yalnızca senin anılarında".

Elva şimdi gerçekten ağlıyordu, tıknaz gövdesi dakikalarca hıçkırıklarla sarsıldı. Daha önce bunu benim yanımda hiç yapmamıştı. Orada öylece oturmuş, "Peki şimdi ne yapacağım?" diye düşünüyordum. Bereket içgüdülerim bana bir ilham verdi. Gözüm çantasına - o çalınmış, hayli hırpalanmış çantaya - ilişti ve "Şanssızlığa sözüm yok," dedim, "ama bu kadar büyük bir şeyi taşıyıp gezmekle sen de ona davetiye çıkarmıyor musun?" Elva her zamanki kabadayılığıyla, benim tıka basa dolu ceplerime ve koltuğumun yanındaki masanın üstündeki hengameye dikkat çekmekten geri durmadı. Sonra çantasının "orta boy" olduğunu beyan etti.

"Biraz daha büyük olsaydı," diye yanıtladım, "onu sağa sola taşımak için bir yük vagonuna ihtiyaç duyacaktın". "Üstelik," dedi, dalga geçmeme kulak asmadan, "İçindeki her şeye ihtiyacım var."

"Şaka ediyor olmalısın! Bir görelim bakalım!"

Elva havaya girerek çantasını kaldırıp masamın üstüne koydu, ağzını iyice açıp içindekileri boşaltmaya başladı. İlk çıkanlar üç boş yiyecek torbasıydı.

"Acil durumlar için fazladan iki taneye mi ihtiyacın var?" diye sordum.

Elva kıs kıs gülerek çantanın karnını deşmeye devam etti. Her çıkanı birlikte inceleyip tartışıyorduk. Elva, üç paket kağıt mendilin ve on iki tane kalemin (bir de üç küçük kurşunkalem parçasının) gerçekten fuzuli olduğunu kabul etti, ama iki şişe kolonya ve üç adet saç fırçası konusunda ödün vermedi ve kocaman el feneri, kalın bloknotları ve muazzam bir deste fotoğrafına ilişkin itirazlarımı mütehakkim bir el hareketiyle saf dışı bıraktı.

Her şey için didişiyorduk. Ellilik bozuk para destesi. Üç torba şeker (elbette düşük kalorili). "Elva, bunlardan ne kadar yersen o kadar zayıflayacağına mı inanıyorsun?" diye sorduğumda kıkır kıkır güldü. Bir torba dolusu kurumuş portakal kabuğu ("Öyle ya, bunların ne zaman işe yarayacağı hiç bilinmez, Elva").

Bir demet örgü şişi ("Kendilerine bir kazak arayan altı tane şiş," diye düşündüm). Bir paket hamur mayası. Kağıt ciltli bir Stephen King romanının yarısı (Elva okuduğu bölümlerin sayfalarını koparıp atıyordu: "Saklanmaya değmezlerdi," diye açıklıyordu bunu). Ufak bir tel zımba ("Elva, çılgınlık bu!"). Üç adet güneş gözlüğü. Ve en dip köşelerde çeşitli bozuk paralar, tel raptiyeler, kısıkaçlı tırnak kesiciler, zımpara kağıdı parçaları ve kuşku uyandıracak kadar kumaş tiftiğine benzeyen bir madde.

Koca çanta nihayet her şeyini teslim edince, Elva'yla birlikte masamın üzerinde sıra sıra dizilmiş duran eşyalara hayretle bakakaldık. Çanta artık boş olduğu ve boşaltma işi sona erdiği için üzgündük. Elva bana dönüp gülümsedi ve birbirimize şefkatle baktık. Olağanüstü mahrem bir andı bu. Daha önce hiçbir hastamın yapmadığı bir şekilde bana her şeyini göstermişti. Ve ben her şeyi kabul edip daha da fazlasını istemiştim. Onu her köşeye kadar izlemiş ve yaşlı bir kadının çantasının hem bir yalnızlık hem de bir yakınlık aracı olabilmesine saygı ve hayranlık duymuştum; varoluşun ayrılmaz bir parçası olan mutlak yalnızlık ve yalnızlık gerçeğini değilse de korkusunu gideren bir yakınlık.

Dönüştürücü bir seans olmuştu bu. Yakınlık zamanımız – aşk mı desem, sevişmek mi - kurtarıcıydı. O bir saatte Elva bir terk edilmişlik konumundan bir güven konumuna ilerlemişti. Canlanmış ve kendi yakınlaşma yeteneğine bir kez daha inanmıştı.

Sanırım ömrümde verdiğim en iyi terapi saatiydi bu.

Questions

1. Metinde, Looney tunes kimin lakabıdır?
 - a. Kâhya kadın
 - b. Elva'nın kız torunu
 - c. Elva'nın gelini
 - d. Elva'nın briç partneri
2. Yazarın Elva'da esas hoşlanmadığı taraf nedir?
3. “Metindeki terapist, Elva'nın yavaş öğrenen birisi olduğunu düşünüyor.” Doğru mu yanlış mı?

4. "Dikkat edin, gafletten söz etmiyorum. (1) Mantık düzeyinde Elva Albert'in öldüğünü biliyordu, ama alıştığı günlük yaşamını, acıyı uyuşturan ve durumu bilenlerin dik bakışlarını yumuşatan bir hayal perdesi ardında yaşıyordu. (2) Kırk yılı aşkın bir süre önce yaşamla, kesin kaynağı ve koşulları zamanla aşınmış ama temel niteliği açık olan bir sözleşme yapmıştı: Albert sonsuza dek Elva'ya kol kanat gerecekti. (3) Elva tüm farazi dünyasını bu bilinçdışı önermenin üzerine kurmuştu - iyi kalpli bir babanın kanatları altında güven dolu bir dünya."

Bu paragrafın ana fikrini veren cümle hangisidir?

- a. 1
 - b. 2
 - c. 3
5. Elva'nın kız torununun lakabı nedir?
- a. Hristiyan Amerikalı Prenses
 - b. Uyuyan Güzel
 - c. Pamuk prenses
 - d. Looney tunes
6. "Ama Elva soyulunca sanki her şeye en baştan başlıyormuş duygusuna kapıldı. Bu soygun her şeyden çok onun sıradanlığını ortaya çıkarmıştı, -- Benim başıma geleceğini hiç düşünmemiştim-- deyişi kişisel özelliğine olan inancını kaybedişini ansıtıyordu. Kuşkusuz kendine özgü nitelikleri ve yetenekleri, eşi benzeri olmayan geçmişi, şimdiye dek yaşamış hiçbir insanın tam tamına onun gibi olmayışı bakımından yine de özeldi. Özel oluşun akılcı yanı budur. Ama bizde (bazılarımızda diğerlerinden fazla) aynı zamanda akıldışı bir özel olma duygusu da vardır. Bu bizim belli başlı ölümü yadsıma yöntemlerimizden biridir ve aklımızın, görevi ölüm dehşetini yumuşatmak olan bölümü bizim yaralanmaz olduğumuza ilişkin inancı üretir; yaşlılık ve ölüm başkalarının yazgısı olabilir ama bizim yazgımız değildir, biz yasanın, insan yazgısının ve biyolojik yazgının ötesinde yaşarız."

Bu paragrafta anlatılanlara göre, aşağıdaki inançlardan hangisi yanlıştır?

- a. Tüm insanların özel olduğu inancı
- b. Tüm insanların biyolojik yazgıya tabii olduğu inancı

c. Kişinin ölüm gibi kötü olaylara diğer insanlardan daha uzak olduğu inancı

7. Elva'nın kocasının ölüm sebebi nedir?

8. Yazar ve Elva arasındaki ilişkinin dönüm noktasını, Elva'nın golf oynadığı yeğeninden bahsederek "Keratanın pestilini çıkardım" demesidir.

Doğru mu yanlış mı?

9. "Üç yüz dolar Elva için önemli bir paraydı ve birkaç gün kafası hep onunla meşgul olmuştu. (1) O kaygı giderek buharlaşmış ve ardında acı bir tortu bırakmıştı - --Bunun benim başıma geleceğini hiç düşünmemiştim-- cümlesiyle ifade edilen bir tortu. (2) Çantası ve üç yüz dolarıyla birlikte, Elva'nın bir yanılması da çarpılıp götürülmüştü - özel bir insan olduğu yanılması. (3) Her zaman ayrıcalıklı bir çevrede, sıradan insanlara musallat olan nahoşluklardan, sevimsiz zahmetlerden uzak yaşamıştı. (4) Sıradan insanlar, boyalı basının ve haber yayınlarının sürekli soyulan ya da sakatlanan kıvıl kıvıl kitleleriydi."

Bu paragrafın ana fikrini belirten cümle hangisidir?

- a. 1
- b. 2
- c. 3
- d. 4

10. Hangisi bu soygun Elva için basit bir saldırıdan öte olmasının nedenlerinden değildir?

- a. Elva bu soygun yüzünden iyiliğe ve kişisel yaranmazlığa olan inancını yitirmişti
- b. Elva bu soygun yüzünden kendini sıradan ve korunmasız hissediyordu
- c. Soygundan sonra Elva'nın yaşamındaki rahatlık ve sıcaklık çekip gitmişti
- d. Elva'nın çalınan paraya çok ihtiyacı vardı

Appendix L: Sample Free Recall Test

Aşağıda, rast gele seçilmiş sözcüklerden oluşan bir liste sunulmaktadır. Bu listeyi dikkatle inceleyip, aklınızda tutmaya çalışınız.

Kıstak	Alkalimetre
Baterist	Bronz
Terminal	Jaluzi
Stajyer	Kağı
Kardiyoskop	Çorap
Lehim	Tezkere
Mangal	Sürahi
Amonyak	Hoparlör
Robot	Teleferik
Mercanköşk	Çıkrık

Aşağıdaki kutulara sözcükleri hatırladığınız sırayla yazınız. Bu testte sıralama önemli değildir. Cevaplarınız bilgisayar tarafından kontrol edileceği için, sözcükleri doğru yazmaya özen gösteriniz.

Appendix M: Sample Ordered Recall Test

Aşağıda, rast gele seçilmiş sözcüklerden oluşan bir liste sunulmaktadır. Bu listeyi dikkatle inceleyip, **verildikleri sırayla** aklınızda tutmaya çalışınız.

- | | |
|-----------------|----------------|
| 1. Bazuka | 11. Koşul |
| 2. Daha | 12. Karagöz |
| 3. Anket | 13. İştikak |
| 4. Laf | 14. Başlı |
| 5. Karasu | 15. Sığımış |
| 6. Konken | 16. Çizme |
| 7. Empresyonizm | 17. Tahturevan |
| 8. Çevrik | 18. Dönme |
| 9. Maaş | 19. Rumuz |
| 10. Resmi | 20. Form |

Aşağıdaki kutulara, sözcükleri gösterildikleri sırayla yazınız. Bu testte, sıralama ÖNEMLİDİR. Cevaplarınız bilgisayar tarafından kontrol edileceği için, sözcükleri doğru yazmaya özen gösteriniz.

- | | |
|--------------------------|--------------------------|
| 1. <input type="text"/> | 11. <input type="text"/> |
| 2. <input type="text"/> | 12. <input type="text"/> |
| 3. <input type="text"/> | 13. <input type="text"/> |
| 4. <input type="text"/> | 14. <input type="text"/> |
| 5. <input type="text"/> | 15. <input type="text"/> |
| 6. <input type="text"/> | 16. <input type="text"/> |
| 7. <input type="text"/> | 17. <input type="text"/> |
| 8. <input type="text"/> | 18. <input type="text"/> |
| 9. <input type="text"/> | 19. <input type="text"/> |
| 10. <input type="text"/> | 20. <input type="text"/> |

Appendix N: Sample Paired Recall Test

Aşağıda, rast gele seçilmiş sözcük çiftlerinden oluşan bir liste sunulmaktadır. Bu listeyi dikkatle inceleyip, aklınızda tutmaya çalışınız. Hangi sözcüğün hangi sözcükle eş olduğuna dikkat ediniz.

- | | | | | | |
|-------------|---|-------------|--------------|---|--------|
| 21. münzevi | - | it | 27. akkız | - | iribaş |
| 22. örneğin | - | nine | 28. yüz | - | otobüs |
| 23. derdest | - | küfür | 29. filtre | - | kenar |
| 24. ejderha | - | nekahet | 30. şehzade | - | keklik |
| 25. püre | - | meteoroloji | 31. sakarin | - | kutu |
| 26. azim | - | emsal | 32. çarpıntı | - | humma |

Aşağıda, her satıra, daha önce gördüğünüz sözcük çiftlerindeki sözcüklerden biri yazılmıştır. Sözcüklerin yanlarındaki kutulara, sözcük çiftindeki diğer sözcüğü yazınız. Cevaplarınız bilgisayar tarafından kontrol edileceği için, sözcükleri doğru yazmaya özen gösteriniz.

- | | | | |
|-------------|----------------------|--------------|----------------------|
| 21. münzevi | <input type="text"/> | 27. akkız | <input type="text"/> |
| 22. nine | <input type="text"/> | 28. yüz | <input type="text"/> |
| 23. derdest | <input type="text"/> | 29. filtre | <input type="text"/> |
| 24. nekahet | <input type="text"/> | 30. keklik | <input type="text"/> |
| 25. püre | <input type="text"/> | 31. kutu | <input type="text"/> |
| 26. emsal | <input type="text"/> | 32. çarpıntı | <input type="text"/> |

Appendix O: Sample Number Recall Test

Aşağıda, rast gele oluşturulmuş bir sayı mevcuttur. Bu sayıyı dikkatle inceleyerek aklınızda tutmaya çalışınız.

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Aşağıdaki kutuya, hatırlamanız için sunulmuş olan sayıyı yazınız.

Appendix P: List of Resources Examined for the Training Program

Effective Time Management

Alesandrini, K. (1992). *Survive Information Overload: the 7 Best Ways to Manage Your Workload by Seeing the Big Picture*. Homewood, Ill.: Business One Irwin.

Engstrom, T. W. (1967). *Managing your time: practical guidelines on the effective use of time / Ted W. Engstrom and R. Alex Mackenzie; foreword by Herbert J. Taylor*. Grand Rapids, Mich.: Zondervan Pub. House.

Mancini, M. (2003). *Time Management*. McGraw-Hill.

McCay, J. T. (1959). *The Management of Time*. Englewood Cliffs, N.J., Prentice-Hall.

Smith, H. W. (1998). *Hayatı ve Zamanı Yönetmenin 10 Doğal Yasası*. Sistem Yayıncılık.

Fast and Effective Reading

Canavan, P. J. & King, M. L. (1968). *Developing reading skills [by] P. Joseph Canavan [and] Mary Louise King*. Boston, Allyn and Bacon.

Miller, L. L. (1964). *Increasing Reading Efficiency*. New York, Holt, Rinehart and Winston.

Morrow, K. (1980). *Skills for Reading: with Extracts from New Scientist*. Oxford University Press.

Sparks, J. E. (1971). *Read Right; Comprehension Power [by] J. E. Sparks [and] Carl E. Johnson*. Beverly Hills, Calif., Glencoe Press.

Waldman, J. (1972). *Reading with Speed and Confidence*. New York, Random House.

Wiener, H. S. & Bazerman, C. (1991). *Reading Skills Handbook*. Boston : Houghton Mifflin.

Active Use of Memory

Learning and Memory of Knowledge and Skills : Durability and Specificity (1995). Thousand Oaks, Calif. : Sage Publications.

- Bruno, F. (1944). *The Practical Way to a Better Memory*. New York, Grosset & Dunlap.
- Buzan, T. (1971). *Speed Memory*. London, Sphere.
- Cohen, G. (1996). *Memory in the Real World* . (Second Edition ed.) East Sussex, UK : Psychology Press.
- Hayes, O. W. (1961). *Your Memory-Speedway to Success in Earning, Learning and Living; Featuring the Auto-Magic Memory Method*. New York, Exposition Press.
- Neath, I. (1998). *Human Memory : an Introduction to Research, Data, and Theory*. Pacific Grove, CA : Brooks/Cole.
- O'Brien, D. (1993). *How to Develop Perfect Memory*. Pavilion Books Limited, London.
- Tileston, D. W. (2004). *What Every Teacher Should Know About Learning, Memory, and the Brain*. Thousand Oaks, Calif. : Corwin Press.
- Wood, E. E. (1974). *Mind and Memory Training*. The Theosophical Publishing House, Ltd., 68 Great Russell Street, W.C.1.

Appendix Q: Sample Mind Map

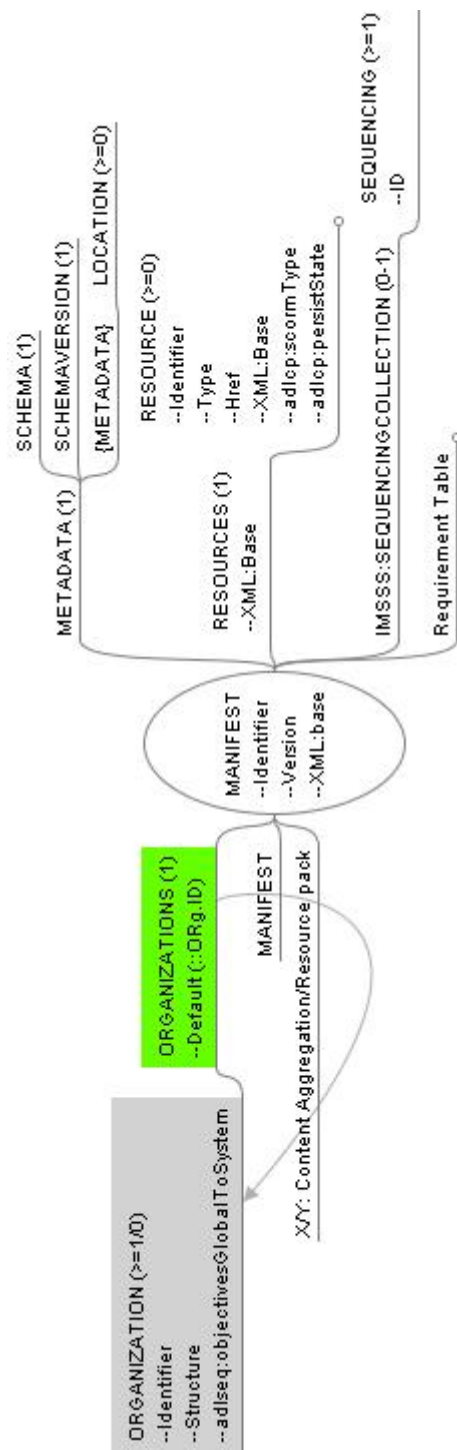


Figure Q.1: Sample Mind Map

Appendix R: Informed Consent Form

Gönüllü Katılım Şartları

Amaç: Bu çalışmanın temel amacı, internet üzerinden bir eğitim programı sunarak, temel öğrenme becerileri arasında olan etkili zaman yönetimi, hızlı ve etkili okuma, etkin bellek kullanımı becerilerinin geliştirilmesine katkıda bulunmak ve internet üzerinden sunulacak bir eğitim programının, bu becerileri geliştirmekte başarılı olup olmayacağını incelemektir.

Bilgi: Kaydolmadan önce, çalışma hakkında ayrıntılı bilgiyi, eğitimin verileceği internet sitesinde (<http://www.ogrenmeyiogrenmek.net>) bulabilirsiniz.

Gizlilik: Çalışma boyunca vereceğiniz tüm bilgiler tamamıyla gizli tutulacak ve sadece araştırma amaçlı değerlendirilecektir. Bu bilgiler kesinlikle, katılımcıların kimliğini ortaya çıkartacak şekilde kullanılmayacaktır.

Ortalamalar (GPA ve CGPA): Çalışmanın hedefi doğrultusunda, sunulan eğitimin akademik başarıya katkısını ölçmek amacıyla, katılımcıların ortalamaları, sadece çalışmada kullanılmak ve tamamıyla gizli tutulmak üzere kaydedilecektir. Bu programa kaydolmakla, ortalamalarınızı doğrudan kendiniz bildirmeyi ya da bu ortalamaların ODTÜ Öğrenci İşleri'nin ilgili birimlerinden alınmasını kabul etmiş olacaksınız.

Gönüllülük: Bu programa katılım tamamıyla gönüllülük esasına dayalıdır. Programa kaydolduğunuzda, bu çalışmaya gönüllü olarak katılmış olacaksınız.

Bırakma: Çalışma, genel olarak kişisel rahatsızlık verecek bir içeriğe sahip değildir. Ancak katılım sırasında herhangi bir nedenden ötürü rahatsızlık hissederseniz ya da devam etmek istemezseniz, programı yarıda bırakmakta serbestsiniz.

Teşekkür: Bu çalışmaya katıldığınız için şimdiden teşekkür ederiz.