

INVESTIGATING THE RELATIONSHIP BETWEEN LEARNING STYLES AND
THE EFFECTIVENESS OF ON-LINE SUPPLEMENTARY MATERIAL

A Master's Thesis

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ABSTRACT

INVESTIGATING THE RELATIONSHIP BETWEEN LEARNING STYLES AND
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This study investigated (a) the effectiveness of CALL supplementary materials on students' overall classroom achievement, (b) the relationship between students' learning styles and their classroom achievement after instruction supported by online supplementary material, and (c) differences in students' approaches to using the CALL material due to their various learning styles. The study was conducted in two different settings, Ankara University and Trakya University, School of Foreign Languages with 98 participants, who were tertiary level intermediate students. An online program was used as an instrument and the data were collected through unit tests, a learning style survey, and a CALL features questionnaire.

The analysis of the quantitative data revealed that CALL as a supplement had a positive influence on students' overall classroom achievement. In addition, although some significant correlations were seen, students' learning style preferences did not have a strong effect on their classroom achievement. Finally, some significant correlations were observed between the students' learning styles and how

they used the online supplementary material. However, the findings were not strong enough to generalize. Aside from the significant correlations, it was concluded that the features of the online program appealed to the students on both sides of the dichotomies and they appeared to benefit from the online program equally.

Key words: CALL, learning styles, effectiveness, online supplementary material.

ÖZET

ÖĞRENME STİLLERİ İLE ÇEVİRİMİÇİ DİL ÖĞRENİM DESTEK
MATERYALLERİNİN ETKİLİLİĞİ ARASINDAKİ İLİŞKİNİN İNCELENMESİ

Hakan Cangır

Yüksek Lisans, Yabancı Dil Olarak İngilizce Öğretimi Bölümü

Tez Yöneticisi: Yrd. Doç. Dr. JoDee Walters

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Bu çalışma, (a) Bilgisayar Tabanlı destek eğitim materyallerinin, öğrencilerin genel sınıf başarıları üzerindeki etkisini, (b) öğrencilerin Bilgisayar Tabanlı destek materyalleriyle yapılan eğitim sonrasındaki sınıf başarılarıyla öğrenme stilleri arasındaki ilişkiyi, ve (c) öğrencilerin, farklı öğrenme stillerine bağlı olarak Bilgisayar Destekli dil öğretim programına karşı değişen yaklaşımlarını incelemektedir. Çalışma iki ayrı üniversitede (Ankara Üniversitesi ve Trakya Üniversitesi) gerçekleştirilmiştir. Yabancı Diller Yüksek Okullarında yapılan çalışmada, 98 hazırlık sınıfı öğrencisi katılımcı olarak yer almıştır. Araştırma aracı olarak bir çevrimiçi dil öğretim programından faydalanılmıştır ve veri; ünite testleri, öğrenme stili anketi ve Bilgisayar Destekli Program özellikleri anketi ile toplanmıştır.

Sayısal veri analizi, Bilgisayar Bazlı İngilizce Öğrenme destek programının öğrencilerin genel sınıf başarıları üzerinde olumlu etkisi olduğunu ortaya koymuştur. Buna ek olarak, araştırma kapsamında bazı önemli korrelasyonlar gözlemlenmesine rağmen, öğrencilerin öğrenme stillerinin genel sınıf başarıları üzerinde etkisinin

olmadığı görülmüştür. Son olarak, öğrencilerin öğrenme stilleri ile çevrimiçi programı kullanma şekilleri arasında önemli korrelasyonlar saptanmıştır. Fakat, sonuçlar genelleyecek kadar kuvvetli değildir. Önemli korrelasyonların yanı sıra, çevrimiçi program özelliklerinin zıt öğrenme stillerine sahip öğrenci gruplarının her iki tarafına da hitap ettiği ve öğrencilerin programdan eşit ölçüde yararlandıkları sonucuna varılmıştır.

Anahtar Kelimeler: Bilgisayar Destekli Dil Öğrenimi, öğrenme stilleri, etkililik, çevrimiçi destek materyaller.

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... to my beloved family

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CHAPTER I: INTRODUCTION

Introduction

There are many language learners around the world and the way they are exposed to language differs according to their preferences, culture, status, family background, and so forth. However, it is an undeniable fact that learning English with the help of computers is a common feature shared by many students worldwide. As a result of the huge demand by English as a Foreign Language (EFL) and English as a Second language (ESL) students, in the last four decades, Computer-Assisted Language Learning (CALL) materials have gone from an emphasis on basic textual gap-filling tasks and simple programming exercises to interactive multimedia presentations with sound, animation, and full-motion video. The field of CALL has also undergone some changes due to developments in computers and the use of the internet. The focus has shifted from the need for computers in the classroom or comparisons between CALL and classroom teaching to applications in computer labs or web-based tools. CALL is now seen to be complementary to classroom activities (Beatty, 2003). Additionally, research in CALL covers an enormous range. Because the computer potentially interacts with all the key variables in language learning such as teachers, learners, methods, and materials, CALL research can involve almost any of the dimensions of instructed second language learning (Hubbard, 2003). However, since language learners have various ways for intake and comprehension of new information, their gains from a computer-assisted language class are likely to differ considerably. Learning styles, as part of this framework, have been used to describe an individual's natural, habitual, and preferred way of absorbing, processing, and retaining new information and skills (Reid, 1998). This study attempted to

investigate the relationship, if any, between learners' learning styles and their achievement in a class supported by online supplementary material. Furthermore, the effectiveness of CALL in EFL students' classroom achievement was investigated. Lastly, the study sought to explore whether there were any differences in the students' approaches to using the CALL material due to their various learning style preferences.

Background of the study

Educational technology, also called learning technology, is the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources (Richey, 2008). The World Wide Web, internet, multimedia, CD-ROM, and e-mail are some of the terminologies involved in educational technology. Although the terminology of technology is important, it is not the most crucial information that educators are expected to know. What is important, though, is an understanding of good pedagogy and the relationship among teaching, learning, and technology (Egbert & Smith, 1999). CALL is regarded as a framework for teaching and learning with technology. As access to hardware, software, telecommunication, and internet spread throughout the world, the need for an underlying pedagogical framework to support the use of these innovative technologies in the language classroom becomes even more critical (Egbert & Hanson-Smith, 1999). At the beginning of the 1980s, technology in the classroom came into use with films, television, and language labs with audio tapes. As technology developed, brand new programs were introduced in an attempt to provide the learners with a far more interactive and interesting language learning environment and as a result, computers started to gain importance in the classroom,

which eventually made technology-dominated classes common. Technology-assisted learning represents an attractive alternative or complement to face-to-face classroom learning, particularly because of its greater cost effectiveness (Hui, Hu, Clark, Tam & Milton, 2008). Furthermore, the idea of web classes was aroused and distance learning through these web-based classes integrated into traditional classes provided students with more flexibility in that these web classes met their needs more effectively than merely face-to-face methods (Winter, 2002). As Fredericksen, Picket, Pelz, Swan, and Shea (1999) also state, on-line courses are, by nature, learner-centered and can have more active participation by all students in the class than in a traditional classroom. Without the structure of weekly classes, students are generally expected to take a more active role in their own learning. A fundamental difference is that instead of simply showing up to make their presence known, in an on-line class students must do something. For example, they must submit an assignment, ask a question, or participate in a discussion.

In language teaching, CALL has long been the focus of research studies. However, since the field is growing rapidly and various new concepts are being introduced, the emphasis put on a specific aspect of CALL is changing accordingly. As Chambers and Bax (2006) state, CALL is in a developing process which will lead to a state where computers are fully integrated into pedagogy, a state of normalization. Normalization is the stage when a technology is invisible, hardly even recognized as a technology, and taken for granted in everyday life (Bax, 2003).

Previous research studies in this area mostly focused on considering the advantages and disadvantages of CALL. Brown, as one of the first researchers (1997), for instance, listed some advantages of CALL, which are accurate scoring

and immediate feedback. According to Ikeda (1999), drill-type CALL materials are appropriate for repetitive practice, enabling students to learn concepts and key elements in a subject area. In another study, Winter (2002) emphasized the importance of flexible learning, learning anywhere, anytime, anyhow, and anything you want, which is very proper for web-based instruction and CALL. Learners are given a chance to study and review the materials as many times they want without a time limit. Furthermore, according to Arias and Garcia (2000), using CALL in a classroom has many assets, such as increased motivation of the students, individualization of the learning process, immediate feedback, non-linear access to information, and the introduction of new exercise types in the classroom.

Aside from the studies conducted on advantages and disadvantages, there have also been studies investigating students' attitudes towards CALL. Finkbeiner (2001) conducted a survey with the aim of understanding students' perceptions of CALL and he suggested that the learners had positive attitudes towards CALL and that integrating it into EFL classrooms would bring success in terms of students' proficiency levels. In another study, Palmer and Holt (2008) used a questionnaire to investigate students' perceptions of studying in the wholly online mode. Five items in the questionnaire were found to significantly contribute to a model that explained approximately 70% of reported student satisfaction with studying an entirely online unit. Students' satisfaction was principally related to how confident they felt about their aptitude for communication and learning online, and also students' contentment with having a clear understanding of what was required to achieve in the unit and how well they thought they were performing in the unit. As a result of the statistical analysis, they found that learner satisfaction is correlated with quality of learning

outcomes. In another study, Özerol (2009) investigated the perceptions of EFL teachers towards CALL. She used a questionnaire and conducted some interviews in an attempt to analyze their attitudes, which revealed in the end that most of the teachers who participated in the study reported being interested or very interested in CALL.

In addition to the aspects of CALL mentioned above, there also emerged a debate regarding the effects of CALL and thus a number of studies have been conducted with the idea that knowledge of differences between computer-based classes and traditional classes has great importance in terms of both academic purposes and in-class applications. Among the studies conducted on the effects of CALL, not only positive but also some neutral conclusions have been drawn. Felix (2008) conducted a study in order to summarize the research done to explore the effectiveness of CALL. He suggested that there were enough data to indicate positive effects on spelling, reading, and listening. Kılıçkaya (2007), who conducted a study to analyze receptive skills, states that web-based classes have a significant effect on EFL students' listening and reading proficiency in TOEFL (Test of English as a Foreign Language) but not on grammar. In another study, Tanyeli (2009) claimed that the participants of her study were more successful at reading comprehension when taught through web-assisted instruction than when they were taught traditionally. It must also be noted that, regarding the influence of CALL, more studies seem to be focusing on receptive skills than productive skills.

In addition to the effectiveness of CALL on language learning, the relationship between learning styles and the effectiveness of CALL on students' classroom achievement is another key concept to be taken into consideration.

Learning styles can be defined as internally based characteristics, often not perceived or consciously used by learners, for the intake and comprehension of new information (Reid, 1998). We can talk about various learning style dimensions, but six of them are the main focus of this study. Those six learning style dimensions are visual/auditory/kinesthetic, extroverted/introverted, random-intuitive/concrete-sequential, closure-oriented/open, deductive/inductive, and field-independent/field-dependent.

The relationship between learning styles and computer-assisted learning has been investigated in several studies so far and it has been suggested that students with certain learning styles benefit more from computer-assisted learning (Clariana, 1997; Soylu & Akkoyunlu, 2009). Luk (1998) investigated the relationship between field-dependence and academic achievement in the context of online learning. Fifty-one nursing students took part in the study. The students' academic achievement scores at the end of the units in the online program were correlated with their learning style preferences. The analysis revealed that field-independent students scored significantly higher in the academic achievement tests than the field-dependent students. To be more precise, the more field-independent a student was, the better his academic achievement was.

Ross and Schulz (1999) investigated the influence of learning styles on human computer interaction. Seventy undergraduate volunteers from Calgary University took part in the study and "The Gregorc Style Delineator" and pre- and post-tests were used. The results indicated that learning styles significantly influenced learning outcomes and also there seemed to be a relationship between dominant learning styles and achievement scores. The researchers also noted that,

based on the findings, abstract-random learners may be at risk for doing poorly with particular forms of computer-aided instruction.

Although considerable research has been devoted to the effects of CALL on EFL students' reading, listening, grammar, and vocabulary skills, no attention has been paid to the improvement in students' overall classroom achievement. Another important point is that very little information exists on different learning styles and their correlation with CALL effectiveness. Furthermore, the previous studies have only looked at one or two learning style dimensions at a time. The main purpose of the experiment reported here is to analyze the relationship between learning styles and the effectiveness of computer-assisted language learning on tertiary level EFL students' classroom achievement. The present work also differs from previous studies by investigating the students' overall classroom achievement rather than focusing only on receptive skills. Finally, no studies exploring the relationship between students' learning style preferences and their different approaches to using an online program have been conducted.

Statement of the problem

Many research studies have been conducted on the attitudes and perceptions of EFL learners towards CALL (Finkbeiner, 2001; Palmer & Holt, 2008; Özerol, 2009). In addition, a great number of researchers have focused on comparing CALL with traditional classes and have found it to be advantageous in some aspects, but disadvantageous in others (Ikeda, 1999; Arias & García, 2000; Winter, 2002). Last but not least, recent research studies have focused attention on the effects of CALL on EFL students' proficiency, mostly in terms of receptive skills, such as reading and listening. However, no study has attempted to analyze the relationship between

learners' learning styles and their achievement in a class supported by CALL materials. Furthermore, no study has ever investigated students' approaches to using CALL materials in terms of their learning styles.

At the local level, my home institution, Ankara University, has undergone various changes so as to supply the best learning opportunities for its tertiary level students. For instance, the preparatory school has been moved to a new building which is equipped with numerous technological facilities such as computer labs, DVDs, and projectors in each class, wireless connection all around the building, and a web class application called "Longman English Interactive Online". However, the desired outcome does not seem to have been achieved. I have observed that few teachers seem to be taking advantage of many of these facilities. This might be because of the fact that they do not believe in the effectiveness of CALL or they think that it is not applicable in the classroom environment. Another important point to be mentioned is that they may not be aware of the extensive research that has suggested the benefits of CALL and the possible learning opportunities and flexibility it provides. Furthermore, although the program "Longman English Interactive Online" was used by the university a year ago, the decision makers claimed that it was ineffective. One possible reason for the ineffectiveness of the online program may be the students' different learning styles. In other words, in deciding that the web-class was ineffective, the students' possible different approaches to using the online program due to their various learning styles were not taken into consideration by the administrators. Thus, there is a need for an investigation of the students' approaches to using the online program in terms of their learning styles.

Research questions

This study will investigate the following research questions:

1. What are the effects of online classes as supplementary materials on tertiary level EFL students' classroom achievement?
2. What is the relationship, if any, between learners' learning styles and their performance on the classroom achievement tests supported by online supplementary material?
3. How do students with different learning styles respond to the various features of the online program?

Significance of the study

Though CALL is not a newly recognized framework for technology in language learning, studies conducted to examine its effectiveness do not appear to cover all the necessary language skills, reading, listening, speaking, and writing. This study will contribute to the literature by analyzing the effectiveness of CALL on tertiary level EFL students' overall classroom achievement. More importantly, since no research studies have been conducted on the correlation between EFL students' learning styles and the effectiveness of CALL materials on students' classroom achievement or on the way students use the CALL program, this study will also contribute to the field by showing the different outcomes and approaches, if any, for different learning styles.

At the local level, this study might provide evidence to encourage teachers to incorporate CALL into their classes. It might also raise awareness of taking students' learning styles into consideration when deciding whether or how much CALL to incorporate.

Conclusion

This chapter has covered the background of the study, statement of the problem, and significance of the study. The research questions to be addressed throughout the thesis have also been presented. The next chapters will present a detailed literature review, the methodology followed, data analysis, and conclusion, respectively.

CHAPTER II: LITERATURE REVIEW

Introduction

Computer-assisted language learning (CALL) is an approach to teaching and learning through which the materials to be learned are presented, promoted and evaluated with the help of the computer and computer-based materials, such as the Internet and software, and it is generally reinforced by interactive aspects. The field of CALL also includes the search for and the investigation of applications in language teaching and learning (Levy, 1997). CALL can also be considered as any process in which a learner uses a computer and, as a consequence, improves his or her own language. As the term itself suggests, CALL has a rapidly changing nature due to technological innovations and thus the direction of the research conducted changes.

There are also other terms which are peripheral to CALL. For instance, CALI, which originated in the USA in the 1960s and was in common use until the early 1980s, stands for “Computer-Assisted Language Instruction”. Furthermore, the term CMC symbolizes “Computer-Mediated Communication” and it refers to a situation in which computer-based discussion may take place but without necessarily involving learning. Thirdly, TELL (Technology-Enhanced Language Learning) refers to any technology used in the classroom, such as video, tape recorders or even entire listening labs (Beatty, 2003).

This study sets out to investigate the relationship between the effectiveness of CALL and learning styles. It also explores the students’ different approaches to online supplementary materials due to their various learning style preferences. In this

chapter, after detailed information regarding the historical background of CALL, some more information about the advantages/disadvantages of CALL, attitudes towards CALL, and the effectiveness of CALL will be presented. Finally, as the second major concept in the study, the literature on learning styles and the research on the relationship between computer-assisted (language) learning will be synthesized.

Historical Background of CALL

Although CALL history dates back to the 1950s, according to Warschauer, there are three stages of CALL, which are Structural CALL (1970s-1980s), Communicative CALL (1980s-1990s) and Integrative CALL (21st century). Table 1 gives a picture of Warschauer's view of CALL history.

Table 1 – Typology by Warschauer (2004)

1970s–1980s Structural CALL		1980s–1990s Communicative CALL	21 st century Integrative CALL
Technology	Mainframe	PCs (personal computers)	Multimedia and Internet
English-teaching paradigm	Grammar-translation & audio-lingual	Communicative language teaching	Content-based, ESP/EAP
View of language	Structural	Cognitive	Socio-cognitive
Principal use of computers	Drill and practice	Communicative exercises	Authentic discourse
Principal objective	Accuracy	Accuracy and fluency	Accuracy, fluency, and agency

We learn from this table that over the years, technology and English teaching methods, the reasons for using computers, and the objectives for language learning have changed. The following sections will briefly review the history. The account given here is based on Beatty (2003) and Bax (2003).

CALL in the 1950s and 1960s

The first time computers were used for language learning was in the 1950s and they were only available at research facilities on university campuses. That caused problems since students had to leave their regular classes and move to another class to get computer instruction. Additionally, the high cost of these earlier machines was regarded as a huge problem. Nevertheless, as finding means for effective language teaching was vital, time and funds were provided for research. The first CALL programs were created at three pioneering institutions: Stanford University, Dartmouth University, and the University of Essex. PLATO (Programmed Learning for Automated Teaching Operations) was among the first and most important applications for language learning with the help of computers and it was designed at the University of Illinois. Much of the language work on the program was done using a grammar translation approach. Richards and Rodgers (1994) noted that the grammar translation method dominated European and foreign language teaching from the 1840s to the 1940s. As this was the trend of the period, applying this approach to computer-assisted language learning was inevitable. However, this method appeared to work to only a limited degree because it did not appeal to all learning styles and students with various learning strategies.

CALL in the 1970s and 1980s

During the 1970s and 80s, computers were classified as mainframe, mini, and microcomputers. One focus of CALL research during this period was videodisc technology, a high-volume storage system. Unlike videotape, videodisc players enabled users to access multiple points on a disc. Thanks to the high speed and storage capacity of videodisc technology, computers were capable of providing

video-based exercises, where previously they were only capable of supplying learners with textual exercises. Bush (1997, p. 287) stated that the use of video-based exercises made practice more meaningful than traditional text-based exercises. Video provides students with a context in which they have the chance to see the real life reflections of the structure or vocabulary they learn. “Macario”, “Montevidisco”, and “Interactive Digame” are some of the early examples of videodisc programs. Some other more advanced programs such as “No Recuerdos” and “A la rencontre de Phillippe” opened to learners the door of a semi-authentic language environment. These approaches served to encourage language acquisition in that learners were made to explore and interpret the information essential for a particular given task.

CALL in the 1990s

In the 1990s, the approach of teaching with computers became communicative. The principal aim of the programs in this period was to provide students with as many communicative exercises as possible in an attempt to get students to gain not only accuracy but also fluency. As Bax (2003), who seems to object to some of the terms used by Warschauer, states, this period, which includes simulations and games, can be regarded as “Open CALL” because it is relatively open in all dimensions, such as the feedback given to students and the role of the teacher. According to him, in this period, the role of the teacher was to facilitate language learning with the help of computers. Some teachers in this period found computers frightening, while others were awed. As for CALL’s position in the syllabus, it was an optional and extra practice and it was not part of the normal lesson. Students used to go to separate labs where they spent the whole class time with computers.

Recent CALL

Nowadays, we have the potential to use computers for real communication means. However, the open dimension of technology and software doesn't seem to be matched by an open attitude in other principal areas, such as teachers' attitudes, administrators' perceptions, and the time issue. Additionally, a great amount of software being developed today, though innovative, is still of a comparatively restricted type. It can be concluded that we are in still Bax's (2003) "Open phase of CALL". However, it is also true that there are some institutions and classes which are still in the "Restricted" phase and also some which are in the "Integrated" phase. More recent researchers in CALL have preferred a learner-centered exploratory approach, where students are encouraged to work out possible solutions to a problem. To illustrate, the use of concordance programs, which is also described as data-driven learning (DDL), a term invented by Johns (1986), has become popular over the last few years. Integrated CALL and integrated language skills are concepts that will probably be taken into account more frequently in the upcoming years. Bax (2003) states that the end goal for CALL is "normalization", explaining that this concept is relevant to any kind of technological innovation and refers to the stage when technology becomes invisible, embedded in everyday practice and hence normalized (p.23).

As technology has advanced in time, the applications used in the language classroom have also evolved. As Warschauer (2004) explains in his overview of CALL history, due to the changes in language teaching aims and thanks to technological developments, the materials used in the language classroom have also changed. The following part of the literature review will provide insight into the

basic types of applications employed in computer-assisted language learning environments.

CALL Applications

Beatty (2003) states that of the many CALL applications which are widely used and can be considered as essential, four may be considered as the most common ones and also a fifth is the most relevant to the topic of the present study since it is one of the instruments to be exploited. First of all, word processing is an application which is widely used worldwide; nowadays computers are sold with a version of it already installed. It is seen as a useful tool by language learners in that it has some practical features such as spell checking and word counting. In terms of research, attention appears to have shifted from spell checking or grammar checking to computer-based composition.

Secondly, educational games are used to make the classes fun and they can be considered as implicit ways of teaching, since learners are not fully aware that they are learning something. There are a number of game programs which aim to teach language in an enjoyable way. Most course book designers also attempt to support their books with interactive CDs which include different types of games for different purposes, such as vocabulary learning and grammar reinforcement. Excitement is necessary in computer-based learning materials, particularly if they are used for young learners.

Wu (1992) states that corpora are also other current and useful devices for learning a language through computers. Not only teachers, but also students can use online corpora in the classroom so as to find common and real life usages of a word or group of words.

Warschauer (1995) states that email is one of the most popular activities on the Internet for language learners. Students can use email to communicate with peers, their teachers, and native speakers. Additionally, email can also be employed to set assignments.

Internet resources are the tools most favored by learners these days as the Internet is easily accessible from almost every house and most institutions have either a cable or wireless Internet connection. The fact that laptops are common and affordable can be given as another reason for students' interest in Internet resources. To give an example for an internet resource, which was also used as an instrument in the present study, as it is presented in the publishing company's website, *Longman English Interactive Online*, is a four-level video-based, integrated-skills web-class application including over 100 hours of instruction per level. The online class application provides presentation and practice in grammar, vocabulary, reading, writing, listening, speaking, and pronunciation (<http://www.longmanenglishinteractive.com/whatis.html>).

The change in technology has brought about more opportunities in terms of CALL materials to be used in the language classroom. The advent of new CALL applications has provided both teachers and learners with numerous tools which are likely to help learners develop their language skills. However, these new technologies have also caused some problems and some disadvantages have emerged as well as their advantages. The following section will give brief information about the experts' views on the advantages and disadvantages of CALL. Additionally, research conducted to investigate the advantages and disadvantages of CALL will be presented.

Advantages and Disadvantages of CALL

Educators (Jonassen, 1996; Rost, 2002; Salaberry, 1999) state that current computer technology has many advantages for second language learning. Computers, English Language Teaching programs, and the Internet could supply second language learners with more independence and enable them to study at any time they want without any limitations. Lee (2000) further states several reasons that we should employ computer technology in second language learning. Firstly, computers are able to supply the students with practice opportunities by means of experiential learning. Secondly, they can foster students' motivation and as a result, enhance student achievement. Thirdly, they have the capacity to provide students with authentic materials. Finally, it is also true that computers and language learning programs are able to get students to interact more and develop global understanding.

Brown (1997) stated the advantages of CALL in his study conducted to investigate the advantages of computers in language testing. According to him, CALL is advantageous in many aspects. For instance, he stated that computers are more accurate at reporting scores and much more immediate at giving feedback. Computer-adaptive testing allows testers to target the particular ability levels of individual students, thus providing more accurate estimates of language skills. Winter (2002) also laid emphasis on the flexible learning opportunities CALL provides. He stressed the advantage as "learning anytime, anywhere, and anyhow", "learning whatever you want", and "learning at your own pace in your own style" (p. 26).

In a recent study, Yağcıoğlu (2008) explored the use of web classes in language teaching. She tried to explore the advantages of websites in language

learning by asking the opinions of the scholars in the field. According to one of the professors mentioned in the study, distance learning can be advantageous especially when some factors make students unable to attend the classes, and thus using websites for improving your language skills on your own could be the best option in certain circumstances. This remark is particularly important since part of the main focus in this study is online supplementary materials, learning on your own, and online classes.

On the other hand, although there are numerous advantages of computer-assisted language learning, it also has its limitations and drawbacks. Gips, DiMattia, and Gips (2004) suggested that one of the utmost disadvantages of CALL was its high cost and the possibility of its harming equity of education. To be more precise, schools with high incomes have the means to reach new technologies, unlike schools with low incomes. In order to get the best out of computers in language learning and teaching, both students and teachers should have basic computer knowledge. Therefore, the benefits of computer technology for students who are not familiar with computers are non-existent (Robyler, 2003). What is more, the differences among students' familiarity with computers may lead to discrepancies in their performances on a computer-based test (Hicks, 1989).

In addition, the software of CALL is far from being perfect. Computers are only able to deal with three of the four basic skills in language learning - reading, listening, and writing - for the time being. Although there are some recently developed speaking programs, it is obvious that their functions are highly limited. Warschauer (2004) points out that a language learning program needs be able to understand a speaker's input and evaluate it not only for correctness but also for

appropriateness. It needs to be able to detect a student's problem with pronunciation, syntax, or usage and then help him/her fix it. However, this aim does not seem to have been achieved yet.

Although most of the studies claim that CALL is more advantageous than the traditional type of learning, some studies regarding CALL as disadvantageous can be given as examples. To give an example, Brown (1997) in the same study mentioned above also indicated some disadvantages of CALL. First of all, he states that computer equipment may not always be available or be in working condition. The message he tries to convey here is that not every country has the necessary sources of electricity in order to meet their basic needs, let alone computers. Additionally, he states that limited screen size could be another problem. In terms of performance consideration, doing a test on computer might produce different results from a test done on paper (Brown, 1997).

The advantages and disadvantages of CALL lead to various beliefs regarding its applicability in the language classroom. Whether replacing traditional instruction completely with CALL or supplementing the regular classes with it, its effectiveness on different language skills, and its cost, as well as its practicality are some of the issues that have been raised by teachers and language learners. The following section will present the research studies exploring the students' and teachers' attitudes and perceptions towards CALL.

Attitudes towards CALL

Since the time computers first appeared in the classroom, the attitudes of students and teachers towards technology use in the classroom have been of great interest for research because integrating technology into the second language

classroom presents an unfamiliar situation for the learners, in which traditional instruction loses its intensity (Beatty, 2003). Students' perceptions of this shift shape their comprehension, interaction, and performance. When we think of the current situation, it is possible to say that most students these days tend to like using computers in language learning. It can be explained by the fact that they are technology natives and they prefer learning with a practical approach, without much effort (Karpati, 2009). However, in order to get a clearer picture of what students' and teachers' attitudes towards CALL are, we need to explore some of the research conducted and the articles written on this issue.

Ayres (2002) conducted research with 157 non-native speaker undergraduate ESL participants who were enrolled in various certificate and diploma courses at the School of English and Applied Linguistics at UNITEC Institute of Technology. The researcher explored whether the students believed that an improvement in language competency had resulted from using CALL. The results of the study revealed that 80% found CALL to be relevant to their needs. Secondly, 77% said that the computer tasks supplied useful information to them and lastly, 60% had the opinion that CALL should be used more. Although they favored computer-assisted learning, they did not see it as a worthwhile replacement for classroom-based learning. Another important point to note is that though 60% of the students saw their computer skills as at a beginner level, the majority stated that they found CALL easy to use (68%) and relevant to their needs (80%). To sum up, learners saw CALL as enhancing but not a replacement for their classroom-based instruction.

Palmer and Holt (2008) did a study to examine student satisfaction with wholly online learning. Seven hundred and sixty one students were surveyed.

Respondents were asked to indicate the significance of, and their satisfaction with a range of aspects of their wholly online study. Surprisingly, the items which were rated as least important were those that might be regarded as fundamental requirements for online learning, such as being able to learn without face-to-face contact and interacting online with other students. The items with the highest satisfaction were unit-related activities supported by the online environment, such as assignment submission and access to digital resources. Participants were also asked to indicate their level of agreement with a range of statements. Items with the highest agreement were related to the students' positive functional use of the online learning environment, while items with the lowest agreement were related to the quality of assignment feedback. The researchers stated that empirical findings could suggest design and management strategies for online learning environments to maximize satisfaction and thus positive student learning outcomes.

Sagarra and Zapata (2008) investigated the attitudes of 245 learners of Spanish as a second language towards online workbooks. The participants were exposed to four hours of classroom instruction and one set of online homework per week. Students' attitudes towards the online workbook were assessed by means of a survey administered after eight months of exposure to the online material. The majority (71.7%) of the students expressed strong to moderate agreement, stating that the online homework helped them learn Spanish, and only a small number (5.6%) strongly disagreed with this statement. One-third of the learners moderately agreed that their listening (30.5%), pronunciation (34.44%) and reading skills (34.5%) in Spanish had improved after they did the online activities, and approximately two-thirds of the respondents (66.1%) agreed that completing online homework promoted

their L2 grammatical and lexical knowledge. Students were also given tests to analyze the effectiveness of the online workbook. The results of the second semester final test during which the online workbook wasn't being used were compared with the results of the third semester final test when students were exposed to the online material. The results were parallel with the positive findings of students' perceptions about the online workbook and the results were also consonant with the previous studies which underline the benefits of CALL and positive attitudes towards it. However, some negative features, such as the amount of time required to finish the activities, were revealed.

Jarvis and Szymczyk (2009) examined students' attitudes to learning grammar in autonomous contexts. In total, 38 students were surveyed and 13 of them were provided with web and paper based materials. Then, they completed a series of questionnaires related to what they favored and disliked about the two different types of materials. After that, an interview was conducted with four students to get their responses in more detail. The findings revealed that in spite of the prospective advantages of the computers and though most participants could be considered to be digital natives, they preferred working with paper-based materials. The researchers conclude that the tutorial CALL has a role but is not yet likely to replace paper-based materials.

The attitudes and perceptions of both the learners and the teachers were based on either the effectiveness or the ineffectiveness of CALL materials. Their satisfaction with online learning, its effectiveness on the students' language skills, and the relationship between the students' perceptions and the effectiveness of CALL

were the major issues previous research has focused on. The next section of the literature review will present research investigating the effectiveness of CALL.

Effectiveness of CALL

The effectiveness of computers in education has long been a concern. Educators and educational institutions have an urgent necessity to realize the extent of the impact of computers on learning so that they can decide whether to incorporate CALL into their regular classes (Dunkel, 1991). One of the major problems in examining the effectiveness of CALL in general is that research conducted up to now is rather rare in comparison with other disciplines (Dunkel, 1991; Windschitl, 1998). Although we can say that a flawless research design to explore CALL effectiveness remains unachieved, a positive inclination towards blending quantitative and qualitative methods can be observed. The majority of the studies in regard to CALL effectiveness have focused on particular language skills, such as grammar, listening, writing, or the students' vocabulary knowledge. The following research studies will present findings explaining the effectiveness of CALL in terms of certain language skills.

Nagata (1996) stated that many studies have failed to indicate the effectiveness of CALI (Computer-Assisted Language Instruction) when compared with non-CALI instruction. He attempted to compare the effectiveness of CALI with non-CALI workbook instruction. Two first-semester Japanese classes at the University of San Francisco took part in this study. The results of the study demonstrated that intelligent computer feedback is more effective than workbook answer keys for improving students' grammar competencies. A significant difference between CALI and the workbook instruction was discovered in the production tests.

A similar study focusing on the same skill was conducted by Abuseileek and Rabab'ah (2007). Their paper presents an experimental study in which they aimed to analyze the effect of "Computer-Based Grammar Instruction" on the acquisition of verb tenses in an EFL context. There were two differently taught groups. One of them was taught with computer-based grammar instruction, whereas the other was taught traditionally with a teacher's instruction. Two methods of grammar teaching were used in each group, which were the "initial rule-oriented approach" and the "structure guessing approach". The results revealed that the experimental group which was using the computer-based grammar instructional method performed better on the classroom achievement tests than the control group.

In a study showing the same skill to be positively affected by CALL, Ikeda (1999) analyzed the use of sound hints in the computer-aided grammar instruction with 21 Japanese upper and lower level participants. He stated that lower level learners used sound hints more frequently than the upper level learners when studying grammar. Furthermore, when dealing with grammar, lower level learners used sound hints before answering, whereas upper level students used hints after answering. On the whole, it can be concluded from Ikeda's article that drill-type CALL materials are more effective for repetitive practice and they strengthen grammar.

In another study focusing on students' vocabulary knowledge, Ghabanchi and Anbarestani (2008) conducted research in order to analyze the effect of a CALL program on expanding the lexical knowledge of Iranian intermediate EFL learners by comparing two groups of students. Fifty six participants who were assigned to the level as a result of a placement test took part in the study. Since the participants were

willing to prepare for the Test of English as a Foreign Language (TOEFL), a vocabulary class was planned to assist them in enhancing their lexical knowledge. The participants were selected voluntarily from among the students who had personal computers at home. The participants of both groups were studying a TOEFL practice book (Essential Words for TOEFL) in their classes. The experimental group students were required to work with a computer and some CDs, whereas the control group used a dictionary and bilingual word lists. The scores obtained from the pre-test, aiming to assess the difference in the students' vocabulary knowledge, indicated that the great majority of subjects were homogeneous. CALL users performed better in not only immediate but also delayed cloze tests and researchers came to the conclusion that CALL produced better outcomes in contextualized vocabulary learning than did the conventional dictionary approach.

In a study analyzing the same language skill, Allum (2004) did research to explore whether CALL is advantageous in initial vocabulary learning. Students were assigned three matching tasks which included some receptive and some productive vocabulary. Both receptive and productive retrieval groups gained 50% on the immediate post-test on the whole. This resulted in an average final score of about 80%, which means that the CALL work resulted in the learning of nearly 30 words in total. Additionally, as an extension to the same study to analyze whether pre-teaching vocabulary with CALL would be beneficial for the students, they were assigned to do homework designed to help them learn vocabulary before they came to class. Students having completed the homework came to class knowing roughly 85% of the total of 74 targeted words. Thus, Allum suggested that pre-teaching by CALL is very effective for targeted vocabulary learning and this is very advantageous in terms of

class time by allowing much more productive and less restricted exercises. However, the study couldn't clearly answer whether CALL used in productive retention exercises would give a specific advantage. Furthermore, Allum also revealed in his study that students tend to do more homework with CALL than they do with the printed media alone.

Ekane and Maiken (1997) conducted a quasi-experimental study focusing on the same language skill with 40 secondary school students in Cameroon. The main aim of this study was to compare the effects of teaching vocabulary with computers with the conventional method. Results revealed that, unlike the findings of Ghabanchi and Anbarestani, there was very little significant difference in the academic performance of both groups. However, the students in the experimental group showed positive attitudes towards vocabulary learning with the help of computers. The difference between the two studies may be explained by the different settings or the different features of the CALL instrument.

A later field experiment addressing both vocabulary and listening skills by Hui et al. (2008) compared the effectiveness of and satisfaction with technology-assisted learning with face-to-face learning. The participants were freshman students at a prominent university in Hong Kong. The control group participants met in the class twice as often as the experimental group but the former had no access to the course website. The researchers had a presupposition that the use of technology in language learning could improve students' vocabulary skill better than face-to-face learning but may weaken their listening comprehension. As initially predicted, the face-to-face group performed better in listening than the technology-assisted group,

but the latter revealed enhanced vocabulary skills. The findings regarding vocabulary knowledge reflect the findings of Ghabanchi and Anbarestani, and Allum.

Another study which was conducted in the same year explored the effectiveness of CALL on Turkish learners' achievement on the TOEFL. Kılıçkaya (2007) conducted a quasi-experimental study with 34 sophomore students in Middle East Technical University. The experimental group was exposed to CALL, while the other group received a traditional type of teaching. The results of the study indicated that there was no statistically significant difference between the control and the experimental group regarding the overall scores and in the structure section of the TOEFL test. However, a significant difference was observed in the reading and listening sections, which was contradictory to the results of the study conducted by Hui et al. (2008) in which they found that the technology-assisted group did worse in listening. The reason for this difference may be due to the fact that in Hui et al.'s study, the control group participants met in the classroom twice as often as did the treatment-group subjects. However, in Kılıçkaya's research, the groups spent the same amount of time in the classroom. Additionally, the setting and the features of the CALL programs may have created the difference.

In a study concentrating on another language skill, Neri, Mich, Gerosa, and Giuliani (2008) investigated whether computer-assisted pronunciation instruction could help young learners advance their word-level pronunciation skills in an ESL environment, and also compared the CALL experience with traditional teacher-led training. The 28 subjects were all 11-year-old native speakers of Italian attending the same public school. The results of the study showed that the pronunciation quality of isolated words developed considerably for both groups. Additionally, both groups

raised their level of pronunciation quality of words regarded as particularly difficult to pronounce and that were probably unknown to them before the training. Finally, the researchers also concluded that training with a computer-assisted pronunciation program could result in short term improvements in pronunciation that are comparable to those achieved by way of teacher-led pronunciation training.

In another comparative study focusing on the writing skill, Sullivan (1996) compared 38 students in two ESL writing environments, one of which was a computer-assisted classroom, and the other was a traditional oral classroom. The time spent to conduct this study was over fifteen weeks. In an attempt to avoid any effect resulting from style of teaching and materials employed, the participants were chosen from two classes taught by the same teacher. The researcher found that the writing quality of the students in the CALL class improved, whereas the mean score of the traditional class decreased significantly.

In another study, Felix (2008) conducted a meta-analysis of research into the effectiveness of CALL over the period 1981-2005. The researcher concluded that there seemed to be sufficient data in CALL to show that computers have a positive impact on spelling, reading and writing. This meta-analysis confirms the findings of Sullivan in terms of writing and also the findings of Kılıçkaya in terms of reading.

To sum up, the research so far has investigated the effectiveness of CALL in terms of students' grammar and vocabulary knowledge, listening, writing, and reading skills, pronunciation and spelling. However, no study has explored the effectiveness of CALL on students' overall classroom achievement.

The variability in the effectiveness of CALL on the different language skills has been revealed with the help of the previously conducted studies. Learning styles

might be an explanation for the variability in the effectiveness of CALL. The next part of the literature review will address the other major concept in the present study and shift from computer-assisted language learning to learning styles and the relationship between learning styles and online learning.

Learning Styles

Learning styles are regarded as various methods, individual approaches or means of learning. The term “learning styles” has been used to depict “an individual’s natural, habitual, and preferred way of absorbing, processing, and retaining new information and skills” (Reid, 1998, p.59). Moreover, Keefe (1979) defines learning styles as “the composite of characteristic cognitive, affective, and physiological factors that serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment” and Griggs (1991) explains cognitive styles as intrinsic information-processing patterns that represent a person's typical mode of perceiving, thinking, remembering, and problem solving. How learning styles relate to success in the classroom has been of interest to many researchers for quite some time. Also, the question of whether students have only one best learning style or whether they make use of a combination of those has been analyzed. As Ehrman (1996) states, very few people operate in only one style all the time. In other words, a student’s preference to learn by seeing does not mean that he cannot do it another way if circumstances require it. Guild (1994) states that a broad understanding of learning styles will enable students to take control of their learning and maximize their potential for learning.

Kang (1999) considers leaning style as being multidimensional, which means each learning style has different features and various classifications. Some learning

style dimensions have been classified into five main categories: environmental elements (sound, light, temperatures, and design), emotional elements (motivation, persistence, and responsibility), physical elements (perception, intake, time, and mobility), sociological elements (self, partner, team, mentor, varied), and psychological elements (global/analytical, impulsive/reflective) (Dunn & Dunn 1993, p.2; Keefe, 1982). As Reid also suggests in the book she edited in 1998, every person has one or more learning styles that stem from not only nature but nurture as well.

Types of learning styles

In this thesis, types of learning styles will be discussed under the headings of “cognitive” and “perceptual” dimensions. The perceptual dimension includes visual, auditory, kinesthetic, extroverted, and introverted learning styles. The cognitive dimension includes concrete-sequential, random-intuitive, closure-oriented, open, deductive, inductive, field-dependent, and field-independent learning style preferences.

As Reid (1995) describes in her perceptual learning-style preference questionnaire, visual learners learn well from seeing words in books, on the board, and on the computer. They remember and understand information and instructions if they read them. Students with this learning style do not need as much oral explanation as an auditory learner and also they can learn on their own with the help of a book. Auditory learners learn better through hearing words and with the help of oral explanations. They remember information by reading aloud or moving their lips while they read. They make the most of hearing audio tapes, lectures, and class discussions. Kinesthetic learners learn best through experience, by way of being physically engaged in classroom activities. They recall information well when they

actively take part in activities, field trips, and role-playing in the classroom. A combination of factors, such as an audiotape integrated with an activity, will help ease their understanding of the new material. Students with extroverted learning styles learn more easily when they study at least in pairs and they succeed better when they work with others. They value group interaction and class work with other students and they recall information better when they work in pairs, triads or in groups. On the other hand, students with introverted learning styles learn best when they work on their own and they remember information they learn by themselves. They make better progress in learning when they work by themselves (p. 165-166).

Ehrman (1996) defined cognitive learning styles under four dichotomies, which are random-intuitive/concrete-sequential, closure-oriented/open, deductive/inductive, and field-independent/field-dependent. A concrete-sequential learner demands to learn step by step, following a logical order usually provided with a course book or syllabus. A highly sequential learner is likely to become disappointed with very open-ended classroom activities such as free conversations and discussions. Most concrete-sequential students prefer mastering one thing before moving on to the other. Concrete-sequential learners almost never miss a point since they make sure that all the materials are covered. On the other hand, random-intuitive learners are inclined to find their own learning sequence and it may vary from time to time. In fact, most random learners are remarkably systematic, but their systems are frequently idiosyncratic, and their approach to learning appears random to the outsider. The way those people store and recall information resembles that of computers. To be more precise, data are stored in various places, and the computer can find them quickly, in whatever order they are requested. Random-intuitive

learners tend to put up with ambiguity relatively well and tolerate the surprises that are likely to disrupt the learning of others (p. 65-72).

Deductive learners prefer to begin with a rule and apply it to specific cases, whereas inductive learners prefer to begin with the data and seek the generalization that can be extracted. To illustrate, deductive learners don't like the idea of seeing a grammar structure in a text and working out the rules by themselves by looking at the given samples, whereas the inductive learners do enjoy this kind of activity (p.73).

Closure-oriented students want quick clarity while learning. They favor written information and tasks with deadlines. Sometimes their desire for closure impedes the development of fluency (Ehrman & Oxford, 1990). Unlike closure-oriented learners, open learners take L2 learning less seriously and see it like a game, having fun while learning. Additionally, open learners dislike tasks with deadlines, unlike closure-oriented students. Closure-oriented and open learners provide a balance for each other in L2 classrooms. The former are the task-driven learners, and the latter know how to have fun (Ehrman & Oxford, 1990).

The last two cognitive learning style dichotomies on which much research has been conducted are field-dependence and field-independence (Witkin, Moore, Goodenough & Cox, 1977). Also called global vs. analytical thinking, this concept is all about how learners consider and deal with information. The field-dependent learner processes information globally. This learner is less analytical, ignores details, and he/she sees the perceptual field as a whole. On the other hand, breaking the field down into its component parts is easy for a field-independent person. The existing structure generally does not influence him/her and he/she can choose what to pay attention to, independent of the perceptual field. Field-dependent people are more

socially oriented and thus respond more to reward and punishment. They also need more explicit instructions when the material they are learning is disorganized. They also are less capable of synthesizing and analyzing than field-independent learners (Frank & Davis, 1982).

CALL and Learning Styles

As CALL develops and programs proliferate, teachers are increasingly concerned with matching appropriate programs to their students' learning styles (Wild, 1996). Keobke (1998) states that in an ideal world, CALL software programs would intuitively adapt themselves to each learner and offer a number of possible interfaces and challenges to match individual learning styles. However, neither we nor computers exist in an ideal world; therefore, both teachers and students need to involve themselves in the process of adapting software to various learning styles. CALL is in a growing process and fitting CALL into individual learning styles is a demanding job. It might seem complicated to a teacher to try to adapt the programs to the learning styles of their students but it is a task too significant to be left merely to commercial software publishers.

Research on the relationship between Learning Styles and CAL

When computers were first introduced into the language classroom, they were thought to be flexible enough to appeal to multiple learning styles. This hope appeared to be too optimistic since their ability to cater multiple styles depended mainly on the software not the computer itself (Soo, 1999, p. 289). There is much research on the relationship between (CAL) Computer-Assisted Learning (CAL) and learning style dimensions. The following section presents research exploring the relationship between certain learning styles based on a variety of learning style

inventories, including “the Kolb Learning Style Inventory”, “the Gregorc Style Delineator”, “the Learning Modality Inventory”, “the Keirseley Temperament Inventory” and “the Index of Learning Styles”, and the effectiveness of computer-assisted learning. Firstly, the studies which used the “Kolb Learning Style Inventory” as an instrument will be discussed in terms of their positive, neutral, or negative findings because, although only a few of the research studies are presented here, the majority of the previous studies conducted to analyze the relationship between learning styles and CALL employed this inventory. Then, the studies employing the “Learning Modality Inventory”, “Index of Learning Styles”, “Gregorc Style Delineator”, and “Keirseley Temperament Inventory” will be addressed since those are the surveys which include some of the learning style dimensions that are the main focus of the current study.

Lu, Jia, Gong, and Clark (2007) explored the relationship between the learning styles identified on the Kolb Learning Style Inventory and online learning outcomes. One hundred and four third-year undergraduate students in the Department of Educational Technology at Shandong Normal University in China took part in the study. The subjects were divided into ten groups. Each group contained four subjects including one converger, one diverger, one assimilator, and one accommodator. Then, they were given 120 minutes to perform a designated task. Initially as a pre-test, they were expected to do the task without online aid. After the break, as a post-test they were asked to respond to the task again but this time with the help of computers and online consultation. The correlations between their learning styles and learning outcomes revealed that there was no significant association between learning styles and online learning outcomes.

Clariana (1997) conducted research with 23 fourteen year old students who received 30 minutes of CAL each day for five months. The instruments were The Kolb Learning Style Inventory and pre- and post-standardized mathematics tests. The researcher found that a general shift occurred in learning style towards “Concrete Experience” and “Active Experimentation”. The extent of the change seemed to stem from various learner abilities and different exposure times to CAL. Taking into account the shift as a result of exposure to CAL, we can conclude that learners will be more active and the inclination to guess the answers to the questions in a trial-and-error manner is likely to increase. Therefore, their risk-taking abilities will also improve.

Miller (2005) evaluated the effects of learning style on performance when using a computer-based instruction (CBI) system to teach introductory probability and statistics. Thirty female and six male students took part in the study. Two learning style questionnaires were employed to identify the students’ learning style preferences (Kolb Learning Style Inventory and Gregorc Style Delineator). After the course was over, the amount learned by each student was determined by subtracting the initial assessment score from the final assessment score. The results of the ANOVA test indicated that there was no effect of the learning style dimensions included in the Kolb learning style inventory on the amount of material learned. This finding is in parallel with the study conducted by Lu et al. (2007). However, there was a difference in amount learned according to the learning styles identified by the Gregorc Style Delineator. Concrete-sequential students learned significantly less than the students with abstract-random or concrete-random styles.

Another exploratory study by Ross and Schulz (1999) analyzed the effects of learning styles on human computer interaction. Seventy undergraduate volunteers from Calgary University took part in the study. As the instruments, “The Gregorc Style Delineator” and pre- and post-achievement tests were used. The results indicated that learning styles significantly affected learning outcomes. The researchers also noted based on the findings that if they used particular forms of computer-assisted instruction, abstract random learners would be at risk for doing poorly. It must also be noted that the relationship Ross and Schulz found in their study contradicts Miller’s finding. This difference may be explained by the different features of the online programs or the students’ different majors at university.

Neuhauser (2002) compared two sections of the same course, principles of management. One section was online, whereas the other one was face-to-face. The researcher attempted to analyze learning preferences and styles, effectiveness of tasks, course effectiveness and test grades. The researcher used the Learning Modality Preference Inventory (visual, auditory, and kinesthetic/tactile preference) and the Keirsey Temperament Inventory (introversion/extraversion). The results demonstrated that there were no significant variations in test scores or participation grades, despite the fact that the online group’s test score averages were a little higher. When asked about their attitudes, 96% of the online students regarded the course as either effective or appealing more to their learning style than a traditional face-to-face course. In addition, styles and grades in either group didn’t differ significantly. As a consequence, the study revealed that equivalent learning activities for various learning styles could be as effective for online learners as they are for face-to-face learners.

Dünser and Jirasko (2005) investigated the relevance of the distinction between sequential and global learners in the context of learning with hypertext. Traditional learning materials are normally read and studied linearly in a given sequence. Hypertext, on the other hand, can be read in many different ways and sequences. Therefore, the differentiation between global and sequential learners seems especially relevant in this context. Eighty-six Viennese university students from different departments took part in the experiment. Firstly, they gave the participants a learning style questionnaire, “Index of Learning Styles” to distinguish global from sequential learners. Then, they constructed a hypertext including thirty multiple-choice questions to measure the knowledge acquired from the text. There were 46 people (53.5%) with global learning style and 40 (46.5%) with sequential learning style. They tested their hypothesis with factorial analysis. The researchers concluded as a result of the findings that individual differences in learning and the presence or absence of structural aids in hypertexts have interactive effects on learning achievement. Students with a sequential learning style show better learning results with the hypertext form that contains structural aid than students with a global learning style.

Although there is much research on the relationship between (CAL) Computer-Assisted Learning (CAL) and learning style dimensions, not a lot of research exists on the relationship between various learning style dimensions and CALL. The following section will present some rare research focusing on the relationship between CALL and learning styles.

Research on the relationship between learning styles and CALL

Poole (2006) explored the effect of students' learning styles on their attitudes towards web-based learning. She discussed students' reactions to the course and how these might be linked to learning styles. As a survey, she used the Kolb Learning Style Inventory. Thirteen students with a BA (Hons) degree in English: Language, Literature, and Writing, took part in the study. Despite the small number of participants, the findings revealed some correlation between preferred learning styles and the modes of engagement with web-based learning. The correlations indicated that those with an active preferred learning style (i.e. activists, pragmatists or activist/pragmatists) are more likely to use the online version of the web-based course than the more passive reflectors, theorists, or reflector/ theorists, who are more likely merely to print off its printer-friendly pages and read them later.

Kim (2009) compared students' learning style preferences, obtained through "Gardner's Multiple Intelligence Inventory" survey, to their listening scores before and after CALL instruction. Thirty-nine juniors and seniors majoring in English Language and Literature at Dongduk Women's University participated in the experiment. As a result of the correlation analysis between the students' learning style preferences and their listening scores after the CALL instruction, it was revealed that there were no significant correlations between their learning style preferences and their performance in the listening test.

In another study concentrating on other learning style dimensions, Little (2001) examined the impact of field-independence and field-dependence on the use of a multimedia-assisted reading program and reading recall. Eleven university students of intermediate Spanish as a second language took part in the study. They

were given a reading text with multimedia aids on the computer. After they finished reading the text, they were asked to write everything they recalled. Then, their preferred learning styles were correlated with their recall scores. The results showed that there were no statistically significant correlations between their field-dependence/independence and their recall score.

To date, the studies that have investigated the relationship between CALL and learning styles have looked at attitudes toward and modes of engagement with CALL (Poole, 2006), reading (Little, 2001), and listening (Kim, 2009). However, the studies did not focus on the relationship between learning styles and the overall classroom achievement in a class supplemented by online learning. Additionally, previous studies analyzing the effectiveness of CALL focused on separate language skills, such as reading and listening, whereas the current study has explored the effectiveness of CALL on overall classroom achievement. In addition, it can be stated that each research used different learning style surveys and focused on different learning style dimensions. Finally, apart from the Poole's study that investigated the students' attitudes toward and modes of engagement with CALL and, there are no studies conducted analyzing the students' different approaches to using online learning, resulting from their various learning styles.

Conclusion

The review of the literature so far has provided a general picture regarding CALL and learning styles. The research studies mentioned here indicate the effectiveness of CALL, attitudes towards it, as well as learning styles and their possible relationship with CALL. The next chapter will cover the methodology

followed throughout this study, including participants, instruments, data collection and data analysis procedure.

CHAPTER III: METHODOLOGY

Introduction

The primary aim of this study was to investigate the relationship, if any, between learners' learning styles and their achievement in a class supported by online supplementary material. The study also analyzed the effectiveness of CALL supplementary materials in improving students' performance on classroom achievement tests. Last but not least, the study sought to explore if there were any differences in students' approaches to using the CALL material which resulted from their various learning styles. During this study, the researcher attempted to find answers to the following research questions:

1. What are the effects of online classes as supplementary materials on tertiary level EFL students' classroom achievement?
2. What is the relationship, if any, between learners' learning styles and their performance on the classroom achievement tests supported by online supplementary material?
3. How do students with different learning styles respond to the various features of the online program?

This chapter provides information regarding the setting, the participants, the instruments, the procedure, and data analysis.

Setting

This study was conducted at Ankara and Trakya Universities, Schools of Foreign Languages in 2010. These universities are both state universities, where the medium of instruction is 100%, 30% or less than 30% English, depending on the departments.

Ankara University

At Ankara University, School of Foreign Languages, there are two types of students. The first group of students is from departments which require them to have compulsory intensive English preparatory classes since the medium of instruction in those departments is English. The second group of students is from departments where the medium of instruction is less than 30% English. Therefore, they are not obliged to take preparatory English classes but they have the opportunity to take those preparatory English classes on their own accord. At Ankara University, the School of Foreign Languages provides students with a one year preparatory program aiming at developing the students' reading, writing, listening, and speaking skills and it also guides students to learn how to cope with English at university level.

At the beginning of every academic year, students for whom English preparatory classes are compulsory are given a proficiency test on which they have to score at least 70. Those who score less than 70 on that proficiency test are given a placement test to determine their appropriate level. Students who have the opportunity to choose whether to attend the preparatory school are given only the placement test. The School of Foreign Languages has three levels of English classes, labeled as "A", covering elementary, pre-intermediate, and intermediate, "B", covering pre-intermediate and intermediate, and "C", covering intermediate and upper-intermediate levels.

In both the first and the second semester, there are two types of classes, main course and integrated skills, taught by different teachers. In the main course, "Success" by the publishing company Longman is used together with some other teacher developed materials. Additionally, in the integrated classes, students are

taught with various books, covering reading, vocabulary, speaking, and listening skills. Classrooms are equipped with many technological tools, some of which are DVD players, projectors, and internet access. Students are assessed through various means.

Weekly class hours of the courses vary according to students' proficiency levels. Students at A level have 24 hour of class per week. Students at B level have 22 hours of class per week and finally students at C level have 20 hours of class per week.

Trakya University

At Trakya University, School of Foreign Languages, there are also two types of students. Whether or not those students take compulsory or optional intensive English classes depends on the medium of instruction in their actual departments, just like Ankara University. In terms of pedagogical aims, Trakya University has the same objectives as Ankara University.

At the beginning of every academic year, both the students whose departments require them to take English preparatory classes and the students for whom English preparatory classes are optional are given the same proficiency test, which is also used for placing the students into appropriate levels. The administration places the students in levels according to the Common European Framework (A1 – A2). The students placed at A1 level are expected to reach B1 at the end of the year and the students starting at the level of A2 are also supposed to reach B1. Since the level B1 is common in both these labels, the final exam is based on this level.

In both the first and the second semester, there are five types of classes, grammar, listening, reading, writing, and language development, taught by different

lecturers. For grammar, listening, reading and writing skills, the “Longman Success” course book is used. Further, the lecturers who are responsible for the language development classes need to create their own materials and also in their class hours, students have the opportunity to watch “Success” supplementary DVDs and have the chance to use computer facilities in the labs. The equipment in the classroom is projectors, laptops, and speakers. Students’ performance is assessed by means of tests and quizzes along with various in-class activities and assignments.

Weekly class hours of the students differ according to their level of proficiency. A1 level students have 26 hours of class, while A2 level students have 24 hours per week.

Participants

Thirty nine students from Ankara University and 59 students from Trakya University participated in the study. Out of five intermediate classes whose teachers were willing to participate, two classes from each setting were selected and randomly assigned to experimental and control conditions. There were 21 students in the experimental group and 18 students in the control group at Ankara University. At Trakya University, there were 26 in the experimental group and 33 in the control group. Those students who participated in the study were selected from a particular level, intermediate. At Ankara University, students from the intermediate level were chosen since they had started from the beginner level and the administration demanded that the results of the study be based on a group which has the most exposure to English at the School of Foreign Languages. At Trakya University, again A2 level students were selected because at the start of the research they were about to start the same level of the course book as at Ankara University.

The information about the selected classes is given below:

Table 2 – Students participating in the study

University	Level	First term level	Gender		
			Group	Male	Female
Trakya	Intermediate	Elementary	Experimental	18	8
			Control	29	4
Ankara	Intermediate	Pre-Intermediate	Experimental	7	14
			Control	11	7

Instruments & Materials

In this study, three different types of instruments were used to collect data.

Those instruments were Longman English Interactive Online (Learning Management System – Online Class), Longman Success Pre-Intermediate and Intermediate Course Book unit tests, and two questionnaires.

Longman English Interactive Online (Learning Management System)

Longman English Interactive Online is a four level web-based program and in this study, the third level of this program was used since the participants were intermediate, tertiary level students. The online program was used to supplement the course book “Success” taught in class. The students needed a key to access this online class and the access codes were provided to the students free-of-charge by the publishing company. Once the students log on to the online program, they can see the orientation page and the modules in order and also there are dictionary and grammar reference sections. In the modules, there are different materials based on the four language skills, reading, listening, speaking, and writing. Additionally, there are many grammar and vocabulary drills, presented either in an integrated way or

separately. Another feature of the online program is that the teachers can observe what the students are doing in the program, how much time they spend doing the exercises, and how well they are doing on the quizzes and the module exams.

Success Pre-Intermediate/Intermediate Course Book Unit Tests

These tests were used in this study to test the participants' classroom achievement. Since the students were about to finish the pre-intermediate level when the study started and the online program had some input in terms of pre-intermediate level, some tests from the pre-intermediate and some tests from the intermediate level booklet were employed on a weekly basis and the unit tests were correlated with the syllabuses of the universities. The tests include different type of questions, such as fill in the blanks, matching, and open-ended. Additionally, they were comprised of grammar, vocabulary, reading, listening, communication, and writing sections. Each test took one class hour. The results of these tests were used to compare the experimental and control groups' classroom achievement. A sample classroom achievement test is provided in Appendix A.

Learning Style Survey (LSS)

The LSS conducted in this study was designed by Cohen, Oxford, and Chi (2001). The survey includes statements about language learning and learning style preferences and the students responded to the questions using a Likert scale (0=never, 1=rarely, 2=sometimes, 3=often, 4=always). In this survey, there were twelve different aspects of learning styles but the researcher decided to use only six of them. The learning style dimensions selected for this survey were visual/auditory/kinesthetic, extroverted/introverted, random-intuitive/concrete-sequential, closure-oriented/open, deductive/inductive, and field-independent/field-

dependent. These dimensions were selected because previous research conducted on the relationship between computer assisted learning and students' learning styles focused on these six aspects and the researcher attempted to analyze whether the same relationship exists between computer assisted language learning and students' learning styles. Furthermore, the researcher had some presuppositions regarding the possible relationship between the online program and the learning style dimensions to be used in the study. While selecting what dimensions to include in the survey, the researcher took the features of the online program into account and selected these particular learning style aspects according to those features. Since there were many videos, listening materials and activities which require using a mouse (drag and drop), it was thought that using the online program might be affected by perceptual learning styles. Moreover, the common perception that introverted students tend to use computers a lot more frequently than extroverted students led the researcher to think about the relationship between CALL and this particular learning style dichotomy. With regard to the random-intuitive and concrete-sequential learning styles, although the program made it possible for the teachers to arrange the modules and activities according to their students' needs, for this study the online program was used as a supplement and the students controlled it themselves. It was thought that this approach was likely to appeal to the random-intuitive side of the dichotomy. As to closure-oriented and open learning style preferences, as the teacher would not set assignments or deadlines in the online program and the students would be free to use the program as they like, the program was expected to appeal to the students with an open learning style preference. In addition, due to the fact that the students had the opportunity to start with either the grammar sections or the reading and listening

sections, the online program was expected to appeal to both ends of the deductive/inductive dichotomy. Finally, it was found in previous studies that field-dependent students relied more on online learning than field-independent students. Based on these research studies, it was also thought that there could be relationship between online language learning and field-dependence/independence.

Since it was felt that the language of the survey was likely to be difficult for the participants, it was translated into Turkish. A back translation procedure was followed to obtain the most accurate version of the survey. Firstly, all the items were translated into Turkish by the researcher and then they were back translated into English by two Turkish English language teachers. Secondly, the back translated versions and the original version were compared by a native speaker of English to check if there was any difference in meaning among the versions. Then, some words or phrases that were judged to be a bit different from the original version were changed again to make sure that the two versions had the same meanings. The English and Turkish versions of the survey can be seen in Appendices B and C, respectively.

CALL features questionnaire

With the idea that the multi-featured online program could appeal to most of the learning style dimensions presented, a second questionnaire was designed. The CALL features questionnaire conducted in the study was also a learning style questionnaire, aiming to find out the differences in students' approaches to using the CALL material in terms of their various learning styles. Questions were designed by the researcher by looking at the various features of the online program and various characteristics of the six learning style dimensions. There were twenty four items in

the questionnaire related to the specific learning style dimensions and a Likert scale was used for the responses (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree). The items in this questionnaire were also in Turkish in order to prevent lack of comprehension. Prior to the main research, the questionnaire was piloted at Zonguldak University, where the students use the same online program as supplementary material for their regular course work, by a group of tertiary level students. The aim of piloting was to make sure that all the questions were comprehensible for the students. It was found that there was no problem with the wording of the items but the Cronbach alphas for the separate dimensions ranged from .34 to .71. The English and Turkish versions of the questionnaire can be seen in Appendices D and E, respectively.

Data Collection Procedures

The preliminary steps taken before the actual data collection were as follows. Firstly, the researcher asked for both universities' consent. Secondly, after the permission was granted, the publishing company Pearson Longman was asked for some support, such as supplying free program codes. Then, usernames and passwords were created for each participant in the experimental groups in both settings. As soon as the usernames and passwords were created, they were sent to the participants together with an instruction document stating how to sign into the program via e-mail. After that, the LSS was translated into Turkish following the back translation method and lastly, the CALL features questionnaire was designed by the researcher himself and piloted.

On the 15th of March, data collection started. The first week was regarded as the orientation week since the participants in the experimental groups needed some

time to get used to using the online program. At the end of the first week, the researcher met all the participants at both Ankara and Trakya University to explain to them that this study was investigating the effectiveness of CALL and its possible relationship with their learning styles and to introduce himself to them. After the briefing, the students signed the consent forms.

For the first week, the students were not given a test or a questionnaire because this week was intended to be an orientation for them to get used to the online program. The following two weeks, participants in both the experimental and control groups were given the unit tests each week. Additionally, the experimental group students were given the LSS in the second week of the study. For the other five weeks, they were given the unit tests once every two weeks since this was the pace at which they studied the units in their course books.

In the eighth week, the participants in the experimental group were given the CALL features questionnaire aiming to investigate the participants' responses to the online material in terms of their learning styles.

Data Analysis

To analyze the data gathered at the end of the research study, quantitative data analysis methods were employed. The data were statistically analyzed using the Statistical Package for the Social Sciences (SPSS) version 11.5.

To answer the first research question, the researcher entered the data collected from the unit tests into SPSS. First, unit test results of each student in the two different groups were entered and then a mean value for each student's unit test results was computed. Then, in order to find whether the difference between the two groups was significant, an independent samples *t*-test was used.

With regard to the second research question, the results of the LSS were entered into SPSS. Then, a mean response for each style dimension was computed and, according to the level of internal consistency of each dimension, as revealed by Cronbach alpha, the responses were either regarded as a set, representing a particular learning style dimension, or treated individually. Finally, the correlation coefficient was used to find any possible relationship between the survey responses and the students' classroom achievement.

As for the third research question, aiming to explore the participants' different responses to the online material in terms of their learning styles, the data gathered from the CALL features questionnaire were correlated with the students' responses to the questions in the LSS.

Conclusion

This chapter on methodology gives general information regarding the aim of the study, the research settings, participants, instruments, data collection procedures, and data analysis methods. The following chapter will present the results of the research and the data analysis method used to interpret those results in detail.

CHAPTER IV: DATA ANALYSIS

Introduction

The chief aim of this study was to explore the relationship, if any, between learners' learning styles and their achievement in a class supported by online supplementary material. The study also examined the effectiveness of the CALL supplementary materials in improving students' performance on the classroom achievement tests. Finally, the study sought to uncover the students' different approaches to using the CALL material based on their different learning style preferences.

This study addressed the following research questions:

1. What are the effects of online classes as supplementary materials on tertiary level EFL students' classroom achievement?
2. What is the relationship, if any, between learners' learning styles and their performance on the classroom achievement tests supported by online supplementary material?
3. How do students with different learning styles respond to the various features of the online program?

Data Analysis Procedure

In an attempt to address the above-mentioned first question, the unit tests in the course book "Success" were used to investigate the students' classroom achievement. The experimental groups in two different settings, who took the online supplementary material together with their regular classes, were compared with the control groups, who took only the traditional classes. The unit tests consisted of questions based on the four language skills, reading, listening, speaking, and writing.

The students' weekly test results were entered into the Statistical Packages for Social Sciences (SPSS – version 11.5) in order to compare their test score means by using a non-parametric two-independent samples test, since the data were not normally distributed.

As for the second research question, a survey consisting of 78 items and 13 different learning style dimensions was employed. The relationship between the students' classroom achievement and their learning style preferences in the two different settings was explored through correlations.

With regard to the third research question, a CALL features questionnaire was administered. The questionnaire attempted to explore the students' different approaches to the online program in terms of their learning styles. To this end, the students' responses to the LSS were correlated with their responses to the CALL features questionnaire. In order to find the correlation between the survey and the questionnaire, the data from the two different settings were collapsed and considered as one group.

Results

The data gathered through the unit tests, the LSS, and the CALL features questionnaire will be presented according to the research questions in the following section.

What are the effects of online classes as supplementary materials on tertiary level EFL students' classroom achievement?

In order to show that the experimental and control groups were at the same proficiency level before the study started, a mid-term exam at Trakya University, and a sample paper-based TOEFL test at Ankara University, both given at the end of the

first term (February the 15th, 2010) were employed. The mean scores of the pre-tests are revealed in Table 3.

Table 3 – Ankara and Trakya University pre-test means

	Participants	N	Median	Inter-quartile	Mann Whitney
	Ankara Experimental	20	246.00	49.75	<i>U</i> =152.00 <i>p</i> = .59
	Ankara Control	17	246.00	46.00	
	Trakya Experimental	26	56.00	18.25	<i>U</i> =419.00 <i>p</i> = .87
	Trakya Control	33	60.00	15.00	

As is shown in Table 3, before the study started, the Ankara University control group appeared to score higher than the experimental group in the sample TOEFL test. Additionally, the Trakya control group appeared to score higher in the mid-term exam. Since the data for the pretest means were not normally distributed, a Mann-Whitney test was used to compare the means in both settings and the differences were found to be non-significant.

As the second step, the scores students obtained from the five achievement tests were entered into SPSS, and then a mean quiz score was calculated for each student, and the means of this mean quiz score for each experimental group were compared with the mean quiz scores of the control group. The mean achievement test scores of the students at Ankara and Trakya University are shown in Table 4.

Table 4 – Ankara and Trakya University achievement test means

	Participants	N	Median	Inter-quartile	Mann Whitney
	Ankara Experimental	21	53.00	10.10	<i>U</i> =109.50 <i>p</i> =.02
	Ankara Control	18	44.50	18.55	
	Trakya Experimental	26	66.80	23.65	<i>U</i> =313.00 <i>p</i> =.07
	Trakya Control	33	56.20	18.55	

Table 4 indicates that both the Ankara and Trakya University experimental groups appeared to score higher on the classroom achievement tests than the control groups in the same universities. The difference between those mean scores was investigated in an attempt to see whether the difference was significant. Tests of normality revealed that the data collected in this study were not normally distributed. Therefore, nonparametric tests were employed to compare the means. A Mann-Whitney test showed the difference between the experimental group at Ankara University ($Mdn=53.00$) and the control group ($Mdn=44.50$) to be statistically significant, $U=109.5$, $p = .02$, $r = -.35$, with a medium effect size. In addition, the output revealed that the difference between the test scores of the Trakya experimental group ($Mdn=66.8$) and the control group ($Mdn=56.2$) was statistically significant, $U=313.0$ $p = .03$, $r = -.23$, with a small effect size. The results tell us that the experimental groups using the online program as a supplementary material together with their regular course books scored higher in the achievement tests than the control groups taught by means of their course books only, which suggests that the online material had a positive effect on those students.

What is the relationship, if any, between learners' learning styles and their performance on the classroom achievement tests supported by online supplementary material?

As the first step in the analysis of the relationship between the students' learning style preferences and their performance on the classroom achievement tests supported by online supplementary material, the students were given the LSS consisting of thirteen learning style dimensions. The reliability of the survey was

checked and the Cronbach alpha coefficients for the separate learning style dimensions were as follows:

Table 5 - Cronbach alphas for the LSS

<i>Learning Style Dimensions</i>	Trakya Exp.	Ankara Exp.
Visual	.43***	.73*
Auditory	.71*	.69*
Kinesthetic	.52***	.74*
Extroverted	.71*	.69*
Introverted	.66**	.48**
Random-Intuitive	.46***	.74*
Concrete-Sequential	.43***	.77*
Closure-Oriented	.79*	.82*
Open	.45**	.26**
Deductive	.49**	.54*
Inductive	.40***	.69*
Field-Independent	.47***	.82*
Field-Dependent	.79*	.56***
*items were considered as a set **items within the set were considered individually ***the results in this setting were not considered		

It can be seen in Table 5 that the Cronbach alpha coefficients range from .40 to .82. The cutoff point for minimum internal consistency for each learning style dimension was .69 (Field, 2005). If the Cronbach alpha in one setting was .69 or above and lower than .69 in another, then only the correlations in the setting with .69 or above Cronbach alpha were reported. Secondly, if both of the Cronbach alphas in both settings were less than .69, then the items within the set were considered individually and reported for both of the settings.

The mean scores of the students' learning style preferences are shown in Table 6.

Table 6 – Learning style dimensions average mean responses

<i>Learning Style Dimension Means</i>		Trakya Exp.		Ankara Exp.	
Mean		St. Dev.		Mean	St. Dev.
Visual		2.02	.51	2.60	.62
Auditory		1.97	.68	1.87	.58
Kinesthetic		1.96	.52	1.98	.60
Extroverted		1.98	.93	2.61	.84
Introverted	I prefer individual or one-on-one games and activities.	2.38	1.23	2.33	.96
	I have a few interests, and I concentrate deeply on them.	2.58	1.23	2.71	.78
	After working in a large group, I am exhausted.	1.81	1.05	1.67	.73
	When I am in a large group, I tend to keep silent and listen.	1.50	1.17	1.05	1.07
	I want to understand something well before I try it.	2.85	.92	2.95	1.16
Random-Intuitive		3.03	.68	3.03	.62
Concrete-Sequential		2.15	.52	2.65	.65
Closure-Oriented		2.08	.83	2.81	.72
Open	I let deadlines slide if I'm involved in other things.	2.23	1.14	2.24	.83
	I let things pile up on my desk to be organized eventually	2.04	1.13	1.76	.62
Deductive	I like to go from general patterns to the specific examples in learning a target language.	2.73	.66	2.85	1.13
	I like to begin with generalizations and then find experiences that relate to those generalizations.	2.35	.79	2.95	1.07
Inductive		2.35	.53	2.47	.52
Field-Independent		2.26	.69	2.43	.95
Field-Dependent		2.21	1.15	2.77	.88
0=never 1=rarely 2=sometimes 3=often 4=always					

As can be seen from the table, at Ankara University, the students appeared to have higher visual learning style preferences than auditory or kinesthetic, while the Trakya University students are more balanced in their preferences. . Also, when compared with Trakya University, the students at Ankara University had higher extroverted learning style preferences. As for the items regarding the introverted learning style preference, the last item for this dimension had the highest mean. That

is, the students in both settings liked to understand things before they try.

Furthermore, the items about working in groups have low means in comparison to the other items in the same set. This could be explained by the fact that there were not many introverted students in both the settings. With respect to the random-intuitive learning style preference, this dimension appeared to have the highest mean in both settings. In terms of both the concrete-sequential and the closure-oriented learning style preference, the students at Ankara University seemed to have a slightly higher mean than the students at Trakya University. As to the items in the open learning style dimension, the students' answers in both settings ranged from 1.76 to 2.23, which means that the students sometimes let deadlines slide or let things pile up on their desks. When we look at the dichotomies for the deductive and inductive learning style dimension, the students at Ankara University seemed to prefer learning deductively slightly more than inductively, whereas at Trakya, there is little difference between deductive and inductive preferences. Regarding the students' field-independence and dependence, there is little difference between the field-dependent and field-independent learning style preferences for Trakya, and a larger difference between the two for Ankara University.

With the help of the means of the students' learning style preferences and the mean scores of the class achievement tests, the relationship between the various learning styles and the classroom achievement tests was analyzed. Since the reliability of some survey items as groups of dimensions was less than 0.69, the correlations were done with single items when the Cronbach alpha was less than 0.69. However, the other items were grouped and counted as one since the Cronbach alphas were 0.69 or above.

For each dimension in the different settings, both significant and insignificant results are reported in the following tables.

Table 7 – Perceptual learning style preference and quiz means correlations

	Visual	Auditory	Kinesthetic
Ankara University quiz means (N=21)	-.22	.26	-.48*
	<i>p</i> =.33	<i>p</i> =.23	<i>p</i> =.02
Trakya University quiz means (N=26)		.08	
		<i>p</i> =.66	

* Correlation is significant at the 0.05 level (2-tailed).

Table 7 shows that there was no statistically significant correlation between the students' visual and auditory learning style preferences and the scores from the classroom achievement tests at Ankara University. Likewise, the correlation between the students' auditory learning style preferences and the scores they obtained from classroom achievement tests was not statistically significant at Trakya University. On the other hand, there was a statistically significant correlation (moderate) between the students' kinesthetic learning style preferences and their classroom achievement test performance at Ankara University. As is obvious from the table, the correlation itself is negative. Thus, it can be deduced that the more kinesthetic a student was, the less likely he was to perform better on the classroom achievement tests supported by online supplementary material. It must also be noted that the link between the students' kinesthetic learning style preferences and classroom achievement might alternatively be because of the fact that the students responded badly to the test or the class itself.

The relationship between the cognitive learning styles (extroverted/introverted, random-intuitive/concrete-sequential, closure-oriented/open, deductive/inductive, field-independent/field-dependent) and the classroom achievement tests in the two different settings are indicated in Tables 8-13.

The relationship between extroverted/introverted learning style and classroom achievement tests in the two different settings is shown in Table 8.

Table 8 – Introverted/Extroverted learning style preferences and quiz means correlations

	Introverted					
	Extroverted	I prefer individual or one-on-one games and activities.	I have a few interests, and I concentrate deeply on them.	After working in a large group, I am exhausted	When I am in a large group, I tend to keep silent and listen.	I want to understand something well before I try it.
Ankara University quiz means (N=21)	.44*	-.23	.07	-.15	-.14	.08
	<i>p</i> =.04	<i>p</i> =.30	<i>p</i> =.75	<i>p</i> =.50	<i>p</i> =.54	<i>p</i> =.71
Trakya University quiz means (N=26)	-.04	.25	-.20	-.14	-.19	.22
	<i>p</i> =.84	<i>p</i> =.20	<i>p</i> =.32	<i>p</i> =.47	<i>p</i> =.33	<i>p</i> =.26

In Table 8, we can see that the relationship between Ankara University students' extroverted learning style preferences and their success in classroom achievement was statistically significant. However, there was no significant correlation for Trakya University. As the significant correlation (moderate) is positive, it can be said that the more extroverted a student was, the better he/she tended to perform in the classroom achievement tests at Ankara University. On the other hand, it can also be said that the relationship between the extroverted learning style and the classroom achievement may be because of their good response to the tests or to the class. As for the individual items regarding the introverted learning style dimension, there were no statistically significant correlations between the students' responses for each item and their performance in the classroom achievement tests in either setting.

Random-intuitive students enjoy abstract thinking, and tend to disfavor step by step instruction, whereas concrete sequential learners prefer one-step-at-a-time activities and want to learn everything in order. Table 9 presents these two learning

style dimensions, concrete-sequential and random-intuitive, and their relationship with the classroom achievement tests.

Table 9 – Concrete-Sequential/Random-Intuitive learning style and quiz means correlation

	Random-Intuitive	Concrete-Sequential
Ankara University quiz means (N=21)	.16	-.25
	<i>p</i> =.46	<i>p</i> =.27

Table 9 reveals that there was no significant correlation between the students' random-intuitive learning style preferences and their classroom achievement test results. Additionally, the correlation between the students' concrete-sequential learning style preferences and their classroom achievement test results was not statistically significant.

Closure-oriented students pay careful attention to most of the learning tasks and language rules, whereas open learners enjoy discovery learning and are not concerned about meeting deadlines. Table 10 displays the open and closure-oriented learning style dimensions and their relationship with the classroom achievement tests in the two different settings.

Table 10 - Open/Closure Oriented learning style and quiz means correlations

	Closure-Oriented	Open	
		I let deadlines slide if I'm involved in other things.	I let things pile up on my desk to be organized eventually.
Ankara University quiz means (N=26)	-.04	.25	-.20
	<i>p</i> =.84	<i>p</i> =.20	<i>p</i> =.32
Trakya University quiz means (N=25)	.16	-.02	-.06
	<i>p</i> =.42	<i>p</i> =.91	<i>p</i> =.77

As can be seen in Table 10, the correlation between the students' closure-oriented learning style preferences and their classroom achievement test scores was not statistically significant in either of the settings. Correspondingly, with respect to

the single items for open learning style preference, there were no significant correlations between the students' responses and their performance in the classroom achievement tests in the two different settings.

Deductive students like to start with rules and theories rather than with specific examples, whereas inductive students prefer to begin with examples rather than rules or theories. Table 11 shows the relationship between the deductive/inductive learning style dimensions and the classroom achievement tests.

Table 11 – Deductive/Inductive learning style preferences and quiz means correlations

	Inductive	Deductive	
		I like to go from general patterns to the specific examples in learning a target language.	I like to begin with generalizations and then find experiences that relate to those generalizations.
Ankara University quiz means (N=21)	.13 <i>p</i> =.56	-.14 <i>p</i> =.54	-.19 <i>p</i> =.39
Trakya University quiz means (N=26)		.13 <i>p</i> =.52	-.20 <i>p</i> =.31

As can be seen in Table 11, there were no statistically significant correlations between the students' responses to the deductive learning style items and their performance in the classroom achievement tests in either setting. Furthermore, the students' inductive learning style preference at Ankara University did not correlate with the scores they obtained from the classroom achievement tests.

Field-independent learners like to separate or abstract material from within a given context, even in the presence of distractions. On the other hand, field-dependent students tend to deal with information in a more holistic way. The relationship between the students' field-independence/dependence and their performance in the classroom achievement tests is shown in Tables 12 and 13.

Table 12 – Field-Independence and quiz means correlation

Ankara University(N=20)	Field-Independent
	.38 <i>p</i> =.09

As Table 12 indicates, there was no statistically significant correlation between field-independence and the results of the classroom achievement tests.

Table 13 – Field-Dependence and quiz results correlation

Trakya University(N=26)	Field-Dependent
	-.73*
	$p=.00$

* Correlation is significant at the 0.05 level (2-tailed).

As illustrated in Table 13, there was a moderate to strong correlation between field dependence and the students' performance on classroom achievement tests. It can be concluded that the students with high field-dependence tended to perform less well on the achievement tests because the correlation is negative. It must be noted that the link between the field-dependence learning style and the classroom achievement might be attributed either to the CALL materials or to the fact that the students responded badly to the tests or to the class.

How do students with different learning styles respond to the various features of the online program?

With regard to the third research question, the CALL features questionnaire was conducted in order to observe the students' various approaches to using the online program. The main aim was to investigate whether their different learning style preferences influenced the way they used the online program. Since there were either one or few items related to the learning style dimensions in the questionnaire, the researcher did not consider the internal consistency of the items. Instead, the items were analyzed separately. Table 14 shows the means of the students' responses for each question in the CALL features questionnaire for the combined experimental groups in the two different settings.

Table 14 – Responses to the CALL features questionnaire

	N	Mean	Std. Deviation
1.I found the pictures, videos etc in the program useful	43	4.05	.785
2.I found the auditory materials in the program useful	43	3.86	.861
3.I found the activities that require to use mouse interesting	43	3.49	1.203
4.I enjoyed working with my classmates on the program in the lab	43	3.37	1.155
5.I enjoyed working independently with the program	43	3.93	1.100
6.I didn't worry about the unit order in the program while doing the activities and jumped around the modules	43	2.98	1.371
7.I paid attention to the unit and activity order in the program	42	3.19	1.383
8.I paid close attention to language rules and the explicit instructions in the program	43	3.47	1.008
9.I finished the writing assignments set via the online program on time	43	2.47	.855
10.I liked the explicit instructions in the program	42	3.76	1.055
11.I preferred discovering the rules of the language in the program	43	3.12	1.349
12.I didn't care about finishing the writing assignments set via the online program on time	43	3.30	1.225
13.I preferred to do the grammar sections in the program first	42	2.90	1.411
14.I preferred to do the reading and listening sections in the program first before grammar sections	42	3.79	1.116
15.While using the program I had no problem concentrating amid noise and confusion	42	3.31	1.115
16.I enjoyed analyzing grammar structures in the online program	43	3.00	1.069
17.I felt I had to understand every word of what I read or heard in the online program	43	3.42	1.096
18.While using the program either in the lab or at home, I preferred to work alone	43	3.79	1.186
19.After I finished the modules, receiving feedback from my teacher really didn't affect my learning at all	40	3.32	.997
20.While using the program, I needed a quiet environment in order to concentrate well	43	3.21	1.245
21.While using the program, I found grammar analysis tedious and boring	41	3.02	1.037
22.I didn't mind reading or listening in the L2 without understanding every single word as long as I caught the main idea in the online program	43	3.14	.941
23.While using the program in the lab, I really enjoyed working with other people in pairs or groups	42	2.86	1.117
24.After I finished the modules, I found the feedback given by my teacher useful as a means of understanding my problem areas	42	3.74	1.061
1=absolutely disagree 2=disagree 3=not sure 4=agree 5=absolutely agree			

The mean scores indicate that the first question has the highest average. That is to say, the students generally agreed that visuals in the program were useful. As the second highest mean score, the fifth item revealed that the students enjoyed working independently with the program. The second question also showed most of the students agreed that listening materials in the program were useful. As for the

comparatively lower means, based on the fourth item, it can be said that most of the students were not sure if the group work was effective. On the whole, it can be seen that most of the students did not respond negatively to the items in the CALL features questionnaire related to the online program.

With the aim of exploring students' different approaches to using the online program, the items in the CALL features questionnaire were correlated with the items in the LSS. As opposed to the previous analysis, the two different settings were collapsed and regarded as one for this analysis. To this end, the Cronbach alphas of the LSS were checked again as one group. Table 15 shows the Cronbach alphas of the collapsed groups.

Table 15 – Cronbach alphas for the collapsed groups, (LSS)

<i>Learning Style Dimensions</i>	Experimental Groups
Visual	.70*
Auditory	.71*
Kinesthetic	.69*
Extroverted	.72*
Introverted	.60**
Random-Intuitive	.43**
Concrete-Sequential	.70*
Closure-Oriented	.82*
Open	.22**
Deductive	.52**
Inductive	.35**
Field-Independent	.71*
Field-Dependent	.73*
* items were considered as a set	
** items within the set were considered individually	

The visual, auditory, kinesthetic, extroverted, concrete-sequential, closure-oriented, field-independent, and field-dependent learning style dimensions, which had Cronbach alphas of at least .69 were treated as a set, while the introverted,

random-intuitive, open, deductive, and inductive learning style dimensions, with Cronbach alphas of less than .69, were analyzed as individual items.

The following tables indicate both the significant and insignificant correlations between the single items or groups of items in the LSS and the students' responses on the CALL features questionnaire.

The correlation between the LSS and the CALL features questionnaire in terms of the visual learning style dimension is presented in Table 16.

Table 16 – LSS and CALL features questionnaire correlation (visual)

LSS Visual(N=43)	I found the pictures, videos etc. in the program useful
	-.068
	<i>p</i> =.332

As presented in Table 16, the correlation between the students' visual learning style preference and the answer they gave to the related question in the CALL features questionnaire was not statistically significant. Thus, it can be stated that the students' visual learning style preferences might have affected the way they used the program, but their learning style preferences did not appear to affect the way they used the features of the program mentioned in the questionnaire.

Table 17 presents the correlation between the LSS and the CALL features questionnaire in terms of the auditory learning style dimension.

Table 17 – LSS and CALL features questionnaire correlation (auditory)

LSS Auditory (N=43)	I found the auditory materials in the program useful
	-.042
	<i>p</i> =.394

As seen in Table 17, there was no statistically significant correlation between the students' auditory learning style preference and the answer they gave for the second question in the CALL features questionnaire. Therefore, we can say that their

being auditory learners might have affected the way they used the program but their learning style preferences did not appear to affect the way they used the features of the program mentioned in the questionnaire.

Table 18 displays the correlation between the LSS and the CALL features questionnaire in terms of the kinesthetic learning style dimension.

Table 18 – LSS and CALL features questionnaire correlation (kinesthetic)

LSS Kinesthetic (N=43)	I found the activities that require to use mouse interesting
	.116
	<i>p</i> =.230

As displayed in Table 18, the relationship between the students' kinesthetic learning style preference and their response for the third question in the CALL features questionnaire was not strong. Thus, it can be concluded that the students' kinesthetic learning style preference did not appear to have an impact on the way they exploited the features of the online program mentioned in the questionnaire.

The correlation between the LSS and the CALL features questionnaire in terms of the extroverted learning style dimension is shown in Table 19.

Table 19 – LSS and CALL features questionnaire correlation (extroverted)

LSS Extroverted (N=43)	I enjoyed working with my classmates on the program in the lab
	-.214
	<i>p</i> =.201

Table 19 indicates that the students' extroverted learning style preference did not correlate with the response they gave for the fourth question in the CALL features questionnaire. Hence, it can be stated that having an extroverted learning style preference did not appear to affect how they used the features of the program mentioned in the questionnaire.

Table 20 presents the correlations between the items in the LSS and the item in the CALL features questionnaire with respect to the introverted learning style dimension.

Table 20 – LSS and CALL features questionnaire correlations (introverted)

	I enjoyed working independently with the program
I am energized by the inner world (what I'm thinking inside). (N=39)	-.023 <i>p</i> =.446
I prefer individual or one-on-one games and activities. (N=43)	.071 <i>p</i> =.326
I have a few interests, and I concentrate deeply on them. (N=43)	.179 <i>p</i> =.125
After working in a large group, I am exhausted. (N=43)	.076 <i>p</i> =.313
When I am in a large group, I tend to keep silent and listen. (N=43)	.132 <i>p</i> =.200
I want to understand something well before I try it. (N=43)	.029 <i>p</i> =.426

It is shown in Table 20 that, like the extroverted learning style preference, the students' answers to the items regarding their introverted learning style preference did not statistically correlate with the answer they gave for the fifth question aiming to find their preferred way of using the online program. In other words, students' introverted learning style preference did not appear to have an influence on how they used the features of the online program mentioned in the questionnaire.

Table 21 presents the correlations between the items in the LSS and the item in the CALL features questionnaire regarding the random-intuitive learning style dimension.

Table 21 – LSS and CALL features questionnaire correlations (random-intuitive)

	I didn't worry about the unit order in the program while doing the activities and jumped around the modules
I have a creative imagination. (N=43)	-.198 <i>p</i> =.101
I try to find many options and possibilities for why something happens. (N=43)	-.068 <i>p</i> =.331
I plan carefully for future events. (N=43)	-.328* <i>p</i> =.016
I like to discover things myself rather than have everything explained to me. (N=43)	.083 <i>p</i> =.298
I add many original ideas during class discussions. (N=43)	.040 <i>p</i> =.401
I am open-minded to new suggestions from my peers. (N=43)	-.233 <i>p</i> =.067

* Correlation is significant at the 0.05 level (1-tailed).

Table 21 illustrates that, based on the single items with regard to the students' s random-intuitive learning style preference, only one item had a significant correlation (weak) with the statement "I didn't worry about the unit order in the program while doing the activities and jumped around the modules" in the CALL features questionnaire. It can be concluded that the students who prefer to plan carefully for future events worried about the order of the units while using the online program.

The correlation between the LSS and the CALL features questionnaire considering the concrete-sequential dimension is indicated in Table 22.

Table 22 – LSS and CALL features questionnaire correlation (concrete-sequential)

LSS Concrete-Sequential(N=42)	I paid attention to the unit and activity order in the program
	.105
	<i>p</i> =.255

As highlighted in Table 22, there was no statistically significant correlation between the students' concrete-sequential learning style preference and the response they gave for the seventh question regarding the introverted learning style in the CALL features questionnaire. It can be concluded that being concrete sequential

learners did not appear to influence the way the students made use of the features of the online program mentioned in the questionnaire.

Table 23 shows the correlations between the LSS and the items in the CALL features questionnaire with regard to the closure-oriented learning style dimension.

Table 23 – LSS and CALL features questionnaire correlations (closure-oriented)

LSS Closure-Oriented (N=42)	I paid close attention to language rules and the explicit instructions in the program	I finished the writing assignments set via the online program on time	I liked the explicit instructions in the program
	.476**	.350*	.232
	<i>p</i> =.001	<i>p</i> =.011	<i>p</i> =.073

** Correlation is significant at the 0.01 level (1-tailed).

* Correlation is significant at the 0.05 level (1-tailed).

As can be seen in Table 23, there was a significant correlation between the students' closure-oriented learning style preferences and two of the three related items in the CALL features questionnaire. To be more precise, since the correlations are positive, it is obvious that the students who had a closure-oriented learning style preference tended to favor paying close attention to the language rules and the explanations provided in the online program (moderate correlation) and also tended to finish the writing assignments in the online program on time (weak correlation).

Table 24 presents the correlations between the items in the LSS and the items in the CALL features questionnaire with respect to the open learning style dimension.

Table 24 – LSS and CALL features questionnaire correlations (open)

	I preferred discovering the rules of the language in the program	I didn't care about finishing the writing assignments set via the online program on time
I let deadlines slide if I'm involved in other things. (N=43)	.480** <i>p</i> =.001	.436** <i>p</i> =.002
I let things pile up on my desk to be organized eventually. (N=43)	.232 <i>p</i> =.067	.137 <i>p</i> =.190
I don't worry about comprehending everything. (N=43)	.352* <i>p</i> =.010	.077 <i>p</i> =.312
I don't feel the need to come to rapid conclusions about a topic. (N=43)	.318* <i>p</i> =.019	-.218 <i>p</i> =.081

* Correlation is significant at the 0.05 level (1-tailed).

** Correlation is significant at the 0.01 level (1-tailed).

Table 24 demonstrates that there were significant correlations between three of the items related to the students' open-oriented learning style preference and the item in the CALL features questionnaire: "I preferred discovering the rules of the language in the program". Additionally, there was a significant correlation between one of the items in the LSS: "I let deadlines slide if I'm involved in other things" and the item "I didn't care about finishing the writing assignments set via the online program on time. The students who preferred discovering the rules of the language in the program tended to let deadlines slide if they are involved in other things (moderate correlation), tended not to feel the need to come to rapid conclusions about a topic (weak correlation), and tended not to worry about comprehending everything (weak correlation). Furthermore, the students stating they preferred to let deadlines slide also did not tend to care about finishing the writing assignments in the online program on time (weak correlation).

The correlations between the items in the LSS and the CALL features questionnaire regarding the deductive learning style dimension are indicated in Table 25.

Table 25 – LSS and CALL features questionnaire correlations (deductive)

	I preferred to do the grammar sections in the program first
I like to go from general patterns to the specific examples in learning a target language. (N=43)	.022
	<i>p</i> =.446
I like to begin with generalizations and then find experiences that relate to those generalizations. (N=43)	.337*
	<i>p</i> =.015

* Correlation is significant at the 0.05 level (1-tailed).

Table 25 shows that the relationship between the students who like to begin with generalizations and then find experiences that relate to those generalizations and the CALL features questionnaire item “While using the program, I preferred to do the grammar sections first” was statistically significant. Due to the positive correlation (weak), it can be deduced from this table that students who favor beginning with generalizations tended to prefer to do the grammar sections in the online program first.

Table 26 displays the correlations between items in the LSS and the CALL features questionnaire in terms of the inductive learning style dimension.

Table 26 – LSS and CALL features questionnaire correlations (inductive)

	I preferred to do the reading and listening sections in the program first before grammar sections
I like to learn rules of language indirectly by being exposed to examples of grammatical structures and other language features. (N=43)	.107
	<i>p</i> =.250
I don't really care if I hear a rule stated since I don't remember rules very well anyway. (N=43)	.065
	<i>p</i> =.341
I figure out rules based on the way I see language forms behaving over time. (N=43)	.054
	<i>p</i> =.366

With respect to the students' inductive learning style preferences and how their preferences affected the way they used the online program, the related items in the first and the CALL features questionnaire did not correlate significantly.

The correlations between the LSS and the items in the CALL features questionnaire regarding the field-independent learning style dimension are shown in Table 27.

Table 27 – LSS and CALL features questionnaire correlations (field-independent)

LSS Field-Independent	While using the program I had no problem concentrating amid noise and confusion	I enjoyed analyzing grammar structures in the online program	I felt I had to understand every word of what I read or heard in the online program	While using the program either in the lab or at home, I preferred to work alone	After I finished the modules, receiving feedback from my teacher really didn't affect my learning at all
	.193	.515**	.259*	.009	.002
	$p=.113$	$p=.000$	$p=.049$	$p=.478$	$p=.494$
N	41	42	41	42	39

** Correlation is significant at the 0.01 level (1-tailed).

* Correlation is significant at the 0.05 level (1-tailed).

As illustrated in Table 27, there were significant correlations between the students' field-independent learning style preference and two of the items in the CALL features questionnaire. It can be deduced from the output that students who had field-independent learning style preferences tended to enjoy analyzing grammar structures (moderate correlation), and to feel that they had to understand every word of what they read or heard in the online program (weak correlation).

Table 28 presents the correlations between the LSS and the items in the CALL features questionnaire in terms of the field-dependent learning style dimension.

Table 28 – LSS and CALL features questionnaire correlations (field-dependent)

LSS Field-Dependent	While using the program, I needed a quiet environment in order to concentrate well	While using the program, I found grammar analysis tedious and boring	I didn't mind reading or listening in the L2 without understanding every single word as long as I 'catch' the main idea in the online program	While using the program in the lab, I really enjoyed working with other people in pairs or groups	After I finished the modules, I found the feedback given by my teacher useful as a means of understanding my problem areas
	.064	.070	-.039	.229	.028
	$p=.345$	$p=.334$	$p=.403$	$p=.075$	$p=.432$
N	42	40	42	41	41

As displayed in Table 28, there were no statistically significant correlations between the students' field-dependent learning style preferences and their answers for the related questions on the CALL features questionnaire. That is to say, the students' field-dependent learning style preference did not appear to influence the way they used the online program.

Conclusion

This chapter described the data analysis procedures followed throughout the study and also reported the results gathered through these procedures. The findings were interpreted in the order of the research questions. According to those results, the students studying English in a class supplemented by online learning scored higher in classroom achievement tests than the students studying English in regular classes. Additionally, with respect to the LSS, there were some significant correlations and some non-significant correlations between the students' learning style preferences and their performance in the classroom achievement tests in a class enhanced by online supplementary material. To be more precise, there was positive significant correlation (moderate) between the extroverted learning style preference and the classroom achievement tests. On the other hand, there were negative significant correlations between kinesthetic (moderate correlation) and field-dependent learning style preferences (strong correlation) and the classroom achievement tests. As for the third research question, the relationship between the students' learning style preference and their preferred way of using the online program was analyzed. According to those results, some learning style preferences of the students appeared to have an impact on how they used the features of the online program mentioned in the questionnaire, whereas others did not. To be more precise, the items related to

random-intuitive, open, and deductive learning style preferences had significant correlations ranging from .31 (weak) to .48 (moderate) with the corresponding items in the CALL features questionnaire. In addition, there were significant correlations ranging from .25 (weak) to .51 (moderate) between the students' closure-oriented and field-independent learning styles preferences and their responses related to those learning style dimensions in the CALL features questionnaire. The next chapter will first discuss the results of the study in detail, then, present the pedagogical implications followed by the limitations, and finally, make suggestions for further research.

CHAPTER V: CONCLUSION

Introduction

This study investigated the relationship between learners' learning styles and their achievement in a class supported by online supplementary material. It also sought to analyze the effectiveness of CALL supplementary materials in improving students' performance on classroom achievement tests. Finally, this study explored the possible differences in students' approaches to using the CALL material which resulted from their various learning styles.

The study was conducted in two different settings, Ankara and Trakya Universities. Thirty nine intermediate level students from Ankara University and 59 intermediate level students from Trakya University participated in the study. For the first analysis, the experimental group students were provided with an online program as a supplementary material to their course book, whereas the control group was taught with the course book only. In order to analyze their classroom achievement, they were given unit tests at the end of every week. For the second part of the analysis, the students were given an LSS and then, their learning style preferences were correlated with their classroom achievement in order to find out if there was any relationship. Finally, the students were given a CALL features questionnaire to explore whether their learning style preferences affected how they used the online program.

This chapter will present and discuss the findings of the study in light of the relevant literature. After the discussion of the findings, the limitations of the study will be described. Finally, the pedagogical implications of the study will be presented and suggestions will be provided for further research.

Findings and Discussion

The findings will be discussed according to the research questions in the following section.

What are the effects of online classes as supplementary materials on tertiary level EFL students' classroom achievement?

Before the study started, the students in the experimental and the control groups in both settings were determined to be similar in terms of language proficiency. After eight weeks of English classes supplemented by an online program, it was seen through classroom achievement tests conducted periodically throughout the research period that the experimental students in each setting had higher scores than the control groups. In other words, the students in the classes supplemented by online learning performed better on the classroom achievement tests than the students taught with regular course books. The difference between the classroom achievement test scores suggests that the online program had a positive influence on the students' achievement in the class by means of providing more practice, self-study opportunities, and motivation.

The findings of this study correspond with those of most of the research studies in the literature. For instance, Kılıçkaya (2007) found as a result of an experimental study that students in classes supplemented by online learning were better at the listening and reading sections of the TOEFL than the students taught in regular classes. Furthermore, Abuseileek and Rabab'ah (2007) also found that the experimental group in their study, which was using a computer-based grammar instructional method, did better on grammar tests than the control group, which was using a traditional grammar teaching method. In another study, Ghabanchi and

Anbarestani (2008) concluded that based on cloze tests, CALL produced better outcomes in contextualized vocabulary learning than the conventional dictionary approach. Last but not least, after a research study analyzing the previously conducted studies regarding the effectiveness of CALL during the period 1981-2005, Felix (2008) concluded that there were enough data to show that computers have a positive impact on spelling, reading, and writing.

To summarize, the research studies so far have found that on the whole, CALL has a positive influence on language learning. The skills that were tested in the present study were reading, listening, speaking, and writing. Additionally the students' grammar and vocabulary knowledge were assessed. Unlike the previous studies that tended to focus on receptive skills only, this study explored the effectiveness of CALL supplementary materials on students' overall classroom achievement evaluated by means of the unit tests, which included questions regarding the four language skills, grammar, and vocabulary.

It must be noted that only the experimental group had supplementary materials of any kind in this study, so their better performance might be attributed to the fact that they had extra materials, and spent more time and effort than the control group did. However, it also needs to be pointed out that this study did not attempt to compare CALL supplementary materials with other kinds of supplementary materials. Therefore, the findings at least show that supplementary materials in the form of CALL can be effective.

What is the relationship, if any, between learners' learning styles and their performance on the classroom achievement tests supported by online supplementary material?

The analysis investigating the relationship between the students' learning style preferences and their classroom achievement revealed that certain learning style dimensions, either as a set or the items within the set, correlated significantly with the experimental group students' classroom achievement in the two different settings. The following section will discuss the relationship between the students' perceptual (visual, auditory, kinesthetic, extroverted, and introverted) and cognitive learning styles preferences (random-intuitive, concrete-sequential, closure-oriented, open, deductive, inductive, field-independent, and field-dependent), respectively and their classroom achievement in a class enhanced by online supplementary material.

Perceptual Learning Styles

When the relationship between the students' perceptual learning styles and their performance in the classroom achievement tests was investigated, neither the students' visual nor their auditory learning style preferences correlated significantly with their performance in the classroom achievement test. However, there was a negative significant correlation (moderate) between the kinesthetic learning style preference and classroom achievement test scores. In other words, the students with kinesthetic learning style preferences tended to score lower on the classroom achievement tests. This impact might also be attributed to their poor response to the tests or to the class. Based on Reid's (1995) description in his learning styles survey, it was expected before the analysis that some features of the online program, such as using a mouse while doing drag-and-drop exercises and physically engaging

laboratory activities would appeal to students with any perceptual learning style preference. However, the correlations did not support the suggested hypothesis.

With a similar research design to the present study, Hallock, Satava, and Lesage (2003) conducted a study investigating the potential relationship between students' perceptual learning styles and their course grades in online undergraduate business courses. They found that students with auditory learning styles had a higher overall grade point average than those with visual or kinesthetic learning styles. Unlike the findings in the current study, they found a positive significant correlation between the students' auditory learning style preferences and their course grades in online undergraduate business courses. In another study, Neuhauser (2002) explored the relationship between students' perceptual learning style preferences and the effectiveness of online instruction. He concluded that because of the low or nonexistent correlation between learning style types and grades, learning style preferences had little or no impact on final grades of the students in his study. Neuhauser's study and Hallock et al.'s study have a conflict. The reason for these different findings may be explained by their different methodologies. Neuhauser (2002) compared two sections of the same course named principles of management. One section was online, whereas the other one was face-to-face. However, Hallock et al. analyzed only one group and compared the groups' performance with their learning styles. The discrepancy may also be explained by various features of the online programs. Additionally, the findings of Neuhauser's and Hallock et al.'s studies do not correspond with those of the current study. The main reason for this difference is likely to have resulted from the different majors of the students'. The present study focuses on EFL students at a tertiary level. However, Neuhauser's

study and Hallock's et al. study deal with business students. Finally, the features of the online materials used in the research might have created the difference.

Extroverted/Introverted Learning Styles

With respect to the extroverted learning style dimension, there was a significant correlation (moderate) between the Ankara University students' extroverted learning style preferences and their classroom achievement. In other words, the more extroverted a student was, the more successful he/she tended to be in the classroom achievement tests. This suggests that the students with extroverted learning style preferences may have benefitted from the online program. This relationship may be explained by some features of the program. For instance, the games and conversation tasks in the online program, and the opportunity to work together with classmates in the laboratories are likely to have influenced the students with extroverted learning style preferences positively, leading to effective use of the program and ultimately, a better performance in the class. Unlike the results at Ankara University, there was no statistically significant correlation between the Trakya University students' extroverted learning style preferences and their classroom achievement. The difference between the two different settings might be due to the students' social backgrounds or their previous learning experiences. In addition, the Trakya students were less extroverted than the Ankara students, and this may explain the lack of correlation. With regard to the introverted learning style, the items within the dimension did not correlate significantly with the students' classroom achievement in either of the settings. The researcher expected to find a relationship because introverted students tend to use computers a lot more frequently than extroverted students (Cohen et al., 2001), which was likely to affect their

performance in the classroom achievement tests. However, the findings contradict the researcher's predictions. In a similar study, Neuhauser (2002) investigated the relationship between the effectiveness of online education vs. face-to-face education and learning styles. He concluded that there were no significant correlations between the students' final grades and their extroverted/introverted learning style preferences. The findings of Neuhauser's study did not correspond with the current study in that there was no statistically significant correlation between the students' extroverted learning style and their final grades. The reason for this difference may be explained by the lack of laboratory facilities in Neuhauser's study through which the students had the chance to work together.

Random-Intuitive/Concrete-Sequential Learning Styles

Students' random-intuitive and concrete-sequential learning style preferences did not affect the students' classroom achievement. In contrast, a study conducted by Ross and Schulz (1999) found that students' concrete-sequential and random-intuitive learning style preferences affected their achievement levels. The correlations indicated that random-intuitive learners had significantly lower achievement levels. On the other hand, the more concrete-sequential a learner was, the higher achievement level he/she had. Similarly, Gregorc (1985) believes that the sequential learning style predisposes the individual to having a preference for working with computers. The findings of Ross and Schulz' study contradict the findings of the current study. This contradiction may be explained by the fact that the participants in the present study employed the online program as a supplement to their course materials. They were not directed by the teachers and they were free to choose on which section of the program they wish to work. The random-intuitive

students were expected to benefit more from this instruction approach but the correlations did not support the predictions of the researcher. As a result, it can be said that the students on both sides of the dichotomy made use of the program due to its flexible features. Thus, if the students performed differently, the reason cannot be attributed to this particular learning style dichotomy. The flexibility of the program appears to have accommodated both of them.

Closure-Oriented/Open Learning Styles

The correlation between the students' closure-oriented learning style preferences and their classroom achievement test scores was not statistically significant. Likewise, the items within the open learning style dimension did not significantly correlate with the students' classroom achievement. These two dichotomies are regarded as aspects of personality type. Ehrman and Oxford (1990) found a number of significant relationships between personality type and L2 proficiency in native-English-speaking learners of foreign languages. However, this relationship was not seen between students' open and closure-oriented learning styles and their classroom achievement in the current study. As Ehrman and Oxford (1990) state, closure-oriented students want clarity as soon as possible. They are hardworking students and they favor assignments with deadlines. On the other hand, open style learners treat L2 learning like a fun activity rather than set of tasks to be achieved. Because of the features of the online program and its implementation as a supplement, a tool students can self access and work at their own pace and style, the students with open learning style preferences were expected to benefit more from the program and score higher in the classroom achievement tests, but the findings failed to prove this presupposition. The program appears to accommodate both styles,

which may be why no relationship is seen. It must also be pointed out that no study has looked at this particular dimension in relation to CALL before, so this finding represents a new contribution to the literature.

Deductive/Inductive Learning Styles

With respect to the deductive learning style dimension, the findings did not show any significant correlations between the students' responses to the items within the deductive dimension and their classroom achievement in both the settings. Correspondingly, the students' inductive learning style did not correlate with their classroom achievement. In a study which analyzed the relationship between tertiary level students' deductive and inductive learning style preferences and their achievement in foreign language learning, Cesur (2009) found a very strong relationship between both deductive and inductive learning style preferences and classroom achievement. It must be noted that the fact that Cesur was not looking at online learning may explain the difference between the two studies. It was claimed at the beginning of the study that the students with inductive preferences and students with deductive learning style preferences were both expected to benefit from the online program due to its features, which enabled students to start with grammar rules or start with reading and listening sections first. Thus, as also mentioned for the previous dichotomy, the program appears to accommodate both styles, and that why no relationship is seen.

Field-Dependent/Field-Independent Learning Styles

There was a statistically significant correlation (strong) between students' field-dependent learning style preferences and their classroom achievement test performances and this was the strongest relationship throughout the study. In

addition, since the correlation was negative, the more field-dependent a student was, the less well he/she tended to do on the classroom achievement test. Given this relationship, it might be expected that a positive correlation would be seen between classroom achievement and field-independence. This relationship might be attributed to online supplementary material as well as the students' poor response to the tests or to the class. However, field-independence did not significantly correlate with classroom achievement, although the data appeared to show a trend toward a weak positive correlation ($r=.38, p=.09$). Previous research has found that field-independent learners are generally more successful at language learning than field-dependent learners (Carter, 1988; Chapelle & Green, 1992; Chapelle & Jamieson, 1986; Chapelle & Roberts, 1986; Hansen & Stansfield, 1982). Additionally, Chapelle and Jamieson (1986) stated that field-independent learners are more likely to profit from using CALL. On the other hand, in another study, Liu and Reed (1995) found that field-dependent and field-independent students learned vocabulary equally well using a computer program. Therefore, it cannot be said that the results of this study are in line with all the previous research studies. Based on the research conducted so far, it can be concluded that the present study partially supports the previous studies.

How do students with different learning styles respond to the various features of the online program?

In order to investigate whether the students' learning style preferences influenced the way they used the online program, they were given a CALL features questionnaire. The responses of the students to the CALL features questionnaire were correlated with their responses to the LSS. The mean scores of the items in the CALL features questionnaire showed that few of the students responded with

'absolutely disagree', or *'disagree'*, which means that on the whole, the students did not respond negatively to the items in the CALL features questionnaire related to online supplementary material. The first question about the visual elements of the program had the highest mean (4.05), which means that almost all the students found the pictures and videos in the program useful. The ninth question about closure-oriented learning style preference had the lowest mean (2.47). Therefore, it can be concluded that on average, the students either did not finish the writing assignments set via the online program on time or were not sure they did.

With respect to the correlations between the LSS and the CALL features questionnaire in both settings, the following sections will discuss the relationship between particular learning style dimensions and the students' approaches to using the CALL material.

Perceptual Learning Styles

None of the perceptual learning styles correlated significantly with the corresponding questions in the CALL features questionnaire. In other words, none of them affected the way the students used the features of the online program mentioned in the questionnaire. At the beginning of the present study, the features of the online program and the learning style dimensions made the researcher think that CALL would appeal to students with any perceptual style. As Reid (1995) describes in her perceptual learning-style preference questionnaire, visual learners learn well from seeing words in books, on the board, and on the computer. Auditory learners learn better through hearing words and with the help of oral explanations, which were present in the online program. Cohen et al. (2001) stated that kinesthetic learners learn best through experience, by way of being physically engaged in classroom

activities. In the present study, the laboratory facilities made these group work activities possible. In the first analysis exploring the relationship between students' learning styles and their classroom achievement, the kinesthetic learning style preference was found to be the only significant correlation and this correlation was negative. It was predicted by the researcher that the online program would appeal to all the students with any perceptual learning style preference. As Wehrwein, Lujan and DiCarlio (2007) state, categorizing students neatly into perceptual learning styles can be misleading. Therefore, if we think that the students in the present study have a mix of learning style preferences, it could explain why no significant correlations were found. The last point to emphasize is that, the program accommodates all of the perceptual learning styles, and so students who have mixed preferences can enjoy all aspects, and benefit from the program.

Extroverted/Introverted Learning Styles

Like the perceptual learning styles, neither the students' extroverted learning style preferences nor their responses to the items within the introverted dimension correlated significantly with their responses to the corresponding items in the CALL features questionnaire. Thus, it can be deduced that neither the students' extroverted learning style preferences nor introverted learning styles affected the way they used the features of the online program mentioned in the questionnaire. It was thought at the beginning of the present study that the introverted students tend to use computers a lot more frequently than extroverted students (Cohen et al., 2001). Thus, it was predicted that they would favor the online program and their learning style preferences would affect the way they exploited the online program. On the other hand, the facilities in the laboratories provided the students with group work

opportunities and the extroverted students were assumed to favor those types of activities. As Reid (1995) describes, students with extroverted learning styles learn more easily when they study at least in pairs and they succeed better when they work with others. In the first correlation analysis based on the second research question, it was found that the students' extroverted learning style preference had an influence (moderate) on their classroom achievement. Although the correlation in the first analysis supported the researcher's presupposition, the correlation in the second analysis failed to confirm the researcher's predictions. The reason behind this finding might be explained by the fact that the online program appealed to the students at both ends of the dichotomy.

Random-Intuitive/Concrete-Sequential Learning Styles

As for the random-intuitive dimension, apart from only one item, there were no significant correlations between the items in the LSS and the item "I didn't worry about the unit order in the program while doing the activities and jumped around the modules" in the CALL features questionnaire. However, there was a significant correlation (weak) between the students' responses to the random-intuitive item "I plan carefully for future events" in the LSS and the students who said they did not worry about the unit order in the program while doing the activities and jumped around the modules. As the correlation was negative, it can be said that the students who prefer to plan carefully for the future events tended to worry about the unit order in the online program and they did not jump around the modules. The reason for this negative correlation within the random-intuitive items may be due to the wrong selection of a feature of the program thought to correspond with the random-intuitive learning style dimension. As for the concrete-sequential dimension, no significant

correlations were found. Regarding the first analysis between the students' random-intuitive and concrete-sequential learning style preferences and their classroom achievement, no significant correlations were observed. Before the analysis, based on the description by Cohen et al. (2001), the random-intuitive learners were predicted to benefit more from the online program due to its self-initiated application as a supplement. Cohen et al. (2001) stated in their learning style survey that random-intuitive learners are more future-oriented, enjoy abstract thinking, and they usually dislike step-by-step instruction. On the other hand, concrete-sequential learners are more present-oriented, prefer one-step-at-a-time activities, and want to know where they are going in their learning at every moment. Additionally, when the features of the online program were taken into consideration, it was also predicted that the online program would appeal to random-intuitive learners more, and as a result, affect the way they used the program. However, the findings did not support the suggested hypothesis. As stated for the previous dichotomy, the reason behind this finding might also be the fact that the online program appealed to the students at both ends of the dichotomy, by allowing them to access the materials in any way they chose.

Closure-Oriented/Open Learning Styles

There were significant correlations between the students' closure-oriented learning style preferences and the corresponding items in the CALL features questionnaire. Positive correlations indicated that the students' closure-oriented learning style preferences lead them to pay close attention to language rules and the explicit instructions in the program (moderate correlation) and they preferred to finish the writing assignments on time (weak correlation).

Additionally, although the correlation is not significant, the third item within the dimension shows a trend towards a positive (although weak) correlation ($r=.232$, $p=.07$). Considering that this approach is suitable for these type of learners, their learning style preference may have had some influence on how they made use of the features of the online program mentioned in the questionnaire. However, based on the correlations in the previous analysis, the students' preferred ways of learning did not have a positive impact on their classroom achievement.

With regard to the items in the open learning style dimension, one of the significant correlations demonstrated that the students who let deadlines slide if they are involved in other things preferred discovering the rules of the language in the program (moderate correlation) and did not care about finishing the writing assignments set via the online program on time (moderate correlation). As for another item within the set, the students who prefer not to worry about comprehending everything tended to prefer discovering the rules of the language in the program (weak correlation). Additionally, the students who do not feel the need to come to rapid conclusions about a topic also tended to prefer the discovery grammar learning approach while using the online program (weak correlation). Based on the correlations of the single items ranging from .31 (weak) to .48 (strong) within the open learning style dimension, the students' learning style preferences seem to have affected the way they learn grammar and their approach to the writing assignments set via the online program. By looking at the significant correlations considering the dichotomies, closure-oriented and open, it must be noted that the features of the online program seem to have affected the students at both ends of the dichotomy. This was not the prediction before the study started. Since the online

program would be used as a supplementary material and there would not be teacher-directed instruction, the online program was predicted to appeal to the open side of the dichotomy. As Knight, Elfenbein, and Martin (1997) state, closure-oriented students prefer a planned and orderly way of learning. They feel more comfortable when decisions are made and they also like to bring life under control as much as possible. On the other hand, students with an open learning style prefer a flexible and spontaneous way of life. They like to understand and adapt to the world rather than organize it. They are seen as staying open to new experiences and information. Although significant correlations can be seen in the second analysis about the students' responses to the items in the LSS and the CALL features questionnaire, no significant correlations were seen in the first analysis investigating the relationship between the students' learning styles and their classroom achievement. Hence, it is possible to say that though the students' learning style preferences appeared to affect the way they used the features of the online program mentioned in the CALL features questionnaire, it did not appear to influence their classroom achievement.

Deductive/Inductive Learning Styles

One of the items within the deductive learning style dimension "I like to begin with generalizations and then find experiences that relate to those generalizations" correlated significantly and positively (although weak) with the item "I preferred to do the grammar sections in the program first" in the CALL features questionnaire. Therefore, it can be deduced from the students' responses that their preferred way of learning tended to affect the way they learnt grammar in the online program. In terms of the features of the deductive learning style preference, this is an expected finding based on the description by Richards. As Richards and Rodgers

(1994) explain, deductive learners prefer to begin with general principles and to deduce consequences. Since deduction tends to be more concise and orderly than induction, students who prefer a highly structured presentation are likely to prefer a deductive approach.

With regard to the other side of the dichotomy, the students' inductive learning style preferences did not appear to have an impact on how they preferred to use the features of the online program in the questionnaire. The researcher had a prediction that the flexible features of the program would be likely to appeal to inductive learners by allowing them to start with listening and reading sections first before they do the grammar sections based on a description by Richards and Rodgers (1994). He states that inductive learners prefer to learn by seeing observations, experimental results, and numerical examples first and then continue with governing principles and theories by inference. However, the findings did not support the researcher's view. It is also important to note that, neither the students' inductive nor their deductive learning style preferences affected their performance in the classroom achievement tests. The online program was expected to appeal to both sides of the dichotomy before the analysis. In the end, it was revealed that neither the students' deductive learning style nor their inductive learning style preferences seemed to have an effect on their classroom achievement or their preferred ways of using the online program except for one item within the deductive learning style dimension. In the light of these findings, it can be concluded that the online program appealed to the students at both ends of the dichotomy.

Field-Independent/Field-Dependent Learning Styles

Two significant correlations were seen between the students' field-independent learning style preferences and their responses to two of the items related to field-independence in the CALL features questionnaire. According to those correlations, the field-independent students tended to enjoy analyzing grammar structures in the online program (moderate correlation). It should be noted that this correlation was one of the strongest correlations throughout this study. Moreover, the field-independent students also tended to feel they had to understand every word of what they read or heard in the online program (weak correlation). As Chapelle and Jamieson (1986) stated, field-independent learners are more likely to benefit from using CALL. As also mentioned in the first correlation analysis, there are some other studies claiming field-independence to be more advantageous in second language learning. Therefore, the researcher expected to find as a result of the current study that a field-independent learning style preference would lead to a higher performance in classroom achievement tests. The hypothesis appeared to be in parallel with the previous research in that high field-dependence caused a worse performance in the classroom achievement tests. However, field-independence did not significantly correlate with classroom achievement, although the data appeared to show a trend toward a positive correlation (weak) ($r=.38, p=.09$). On the other hand, a negative and significant correlation (strong) was observed between the students' field-dependent learning style preferences and their classroom achievement. These findings confirmed the hypothesis that was suggested at the beginning of the study. In addition, the students' field-independent learning style preferences affected the

way they exploited the features of the online program mentioned in the questionnaire, which also supported the previously suggested hypothesis.

Limitations

The limited number of participants can be regarded as the first limitation of the study since there were only forty-eight students whose learning style preferences were correlated with their classroom achievement. If there had been more participants, more significant and more generalizable results could have been obtained.

Time constraints are likely to be the second limitation of this study. There were eight weeks of observation and the students were given five achievement tests. Although the online program proved to be effective at the end of this observation period, if the students had spent more time using the online program and getting used to all its features, more evidence of the influence of learning styles might have been seen.

Thirdly, the fact that the experimental and the control groups had different teachers might have affected the difference in the classroom achievement tests. If both the groups had had the same teachers, the situation would have been more controllable, and evidence for the effectiveness of the CALL supplementary materials would be stronger.

Another limitation of the current study is the reliability problems with the instruments. While analyzing the relationship between the students' learning styles and their classroom achievement, low Cronbach alphas regarding particular learning style dimensions emerged and this problem meant that questionnaire items were correlated individually, rather than as a set representing a particular learning style

dimension. If the instruments had been more reliable, it is possible that more significant correlations could have been observed between learning styles and the effectiveness of CALL.

Finally, although the relationship between the experimental group students' learning style preferences and their classroom achievement was investigated, the same relationship was not investigated in the control group. Thus, we cannot be sure that the observed correlations between achievement and learning styles are related to the CALL program, and not just to how students of various learning styles respond to tests or even the classroom situation or their teachers.

Pedagogical Implications

As CALL develops and new programs are produced every day, teachers are increasingly concerned with finding appropriate computer-assisted language learning materials (Wild, 1996). In addition, as new online materials are produced with various features, they have the capacity to appeal to most of the students with different learning style preferences.

This study has yielded valuable information about the effectiveness of CALL supplementary materials, and the relationship between students' learning style preferences and their achievement in a class enhanced by online supplementary material. The results of the first analysis indicated that CALL supplementary materials created a difference in the students' classroom achievement. Therefore, it must be noted that online learning has a positive impact on students' performance in class. As Ayres (2002), Jarvis and Szymczyk (2009), and Kılıçkaya (2007) stated, students are not ready for full integration of computers into language learning. The students also favor the idea of computer assistance in their classes (Kılıçkaya, 2007;

Sagarra & Zapata, 2008). In the current study, CALL material helped the students score higher in the classroom achievement tests than the students who were taking regular classes. Teachers should make use of CALL materials in their classes and also integrate online learning into their instruction. Instead of having classes fully taught through computers, using computers and the Internet as a supplement in order to provide students with extra practice, self-study opportunities, and an alternative to their regular input is likely to contribute to their language development.

With regard to the second analysis, it was revealed that there was not a strong relationship between the students' learning style preferences in general and their achievement in a class supplemented by online learning. The reason for the non-significant correlations may be due to the fact that the features of the online program appealed to both ends of the learning style dichotomies investigated. Lastly, it is also possible to say that students with any learning style preference can make use of the online program but their classroom achievement may not be attributed to their learning styles.

In terms of the last analysis and its implications, not all the learning style preferences affected the way the students used the online program, although specific learning style preferences like random-intuitive, open, and deductive learning style dimensions appeared to influence the students' online learning experience. With better instruments and more time, stronger correlations, leading to stronger conclusions, might have been found. Therefore, not having many correlations in the current study should not mean that teachers do not need to consider their students' learning style preferences while they are deciding which program to use or if they will supplement their classes with online learning. As Zapalska and Brozik (2006)

state, it is critical that teachers consider the learning styles of students. They further state that in order to teach more efficiently with online learning, instructors need to know more about learner differences and how to address the variety of learning style preferences. Instructors who are aware of these differences in learning styles are better capable of adapting their teaching strategies and techniques in online education. This can help ensure that their methods, materials, and resources fit the students' preferred ways of learning and eventually, a learning environment that the students can take full advantage of is created. Though not all the learning styles affected the students' preferred way of exploiting the online program in the current study, the importance of learning styles in language learning should not be ignored. On the contrary, learning styles need to be taken seriously, as has been found in previous research which indicated that students' learning styles have an impact on how they learn a foreign language. Keobke (1998) states that in an ideal world, CALL software programs would adjust themselves to each learner and offer a number of features that will match all individual learning styles. However, since this is not possible in our time, teachers need to be aware of their students' learning style preferences beforehand so that they can choose the best CALL material to match their students' preferred ways of learning.

Suggestions for Further Research

As was pointed out in the previous section, several limitations of this study require further research with more participants for a longer time. This study can also be replicated by using another online program with different features to see if there will be any difference in terms of the relationship between the students' learning styles and their classroom achievement. Alternatively, instead of classroom

achievement, the relationship between the students' learning styles and their proficiency level gains based on the four language skills, reading, listening, writing, and speaking, can be analyzed.

Further research about CALL used not as a supplement for self-study by the students but as a teacher-directed and in-class material would also contribute valuable information to the literature. Furthermore, comparing CALL supplementary material with other kinds of supplementary material could yield useful information.

Finally, since some problems about reliability issues regarding the LSS have emerged, this study can be replicated with more reliable instruments.

Conclusion

This study shed light on the effectiveness of online learning as supplementary material on students' classroom achievement. More importantly, though not as a whole, it revealed a relationship between particular learning style dimensions and students' classroom achievement in a class enhanced by online supplementary material. Lastly, this study also showed that certain learning style preferences may have affected the way students used the online program. No previous research study has ever sought to explore the different approaches to using online programs owing to different learning style preferences. Therefore, this study can be said to have provided valuable information for the literature.

As the findings suggest, students' learning style preferences should be taken into consideration while deciding which online materials to use or how to use them. Additionally, since the experimental groups in the study scored higher in the classroom achievement tests, it can be said that a class supplemented by online learning is more effective than a class taught traditionally, without online materials,

in terms of students' classroom achievement. In the light of these findings, it is possible to conclude that the effectiveness of online supplementary materials cannot be ignored and students' learning style preferences appear to have some impact on how they make use of the online program.

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APPENDIX A: SAMPLE CLASSROOM ACHIEVEMENT TEST

LANGUAGE AND SKILLS TEST 1 B UNITS 1-2

VOCABULARY AND GRAMMAR

1 Put the words in the correct order and add *a* and *with* where necessary to make a sentence

0 cap black NY Yankees logo baseball

A black baseball cap with a NY Yankees logo.

1 dress short black tight

2 top hood baggy new

3 dirty T-shirt picture on it white

4 leather boots long trendy

5 yellow and red school striped tie

6 nylon socks grey cheap

2 Complete the sentences with the words from the box. There are three words that you don't need.

phonebook / dead / dial / ~~battery~~ / ring / alert / voicemail / signal / folder
text

How to use your mobile phone.

Make sure your ⁰ battery is new or charged, otherwise you may find that your
¹ _____ strength is too low to be able to use the phone.

Choose a ² _____ tone. The phone will have a few to choose from or you can
download new ones. Remember, though, that when you are in a quiet place such as a cinema or
library, you should switch to a vibrating ³ _____ so that you don't disturb anyone.
You can also use ⁴ _____ which answers your calls for you while you are busy.

The phone will have its own ⁵ _____ where you can store numbers you often use.
That means you don't have to ⁶ _____ the numbers yourself, you just click the
name and the number will be called automatically.

3 Circle the correct answer.

Dear Sir,

I'm writing in response to your article: 'What's wrong with our town?' In my opinion, one of the biggest problems is the state of the town centre. None of the phones ⁰ _____ for ages, even the one in the police station is out of ¹ _____.

Shopping is also a nightmare. Why doesn't someone tell shop owners to turn ² _____ the music playing in their shops? I was with my daughter looking for a pair of trousers and we couldn't talk to ³ _____ it was so loud. How can a shopkeeper hear customers when they can't even hear ⁴ _____.

I was so angry that my daughter had to take me for a cup of coffee to ⁵ _____ down. Thank goodness for Melba coffee bar. I've been going there ⁶ _____ I was a young girl and it's still the best place in town.

Yours,

Mary Davies

- | | | | | |
|---|---------------|--------------|---------------------|---|
| 0 | a are working | b work | c have been working | <input checked="" type="checkbox"/> d have worked |
| 1 | a work | b order | c control | d place |
| 2 | a out | b over | c away | d down |
| 3 | a us | b ourselves | c each other | d the other |
| 4 | a their self | b themselves | c them | d each other |
| 5 | a relax | b switch | c calm | d come |
| 6 | a from | b after | c for | d since |

/ 6

4 Put the verbs in brackets into the correct form.

- 0 I don't often (not/often) wear make-up.
- 1 They _____ (play) in a group together for over a year.
- 2 I _____ (be) a Goth since last year.
- 3 I _____ (not/usually/wear) smart clothes.
- 4 How long _____ (you/write) poetry?

- 5 How often _____ (you/surf) the Internet?
 6 How long _____ (you/belong) to this club?

/ 6

5 Complete the text with one word in each gap.

Dear Sir,

Thank you for your recent application to join the Society Club. As you know, we have
 0 been in existence 1 _____ the beginning of the nineteenth century
 and we like to think of 2 _____ as being one of the most exclusive clubs in the
 country. As you made the application 3 _____ and don't have a current member to
 speak for you, I'm sure you won't mind answering an important question so that we can decide
 whether you should be allowed to join our society.

We are a completely non-political society and, in almost two hundred years, we have
 4 _____ allowed anyone to join who has belonged to a political party so I have to
 ask: 5 _____ you now a member, or 6 _____ you ever been a member
 of a political party? If so, then, I'm afraid, we cannot allow you to join.

I look forward to hearing from you.

Yours faithfully,

Lord Percy Hodge

/ 6

LISTENING SKILLS

1 CD Track 2 Listen to a radio interview with a member of a club. Circle the correct answers.

- 1** The guest thinks that PG Wodehouse
- a** had a pretty face.
 - b** deserves our respect.
 - c** wore strange clothes.
 - d** should have a fan club.
- 2** The guest likes PG Wodehouse's
- a** life.
 - b** books.
 - c** country estates.
 - d** friends.
- 3** The guest has read
- a** all of PG Wodehouse's books.
 - b** everything that PG Wodehouse wrote.
 - c** everything about PG Wodehouse.
 - d** over seventy books by PG Wodehouse.
- 4** The presenter
- a** thinks £15 is too much to pay for membership.
 - b** wants to know how much profit the society makes.
 - c** wants to know what the members get for their money.
 - d** wants to join the society.

- 5** The society
- a** doesn't allow members younger than 32 years of age.
 - b** is over thirty years old.
 - c** has more members than before.
 - d** is only for young people.
- 6** The man and his wife get on well because
- a** they are very passionate.
 - b** they share the same interest.
 - c** they met at one of the society's meetings.
 - d** they have been married for twenty one years.
- 7** Which of the following is NOT true?
- a** The man has got two children.
 - b** The children might read PG Wodehouse books in the future.
 - c** The children are in their teens.
 - d** The parents don't want to read their children PG Wodehouse books at the moment.

COMMUNICATION

1 Complete the dialogues with the words from the box.

opinion / seems / far / personally / look / knows / mean / ask think
--

In my ⁰ opinion, every student should have to join at least one school club or society. Everybody ¹ _____ that most students just waste their time surfing the net or watching TV. If you ² _____ me, they could spend the time much better at school. I ³ _____ there are loads of things you can do – chess, debates, sports, drama.

Well, ⁴ _____, I think you're wrong. It ⁵ _____ wrong to force people to do what they don't want to do. ⁶ _____ at normal classes, they get disrupted by kids who don't want to be there. If you ⁷ _____ about it, your nice little after school clubs would be ruined by the kids who didn't want to go.

You could be right I suppose but, as ⁸ _____ as I'm concerned, they're an excellent thing for bored teenagers to go to.

/ 8

WRITING

- Write a letter to your friend in Malta telling him/her about a recent unpleasant experience.

--

TOTAL / 50

APPENDIX B: LEARNING STYLE SURVEY (ENGLISH VERSION),
INFORMED CONSENT FORM

This study is conducted by Hakan Cangır, who works as an English lecturer at Ankara University and is currently doing his MA at Bilkent University. The main aim of the study is to investigate (a) the effectiveness of CALL supplementary materials on students' overall classroom achievement, (b) the relationship between students' learning styles and their classroom achievement after instruction supported by online learning, and (c) differences in students' approaches to using the CALL material due to their various learning styles. Thank you for your participation in the survey in advance. If you want detailed information about the study, please do not hesitate to contact Hakan Cangır via (hcangir@bilkent.edu.tr).

Learning Style Survey: Assessing Your Own Learning Styles

Andrew D. Cohen, Rebecca L. Oxford, and Julie C. Chi

The Learning Style Survey¹ is designed to assess your general approach to learning. It does not predict your behavior in every instance, but it is a clear indication of your overall style preferences. For each item, circle the response that represents your approach. Complete all items. There are 11 major activities representing 12 different aspects of your learning style. When you read the statements, try to think about what you usually do when learning. It typically takes about 30 minutes to complete the survey. Do not spend too much time on any item—indicate your immediate feeling and move on to the next item.

For each item, circle your response:

- 0 = Never
- 1 = Rarely
- 2 = Sometimes
- 3 = Often
- 4 = Always

Part 1: HOW I USE MY PHYSICAL SENSES

1. I remember something better if I write it down.	0	1	2	3	4
2. I take detailed notes during lectures.	0	1	2	3	4
3. When I listen, I visualize pictures, numbers, or words in my head.	0	1	2	3	4
4. I prefer to learn with TV or video rather than other media.	0	1	2	3	4
5. I use color-coding to help me as I learn or work.	0	1	2	3	4
6. I need written directions for tasks.	0	1	2	3	4
7. I have to look at people to understand what they say.	0	1	2	3	4
8. I understand lectures better when professors write on the board.	0	1	2	3	4
9. Charts, diagrams, and maps help me understand what someone says.	0	1	2	3	4
10. I remember peoples' faces but not their names.	0	1	2	3	4
	A - Total _____				
12. I prefer to learn by listening to a lecture rather than reading.	0	1	2	3	4
13. I need oral directions for a task.	0	1	2	3	4
14. Background sound helps me think.	0	1	2	3	4
15. I like to listen to music when I study or work.	0	1	2	3	4
16. I can understand what people say even when I cannot see them.	0	1	2	3	4
17. I remember peoples' names but not their faces.	0	1	2	3	4
18. I easily remember jokes that I hear.	0	1	2	3	4
19. I can identify people by their voices (e.g., on the phone).	0	1	2	3	4
20. When I turn on the TV, I listen to the sound more than I watch the screen.	0	1	2	3	4
	B - Total _____				
21. I prefer to start doing things rather than checking the directions first.	0	1	2	3	4
22. I need frequent breaks when I work or study.	0	1	2	3	4
23. I need to eat something when I read or study.	0	1	2	3	4
24. If I have a choice between sitting and standing, I'd rather stand.	0	1	2	3	4
25. I get nervous when I sit still too long.	0	1	2	3	4
26. I think better when I move around (e.g., pacing or tapping my feet).	0	1	2	3	4
27. I play with or bite on my pens during lectures.	0	1	2	3	4
28. Manipulating objects helps me to remember what someone says.	0	1	2	3	4
29. I move my hands when I speak.	0	1	2	3	4
30. I draw lots of pictures (doodles) in my notebook during lectures.	0	1	2	3	4
	C - Total _____				

Part 2: HOW I EXPOSE MYSELF TO LEARNING SITUATIONS

1. I learn better when I work or study with others than by myself.	0	1	2	3	4
2. I meet new people easily by jumping into the conversation.	0	1	2	3	4
3. I learn better in the classroom than with a private tutor.	0	1	2	3	4
4. It is easy for me to approach strangers.	0	1	2	3	4
5. Interacting with lots of people gives me energy.	0	1	2	3	4
6. I experience things first and then try to understand them.	0	1	2	3	4

A - Total _____

7. I am energized by the inner world (what I'm thinking inside).	0	1	2	3	4
8. I prefer individual or one-on-one games and activities.	0	1	2	3	4
9. I have a few interests, and I concentrate deeply on them.	0	1	2	3	4
10. After working in a large group, I am exhausted.	0	1	2	3	4
11. When I am in a large group, I tend to keep silent and listen.	0	1	2	3	4
12. I want to understand something well before I try it.	0	1	2	3	4

B - Total _____

Part 3: HOW I HANDLE POSSIBILITIES

1. I have a creative imagination.	0	1	2	3	4
2. I try to find many options and possibilities for why something happens.	0	1	2	3	4
3. I plan carefully for future events.	0	1	2	3	4
4. I like to discover things myself rather than have everything explained to me.	0	1	2	3	4
5. I add many original ideas during class discussions.	0	1	2	3	4
6. I am open-minded to new suggestions from my peers.	0	1	2	3	4

A - Total _____

7. I focus on a situation as it is rather than thinking about how it could be.	0	1	2	3	4
8. I read instruction manuals (e.g., for computers or VCRs) before using the device.	0	1	2	3	4
9. I trust concrete facts instead of new, untested ideas.	0	1	2	3	4
10. I prefer things presented in a step-by-step way.	0	1	2	3	4
11. I dislike it if my classmate changes the plan for our project.	0	1	2	3	4
12. I follow directions carefully.	0	1	2	3	4

B - Total _____

Part 4: HOW I DEAL WITH AMBIGUITY AND WITH DEADLINES

- | | | | | | |
|--|---|---|---|---|---|
| 1. I like to plan language study sessions carefully and do lessons on time or early. | 0 | 1 | 2 | 3 | 4 |
| 2. My notes, handouts, and other school materials are carefully organized. | 0 | 1 | 2 | 3 | 4 |
| 3. I like to be certain about what things mean in a target language. | 0 | 1 | 2 | 3 | 4 |
| 4. I like to know how rules are applied and why. | 0 | 1 | 2 | 3 | 4 |

A - Total _____

- | | | | | | |
|--|---|---|---|---|---|
| 5. I let deadlines slide if I'm involved in other things. | 0 | 1 | 2 | 3 | 4 |
| 6. I let things pile up on my desk to be organized eventually. | 0 | 1 | 2 | 3 | 4 |
| 7. I don't worry about comprehending everything. | 0 | 1 | 2 | 3 | 4 |
| 8. I don't feel the need to come to rapid conclusions about a topic. | 0 | 1 | 2 | 3 | 4 |

B - Total _____

Part 8: HOW I DEAL WITH LANGUAGE RULES

- | | | | | | |
|---|---|---|---|---|---|
| 1. I like to go from general patterns to the specific examples in learning a target language. | 0 | 1 | 2 | 3 | 4 |
| 2. I like to start with rules and theories rather than specific examples. | 0 | 1 | 2 | 3 | 4 |
| 3. I like to begin with generalizations and then find experiences that relate to those generalizations. | 0 | 1 | 2 | 3 | 4 |

A - Total _____

- | | | | | | |
|---|---|---|---|---|---|
| 4. I like to learn rules of language indirectly by being exposed to examples of grammatical structures and other language features. | 0 | 1 | 2 | 3 | 4 |
| 5. I don't really care if I hear a rule stated since I don't remember rules very well anyway. | 0 | 1 | 2 | 3 | 4 |
| 6. I figure out rules based on the way I see language forms behaving over time. | 0 | 1 | 2 | 3 | 4 |

B - Total _____

Part 9: HOW I DEAL WITH MULTIPLE INPUTS

- | | | | | | |
|--|---|---|---|---|---|
| 1. I can separate out the relevant and important information in a given context even when distracting information is present. | 0 | 1 | 2 | 3 | 4 |
| 2. When I produce an oral or written message in the target language, I make sure that all the grammatical structures are in agreement with each other. | 0 | 1 | 2 | 3 | 4 |
| 3. I not only attend to grammar but check for appropriate levels of formality and politeness. | 0 | 1 | 2 | 3 | 4 |

A - Total _____

- | | | | | | |
|--|---|---|---|---|---|
| 4. When speaking or writing, I feel that focusing on grammar is less important than paying attention to the content of the message. | 0 | 1 | 2 | 3 | 4 |
| 5. It is a challenge for me to both focus on communication in speech or writing while at the same time paying attention to grammatical agreement (e.g., person, number, tense, or gender). | 0 | 1 | 2 | 3 | 4 |
| 6. When I am using lengthy sentences in a target language, I get distracted and neglect aspects of grammar and style. | 0 | 1 | 2 | 3 | 4 |

B - Total _____

APPENDIX C: LEARNING STYLE SURVEY (TURKISH VERSION),
INFORMED CONSENT FORM

GÖNÜLLÜ KATILIM

Bu çalışma, Ankara Üniversitesi'nde İngilizce okutmanı olarak çalışan ve Bilkent Üniversitesi'nde yüksek lisans yapmakta olan Hakan Cangır tarafından yürütülmektedir. Çalışmanın amacı, öğrencilerin öğrenme stilleri ile internet yoluyla desteklenen bir dersteki başarıları arasındaki olası ilişkiyi saptamaktır. Çalışmada aynı zamanda, bilgisayar destekli dil öğrenim ek materyallerinin, öğrencilerin sınıftaki başarılarını ölçen test performanslarındaki etkisi de incelenecektir. Son olarak, uygulanmakta olan deneysel çalışma süresince öğrencilerin öğrenme stillerine bağlı olarak ortaya çıkabilecek çevrimiçi sınıflardan yararlanma farklılıkları tespit edilmeye çalışılacaktır. Çalışmaya katıldığınız için şimdiden teşekkür ederiz. Çalışma hakkında daha fazla bilgi almak için Hakan Cangır (E-posta: hcangir@bilkent.edu.tr) ile iletişim kurabilirsiniz.

H. CANGIR

Bu çalışmaya tamamen gönüllü olarak katılıyorum ve istediğim zaman yarıda kesip çıkabileceğimi biliyorum. Verdiğim bilgilerin bilimsel amaçlı yayımlarda kullanılmasını kabul ediyorum. (Formu doldurup imzaladıktan sonra uygulayıcıya geri veriniz).

İsim Soyad

Tarih ----/----/-----

İmza

ÖĞRENME TARZI ANKETİ

Öğrenme Tarzı Anketi, öğrenmeye olan yaklaşımınızı değerlendirmek için tasarlanmıştır. Anket, her farklı durum için davranışlarınızı ölçmez; fakat genel öğrenme tarzı tercihinizin açık bir göstergesidir. Ankette verilen her madde için öğrenme yaklaşımınıza en uygun olan sadece bir seçeneği işaretleyin. Ankette yer alan tüm soruları cevaplamaya çalışın. Ankette, öğrenme stilinizin farklı özelliklerini temsil eden altı adet ana bölüm bulunmaktadır. İfadeleri okuduğumuzda, öğrenirken genelde ne yaptığınızı düşünmeye çalışın. Anket yaklaşık 30 dakika sürmektedir. Her hangi bir soru üzerine çok fazla vakit harcamayın; o andaki düşüncenizi işaretleyip diğer soruya geçin.

Ad:

Bölüm:

Sizin için en doğru olan seçeneği işaretleyin.

0= asla

1= nadiren

2= bazen

3=sık sık

4=her zaman

I.

- | | | | | | |
|---|---|---|---|---|---|
| 1. Herhangi bir şeyi yazarsam daha iyi hatırlarım. | 0 | 1 | 2 | 3 | 4 |
| 2. Dersler sırasında detaylı not alırım. | 0 | 1 | 2 | 3 | 4 |
| 3. Dinlediğimde; objeleri, sayıları ve kelimeleri zihnimde canlandırabilirim. | 0 | 1 | 2 | 3 | 4 |
| 4. Televizyon veya diğer görsel gereçlerle öğrenmeyi tercih ederim. | 0 | 1 | 2 | 3 | 4 |
| 5. Öğrenirken ve çalışırken, anlamama yardımcı olması için renklendirme yöntemini kullanırım. | 0 | 1 | 2 | 3 | 4 |
| 6. Derslerde hocanın verdiği görevleri anlamak için yazılı bilgilendirmeye ihtiyaç duyarım. | 0 | 1 | 2 | 3 | 4 |
| 7. İnsanların ne dediğini anlamak için konuşurken onlara bakmam gerekir. | 0 | 1 | 2 | 3 | 4 |
| 8. Hoca tahtayı kullanarak ders anlattığında daha iyi anlarım. | 0 | 1 | 2 | 3 | 4 |
| 9. Tablolar, diyagramlar ve haritalar konuyu anlamama yardımcı olur. | 0 | 1 | 2 | 3 | 4 |
| 10. İnsanların yüzlerini hatırlarım; fakat isimlerini hatırlayamam. | 0 | 1 | 2 | 3 | 4 |

A - _____

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|---|---|---|---|---|---|
| 11. Herhangi bir konuyu biriyle tartıştığımda daha iyi hatırlarım. | 0 | 1 | 2 | 3 | 4 |
| 12. Konuyu okumaktansa dinlemeyi tercih ederim. | 0 | 1 | 2 | 3 | 4 |
| 13. Derslerde hocanın verdiği görevleri anlamam için sözel bilgilendirmeye ihtiyaç duyarım. | 0 | 1 | 2 | 3 | 4 |
| 14. Çalışma ortamında var olan sesler, düşünmeme yardımcı olur. | 0 | 1 | 2 | 3 | 4 |
| 15. Çalışırken müzik dinlemeyi severim. | 0 | 1 | 2 | 3 | 4 |
| 16. Onları göremesem bile insanların söylediklerini anlayabilirim. | 0 | 1 | 2 | 3 | 4 |
| 17. İnsanların isimlerini hatırlayabilirim; ama yüzlerini hatırlayamam. | 0 | 1 | 2 | 3 | 4 |
| 18. Duyduğum fıkraları kolaylıkla hatırlarım. | 0 | 1 | 2 | 3 | 4 |
| 19. İnsanları sesinden tanımlayabilirim(ör: telefonda). | 0 | 1 | 2 | 3 | 4 |
| 20. Televizyonu açıkken; ekrana bakmaktan çok sesi dinlerim. | 0 | 1 | 2 | 3 | 4 |

B - _____

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|---|---|---|---|---|---|
| 21. İşe, talimatları kontrol etmeden önce başlamayı tercih ederim. | 0 | 1 | 2 | 3 | 4 |
| 22. Çalışırken sık sık ara vermem gerekir. | 0 | 1 | 2 | 3 | 4 |
| 23. Okurken veya ders çalışırken bir şeyler yeme ihtiyacı hissederim. | 0 | 1 | 2 | 3 | 4 |
| 24. Oturmakla ayakta durmak arasında seçim yapacak olsam, ayakta kalırım. | 0 | 1 | 2 | 3 | 4 |
| 25. Uzun süre olduğum yerde oturursam gerilirim. | 0 | 1 | 2 | 3 | 4 |
| 26. Dolaşarak daha iyi düşünürüm. | 0 | 1 | 2 | 3 | 4 |
| 27. Ders sırasında kalemimle oynarım veya onu ısırırım. | 0 | 1 | 2 | 3 | 4 |
| 28. Objeleri hareket ettirmek, söylenenleri hatırlamama yardımcı olur. | 0 | 1 | 2 | 3 | 4 |
| 29. Konuşurken ellerimi hareket ettiririm. | 0 | 1 | 2 | 3 | 4 |
| 30. Ders esnasında defterime bir sürü resim çizerim. | 0 | 1 | 2 | 3 | 4 |

C - _____

II.

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|--|---|---|---|---|---|
| 1. Başkalarıyla çalışırsam kendi başıma çalıştığımdaya daha iyi öğrenirim. | 0 | 1 | 2 | 3 | 4 |
| 2. Sohbeta katılarak yeni insanlarla kolayca tanışırım. | 0 | 1 | 2 | 3 | 4 |
| 3. Okuldaki derste, özel derstekinden daha iyi öğrenirim. | 0 | 1 | 2 | 3 | 4 |
| 4. Yabancılara yaklaşmak benim için kolaydır. | 0 | 1 | 2 | 3 | 4 |
| 5. Birçok kişiyle etkileşimde bulunmak bana enerji verir. | 0 | 1 | 2 | 3 | 4 |
| 6. Olayları önce deneyim edinip daha sonra anlamaya çalışmayı tercih ederim. | 0 | 1 | 2 | 3 | 4 |

A - _____

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|---|---|---|---|---|---|
| 7. Kendi düşüncelerime göre hareket ederim. | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|

8. Bireysel veya bire bir oyun ve aktiviteleri tercih ederim. 0 1 2 3 4
9. Birkaç ilgi alanım var ve onlara yoğun bir şekilde odaklanıyorum. 0 1 2 3 4
10. Büyük bir grup içerisinde çalıştıktan sonra kendimi bitkin hissedirim. 0 1 2 3 4
11. Büyük bir grup içerisindeyken, genelde sessiz kalıp sadece dinlerim. 0 1 2 3 4
12. Bir şeyi denemeden önce onu anlamayı isterim. 0 1 2 3 4
- B - _____
- III.
1. Yaratıcı bir hayal gücüm var. 0 1 2 3 4
2. Bir şeyin neden olduğuyla ilgili bir çok seçenek ve olasılık bulmaya çalışırım. 0 1 2 3 4
3. Gelecekteki olaylar için dikkatlice plan yaparım. 0 1 2 3 4
4. Bir şeyin bana açıklanmasındansa onu kendim keşfetmeyi tercih ederim. 0 1 2 3 4
5. Sınıf içi tartışmalarda birçok özgün fikir sunarım. 0 1 2 3 4
6. Arkadaşımdan gelecek yeni önerilere açığım. 0 1 2 3 4
- A - _____
7. Bir duruma, nasıl olabileceğini düşünmek yerine olduğu gibi odaklanırım. 0 1 2 3 4
8. Bir aleti kullanmadan önce aletin kullanım kılavuzunu okurum. 0 1 2 3 4
9. Yeni, test edilmemiş fikirler yerine somut gerçekleri tercih ederim. 0 1 2 3 4
10. Bir şeyin aşama aşama sunulmasını tercih ederim. 0 1 2 3 4
11. Eğer sınıf arkadaşlarım ortak yapılan bir projenin planını değiştirirlerse bu durum beni rahatsız eder. 0 1 2 3 4
12. Talimatları dikkatlice takip ederim. 0 1 2 3 4
- B - _____
- IV.
1. Dil öğrenimimi dikkatlice planlamak, dersleri zamanında veya erken yapmak hoşuma gider. 0 1 2 3 4
2. Derste tuttuğum notlar ve okul malzemelerim dikkatlice düzenlenmiştir. 0 1 2 3 4
3. Öğrendiğim dildeki her şeyin ne anlama geldiğini bilmek isterim . 0 1 2 3 4
4. Öğrendiğim dilde hangi kuralların neden uygulandığını bilmek hoşuma gider. 0 1 2 3 4
- A - _____
5. Eğer başka şeylerle meşgulsem yapılması gereken bir işi erteleyebilirim. 0 1 2 3 4
6. Sonradan organize edilmek üzere masamda işler birikir. 0 1 2 3 4
7. Bir konuyla ilgili her şeyi anlamayı çok dert etmem. 0 1 2 3 4
8. Bence bir konuyla ilgili sonuçlara hızlı varmak gereksizdir. 0 1 2 3 4
- B - _____
- V.
1. Bir dili öğrenirken genel örneklerden özel örneklere geçmek hoşuma gider. 0 1 2 3 4
2. Örneklerin yerine kurallar ve teorilerle başlamayı tercih ederim. 0 1 2 3 4
3. Genellemelerle başlayıp daha sonra bu genellemelerle ilişkili örnekler bulmak hoşuma gider 0 1 2 3 4
- A - _____
4. Öğrendiğim dilin kurallarını dolaylı yoldan, gramer yapıları ve diğer dil özelliklerinin örnekleri üzerinden öğrenmek hoşuma gider. 0 1 2 3 4
5. Dil öğrenirken kuralların söylenmesini umursamam çünkü zaten bu kuralları daha sonra tam olarak hatırlamam. 0 1 2 3 4
6. Öğrendiğim dilin kurallarını çeşitli yerlerde karşıma çıktıkça keşfederim. 0 1 2 3 4
- B - _____
- VI.
1. İçinde çeldirici bilgi bulunduğu bile, verilen bağlamdaki önemli ve ilişkili bilgiyi ayırabilirim. 0 1 2 3 4
2. Öğrendiğim dilde yazılı ya da sözlü bir mesaj ilettiğimde, kurduğum cümlelerdeki gramer kurallarına dikkat ederim. 0 1 2 3 4
3. Yalnızca gramerime değil aynı zamanda konuşmanın resmiyetine de dikkat ederim. 0 1 2 3 4
- A - _____
4. Yazarken veya konuşurken, gramere odaklanmak mesajın içeriğine odaklanmaktan; bence daha az önemlidir. 0 1 2 3 4
5. Konuşurken veya yazarken, aynı anda hem mesajın içeriğine hem de gramere odaklanmak benim için zordur. 0 1 2 3 4

6. Öğrendiğim dilde uzun cümleler kurarken, dikkatim dağılır ve gramer kurallarını ihlal ederim.

0 1 2 3 4
B - _____

APPENDIX D: CALL FEATURES QUESTIONNAIRE

(ENGLISH VERSION)

Learning Style Questionnaire II

Name - Surname:

Department:

This questionnaire was designed to explore the possible differences in students' level of benefitting from the online program due to their various learning styles during the research. Please, read each item carefully mark the box which is the best option for you.

Absolutely disagree	Disagree	Not sure	Agree	Absolutely agree
1	2	3	4	5

1. I found the pictures, videos etc in the program useful.	1	2	3	4	5
2. I found the auditory materials in the program useful.	1	2	3	4	5
3. I enjoyed the exercises which required using a mouse (eg: drag-and-drop)	1	2	3	4	5
4. I enjoyed working with my classmates in the laboratories.	1	2	3	4	5
5. I enjoyed working independently with the program.	1	2	3	4	5
6. I didn't worry about the unit order in the program while doing the activities and jumped around the modules.	1	2	3	4	5
7. I paid attention to the unit and activity order in the program.	1	2	3	4	5
8. I paid close attention to language rules and instructions provided in the program	1	2	3	4	5
9. I finished the writing assignments set via the online program on time.	1	2	3	4	5
10. I liked the explicit instructions in the program.	1	2	3	4	5
11. I preferred discovering the rules of the language in the program.	1	2	3	4	5
12. I didn't care finishing the writing assignments set via the online program on time.	1	2	3	4	5
13. I preferred to the grammar sections in the program first.	1	2	3	4	5
14. I preferred doing the reading and listening sections in the program first before I practice grammar.	1	2	3	4	5

15. While using the program I had no problem concentrating amid noise and confusion.	1	2	3	4	5
16. While using the program I enjoyed analyzing grammar structures	1	2	3	4	5
17. While using the program I felt I had to understand every word of what I read or hear.	1	2	3	4	5
18. While using the program either in the lab or at home, I preferred to work alone.	1	2	3	4	5
19. After I finished the modules, Receiving feedback from my teacher really didn't affect my learning at all.	1	2	3	4	5
20. While using the program, I needed a quiet environment in order to concentrate well.	1	2	3	4	5
21. While using the program, I found grammar analysis tedious and boring.	1	2	3	4	5
22. While using the program, I didn't mind reading or listening in the L2 without understanding every single word as long as I 'catch' the main idea.	1	2	3	4	5
23. While using the program in the lab, I really enjoyed working with other people in pairs or groups.	1	2	3	4	5
24. After I finished the modules, I found the feedback given by my teacher useful as a means of understanding my problem areas.	1	2	3	4	5

APPENDIX E: CALL FEATURES QUESTIONNAIRE

(TURKISH VERSION)

ÖĞRENME STİLLERİ ANKETİ(ek)

Ad – Soyad:

Bölüm:

Bu anket, uygulanmakta olan deneysel çalışma süresince öğrenme stillerinize bağlı olarak ortaya çıkabilecek çevrimiçi sınıflardan yararlanma farklılıklarını ölçmek için tasarlanmıştır. Anket boyunca verilen her bir maddeyi dikkatlice okuyunuz ve size göre doğru olan kutucuğu işaretleyiniz.

Kesinlikle Katılmıyorum	Katılmıyorum	Emin Değilim	Katılıyorum	Kesinlikle Katılıyorum
1	2	3	4	5

1.Programda yer alan görsel materyalleri (resim, video vs.) yararlı buldum.	1	2	3	4	5
2.Programda yer alan işitsel materyalleri yararlı buldum.	1	2	3	4	5
3.Programı kullanırken, fare hareket ettirerek yapılan egzersizlerden keyif aldım (ör: sürükle ve bırak eg.).	1	2	3	4	5
4.Laboratuarda programı kullanırken diğer öğrencilerle çalışmaktan keyif aldım.	1	2	3	4	5
5.Programı tek başıma kullanıyor olmaktan keyif aldım.	1	2	3	4	5
6.Programı kullanırken ünite sırasına dikkat etmedim; bir aktiviteden başka bir aktiviteye sırasını gözetmeksizin geçtim.	1	2	3	4	5
7.Programı kullanırken ünite sırasına dikkat ettim; bir aktiviteden başka bir aktiviteye sırayla geçtim.	1	2	3	4	5
8.Programı kullanırken, verilen dil kurallarına ve açıklamalara dikkat ettim.	1	2	3	4	5
9.Program üzerinden verilen yazı ödevlerini zamanında bitirdim.	1	2	3	4	5
10.Programda yer alan detaylı açıklamalar hoşuma gitti.	1	2	3	4	5
11.Programı kullanırken, gramer egzersizlerini kurallara ve açıklamalara bakmadan yaptım.	1	2	3	4	5
12.Program üzerinden verilen yazı ödevlerini zamanında bitirmeyi dert etmedim.	1	2	3	4	5

13.Programı kullanırken, ilk önce genellikle gramer bölümlerini yapmayı tercih ettim.	1	2	3	4	5
14.Programı kullanırken, gramer bölümlerinden önce dinleme ve okuma bölümlerini yapmayı tercih ettim.	1	2	3	4	5
15.Programı kullanırken, odaklanma problemi yaşamadım.	1	2	3	4	5
16.Programı kullanırken, gramer yapılarını incelemekten zevk aldım.	1	2	3	4	5
17.Programı kullanırken, duyduğum ve okuduğum her kelimeyi bilmek zorunda hissettim.	1	2	3	4	5
18.Laboratuvar veya evde programı kullanırken, yalnız başıma çalışmayı tercih ettim.	1	2	3	4	5
19.Tüm modülleri bitirdikten sonra öğretmenimden dönüt almam, programı kullanma şeklimi değiştirmedim.	1	2	3	4	5
20.Programı kullanırken, iyi konsantre olabilmek için sessiz bir ortama ihtiyaç duydum.	1	2	3	4	5
21.Programı kullanırken, gramer incelemelerini sıkıcı buldum.	1	2	3	4	5
22.Programı kullanırken, ana düşünceyi yakaladığım sürece bütün kelimeleri anlamadan okumayı ve dinlemeyi önemsemedim.	1	2	3	4	5
23.Programı laboratuvarında kullanırken, diğer arkadaşlarımla çiftli ya da grup halinde çalışmaktan zevk aldım.	1	2	3	4	5
24.Tüm modülleri bitirdikten sonra öğretmenimden aldığım dönütü, öğrenmenin tamamlanmadığı alanları anlamama ve odaklanmama yardım etmesi açısından faydalı buldum.	1	2	3	4	5