



T.C. YEDITEPE UNIVERSITY

GRADUATE SCHOOL OF EDUCATIONAL SCIENCES

MASTER'S PROGRAM IN ENGLISH LANGUAGE EDUCATION

EXAMINING THE RELATIONSHIPS AMONG 11TH GRADE ENGLISH AS A
FOREIGN LANGUAGE (EFL) LEARNERS' VOCATIONAL PROGRAMS, COGNITIVE
STYLES AND LEARNING STYLE PREFERENCES

TUĞÇE AYDIN BAĞIŞ

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M.A. THESIS

PROGRAM IN ENGLISH LANGUAGE EDUCATION

YEDITEPE UNIVERSITY

JULY, 2021



**YEDİTEPE UNIVERSITY
GRADUATE SCHOOL OF EDUCATIONAL SCIENCES DIRECTORATE**

THESIS SUBMISSION and APPROVAL FORM

TITLE: Examining the Relationships among 11th Grade English as a Foreign Language (EFL) Learners' Vocational Programs, Cognitive Styles and Learning Style Preferences

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DATE OF THESIS DEFENSE : 01.07.2021
DATE OF THESIS APPROVAL : 01.07.2021

Abstract

The current study aimed to explore (1a) Field Dependence-Independence (FDI) cognitive style of 11th grade English as a Foreign Language (EFL) learners studying at chemical technologies and child development-education programs in a Vocational and Technical Anatolian High School in Istanbul, (1b) the relation between their cognitive styles and their choice of vocational programs; (2a) the deductive-inductive learning style preferences of field dependent and field independent learners in both programs, (2b) the relation between their preferences of deductive-inductive learning styles and the vocational programs; and (3) the relation between their FDI cognitive style and learning style preferences. To achieve these purposes, 169 participants were administered the Group Embedded Figures Test (GEFT) and the Learning Style Survey (LSS) in Turkish language version. To analyze the data, descriptive statistics, the chi-square test and the phi correlation coefficient (ϕ) were used. The results revealed that the students at chemical technologies program were significantly more field independent whereas the students studying at child development-education program were significantly more field dependent. In total, the learners were found to be predominantly field dependent. In terms of learning style preferences, in chemical technologies program, field independent learners mainly preferred deductive way of learning while field dependent learners mainly preferred inductive learning style. In child development-education program, both the field dependent and the field independent learners mainly preferred inductive learning. In total, inductive learning was more preferred style. The study revealed a significant relation between FDI cognitive style and the vocational programs but not between the learning style preferences and the vocational programs. The study also revealed a significant relation between the learners' cognitive styles and learning style preferences. The findings of the study can inspire curriculum developers and language teachers to rearrange the curriculums/lessons plans on the basis of

the EFL learners' cognitive styles and learning style preferences, and researchers to conduct more studies for an in-depth exploration of other cognitive styles as well. In this regard, the present study may even be the one that pioneers new studies in the fields of vocational education and EFL.

Keywords: Cognitive style, field dependent learners, field independent learners, learning style, deductive learning, inductive learning, chemical technologies program, child development-education program



Özet

Bu çalışma, (1a) İstanbul'da bir Mesleki ve Teknik Anadolu Lisesinde kimya teknolojileri ve çocuk gelişimi-eğitimi alanlarında İngilizceyi yabancı dil olarak öğrenen 11. sınıf öğrencilerinin alan bağımlılık-bağımsızlık bilişsel stilini, (1b) bu öğrencilerin bilişsel stilleri ve mesleki programları tercihleri arasındaki ilişkiyi; (2a) her iki alandaki alan bağımlı ve alan bağımsız öğrencilerin tümdengelim-tümevarım öğrenme stili tercihlerini, (2b) bu öğrencilerin tümdengelim-tümevarım öğrenme stili tercihleri ve mesleki programları arasındaki ilişkiyi; ve (3) onların alan bağımlılık-bağımsızlık bilişsel stili ve öğrenme stili tercihleri arasındaki ilişkiyi araştırmayı amaçlamıştır. Bu amaçları gerçekleştirmek için 169 katılımcıya Türkçe versiyondaki Saklı Şekiller Grup Testi ve Öğrenme Stilleri Anketi uygulanmıştır. Verileri analiz etmek için tanımlayıcı istatistikler, ki-kare testi ve dörtlü (ϕ) korelasyon katsayısı kullanılmıştır. Sonuçlar, kimya teknolojileri alanında öğrenim gören öğrencilerin anlamlı ölçüde daha çok alan bağımsızken çocuk gelişimi-eğitimi alanında öğrenim gören öğrencilerin anlamlı ölçüde daha çok alan bağımlı olduklarını ortaya çıkarmıştır. Toplamda, öğrencilerin ağırlıklı olarak alan bağımlı oldukları bulunmuştur. Öğrenme stili tercihleri açısından, kimya teknolojileri alanında, alan bağımlı öğrenciler daha çok tümevarım öğrenme stilini tercih ederken alan bağımsız öğrenciler daha çok tümdengelim öğrenme stilini tercih etmiştir. Çocuk gelişimi-eğitimi alanında, hem alan bağımlı hem de alan bağımsız öğrenciler çoğunlukla tümevarım öğrenmeyi tercih etmişlerdir. Bütünüyle, tümevarım öğrenme daha çok tercih edilen stil olmuştur. Çalışma, öğrenme stili tercihleri ve mesleki alanlar arasında değil ama alan bağımlılık-bağımsızlık bilişsel stili ve mesleki alanlar arasında anlamlı bir ilişki ortaya çıkarmıştır. Çalışma, öğrencilerin bilişsel stilleri ve öğrenme stili tercihleri arasında da anlamlı bir ilişki ortaya çıkarmıştır. Çalışmanın bulguları, müfredat programı geliştiricilerine ve dil öğretmenlerine, müfredat programlarını/ders planlarını İngilizceyi yabancı dil olarak öğrenen öğrencilerin bilişsel

stilleri ve öğrenme stili tercihlerine dayanarak yeniden düzenlemek, ve arařtırmacılara, diđer bilişsel stillerin de derinlemesine incelenmesi amacıyla, daha fazla çalıřma yapmak için ilham verebilir. Bu bakımdan, bu çalıřma, mesleki eđitim ve yabancı dil olarak İngilizce alanlarında yeni çalıřmalara öncülük eden bir çalıřma bile olabilir.

Anahtar kelimeler: Bilişsel stil, alan bađımlı öğrenciler, alan bađımsız öğrenciler, öğrenme stili, tümdengelim öğrenme, tümevarım öğrenme, kimya teknolojileri alanı, çocuk gelişimi-eđitimi alanı





*To
my loving grandparents, parents, sister,
my dear husband,
and my beloved daughters Derin and Sezin*

*For their encouragement, guidance, support all the way,
and their constant love...*

Acknowledgements

I would like to use this opportunity to express my deepest gratitude to the people who provided me robust support throughout my graduate studies and have been of tremendous importance in my life.

To begin with, I would like to thank my advisor Dr. Evrim Eveyik-Aydın for her invaluable feedback and recommendations on the present study. Her support, guidance and patience along with her effort to provide valuable knowledge whenever I needed took this study one step further, which, in turn led me to achieve my master's thesis.

I would also like to thank Dr. Zeynep Koçođlu and Dr. Kaine Gülözer for their remarkable opinion they expressed on this study being the committee members. Their views undoubtedly provided significant insight into the study.

Additionally, I am very grateful to the enormous encouragement my parents, Hatice Aydın and Ali Aydın, and my sister, Dr. Tutku Aydın, have given me. They have always believed in me that I can overcome the difficulties and eventually succeed. I am really thankful that they have fully supported me in every aspect of my life, which has motivated me to do my best.

Lastly, I owe my dear husband, Serdar Bađıř, and my beloved daughters, Derin Bađıř and Sezin Bađıř, a great debt of thanks for their encouragement, support and, in particular, patience. In fact, there are no words that can show my appreciation. They have always motivated me. They very patiently waited for me while I was so busy with my graduate studies. I could not have completed this study without their endless love and understanding. So, thank you my dear husband for your sacrifices and thank you Derin and Sezin for your great patience and love. To make this a success, you also did your best. In the end, we achieved it together.

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List of Abbreviations

| | |
|------|--|
| CEFR | The Common European Framework of Reference |
| CSA | Cognitive Style Analysis |
| EFL | English as a Foreign Language |
| ESL | English as a Second Language |
| FDI | Field Dependence-Independence |
| GEFT | Group Embedded Figures Test |
| LSS | Learning Style Survey |
| MoNE | Ministry of National Education |
| SLA | Second Language Acquisition |
| SLL | Second Language Learning |
| TEOG | Temel Eğitimden Ortaöğretime Geçiş |

CHAPTER I

INTRODUCTION

1.1. Background to the Study

Language is the most important means of communication and interaction among people throughout the world. Due to such a significance of language, it continues to be of interest, especially in studies investigating how a second language is learned after mother tongue has been acquired (Ortega, 2013).

According to Kiruthika (2016) and Leech and Svartvik (2013), in order to learn a second language, it is important to learn the grammar of the target language at first. Besides, it is crucial to know the meanings of the structures in grammar (Leech & Svartvik, 2013). Thus, it is not surprising that the interest in second language learning (SLL) has inspired researchers to investigate the appropriate ways of teaching second language grammar (Ellis, 2006; Herron & Tomasello, 1992; Scott, 1990).

For decades, language teachers, researchers and the curriculum developers have discussed the effective ways to teach grammar (Burgess & Etherington, 2002; Dekeyser, 1994; Fischer, 1979; Hammerly, 1975; Long, 1983; Ortega, 2013; Scott, 1990). In particular, choosing the appropriate grammar instruction, i.e., deductive or inductive, has become a major issue for the majority of the language teachers (Krashen & Seliger, 1975; Nešić & Hamidović, 2015; Ortega, 2013).

In fact, both instructions can be regarded as an explicit way of teaching (Jean & Simard, 2013; Scott, 1990) known as a teaching approach in which teachers or the learners study on the rules or the structural forms with the help of various examples at the very beginning or at the end of the teaching process (Dekeyser, 1994; Ellis, 1998; Scott, 1990). Implicit way of teaching, on the other hand, can be considered a teaching approach that

enables learners to acquire the target structures given in contexts without emphasizing the grammar rules (Dekeyser, 1994; Scott, 1990).

In light of these facts, it is significant to consider the deductive and inductive instructions in relation with the explicit or implicit instruction. As Dekeyser (1994) states, deductive way of teaching is generally attributed to learning explicitly which, in turn, leads to explicit deductive learning. In this regard, traditional teaching is found to be related with deductive instruction (Hammerly, 1975; Krashen & Seliger, 1975). On the contrary, in a learning context in which the learners are required to study and infer the rules, the combinations of terms are formed as explicit inductive learning (Dekeyser, 1994). From this perspective, as Ellis (1998) points out, it is important to present the appropriate explicit instruction to learners who are required to directly learn the rules or play an active role to discover them.

A second language can be acquired through learning the grammar and the meanings of the target language's structures (Kiruthika, 2016; Leech & Svartvik, 2013). However, whether providing the appropriate grammar instruction to achieve this would be enough is, of course, debatable. If language is considered a whole, the parts of it should not be ignored since each part may affect one another. In this sense, in order to regard a teaching approach as effective, various learner characteristics should be taken into account due to the fact that individual differences such as age, aptitude, motivation in learning, learning styles and preference in language learning either with presentations or discovery of the target language (Richards & Reppen, 2014) affect the ways in which language learning takes place (Nešić & Hamidović, 2015).

For instance, learning style preference is an important factor in SLL. Learning style can be regarded as a concept that is related to how an individual perceives the information and codes it in mind considering their experiences, the environmental factor and inheritance

(Cesur & Fer, 2009). As for the learning style preference, it generally refers to the tendency to eagerly perceive and code the information which, in turn, supports a better achievement (Claxton & Murrell, 1987). As Claxton and Murrell (1987) point out, it is necessary to take the learning styles into consideration in relation with the preference for a specific instructional technique. From this perspective, since deductive and inductive grammar instructions have been extensively studied by the language teachers (Krashen & Seliger, 1975; Ortega, 2013), it is worth linking deductive and inductive instructions to learning style preferences as well.

In addition to the learning style preferences, personality traits such as extroversion which can be considered being in favor of sociability and introversion which is generally regarded as being interested in personal activities without an association with other people (Ortega, 2013) influence the students' perception of the target knowledge despite the same instruction (Moody, 1988), and, of course, cognitive styles are also kept in mind as an effective factor in language learning (Hoffman, 1997; Ortega, 2013; Skehan, 1991).

Cognitive styles, known also as personality traits, are thought to be one of the important personal characteristics influencing an individual's comprehending, analyzing, inferring the meaning and mentally processing information in an effort to learn (Alptekin & Atakan, 1990; Hansen, 1984; Hansen & Stansfield, 1981; Hansen & Stansfield, 1982; Hoffman, 1997; Ortega, 2013; Witkin et al., 1977). As Ortega (2013) states, there are various types of cognitive styles such as *holistic-analytic*, *reflective-impulsive* and *field dependent-field independent*. *Holistic-analytic* can be defined as paying attention to the whole part and specific details, respectively. *Reflective-impulsive* cognitive styles are regarded as the rate of mental activity to process data, i.e., *reflective* one leads to a slower process to be more cautious in learning while *impulsive* cognitive style leads to a quick data process (Cohen & Weaver, 2005). Among these cognitive styles, although the field dependence-independence

(FDI) cognitive style originally comes from the field of psychology, it has been extensively studied, in particular, in the field of second language acquisition (SLA) as stated by Jamieson (1992) and Tinajero et al. (2011) (e.g., Evans et al., 2013; Hansen & Stansfield, 1981; Hansen & Stansfield, 1982; Hoffman, 1997; Meguro, 2020; Ortega, 2013; Pithers, 2002; Witkin et al., 1977; Xu, 2011) since FDI is considered an important factor affecting SLL (Hansen & Stansfield, 1981; Hoffman, 1997; Ortega, 2013; Wang, 2012; Xu, 2011).

The cognitive level of field dependence is more related to global way of mental information processing (Alptekin & Atakan, 1990; Hoffman, 1997). Field dependent learners perceive something as a whole to get the key points rather than analyzing the specific parts (Xu, 2011). They are better at building social relationship; thus communicating easily with people when compared to the field independent ones (Hansen, 1984; Skehan, 1991).

The cognitive level of field independence is mainly associated with analytical way of mental information processing. Field independent learners, known also as analytic learners, can easily analyze or rearrange the parts or items within a whole. This mental ability enables these learners to notice the structural items of the language and perceive the parts of the sentences/contexts (Alptekin & Atakan, 1990; Carter, 1988; Hoffman, 1997; Skehan, 1991, Xu, 2011).

Therefore, as acknowledged often in the literature (e.g., Claxton & Murrell, 1987; Hoffman, 1997; Pithers, 2002; Witkin et al., 1977), these cognitive styles even play a significant role in choosing a profession or program. For instance, while field dependent learners mostly deal with human relations, education and social science, field independent learners tend to study mathematics and science. Considering these facts, to gain a deeper insight into SLL, the factors that may affect language learning such as FDI cognitive style should be taken into account in relation with the preference for deductive and inductive learning styles and even with the programs at which the learners study.

1.2. Statement of the Problem

Secondary education in Turkey provides learners with different school types such as state schools and private schools. Learners who want to study at a state school encounter various kinds of high schools such as Science, Social Sciences, Anatolian, Fine Arts, Sports, Anatolian Iman-Hatip, Multi-program Anatolian and Vocational and Technical Anatolian (Braine, 2005; Büyükgöze-Kavas et al., 2015).

Vocational and technical schools mainly offer vocation-specific courses. Thus, the students gain theoretical and practical knowledge on a specific vocation, which, in turn, plays a significant role in their future career (Akşit, 2007; Schaap et al., 2012; Şimşek & Yıldırım, 2000). In these schools, the students attend either one of the vocational and technical programs such as chemical technologies, child development-education, information technologies, fashion design technologies, electrical and electronics technologies, and beauty-hair care.

Until the fall semester of 2020-2021 academic year, students' selection of these vocational programs was mainly based on the grades they obtained at the end of 9th grade. Thus, they started to study the vocation-specific courses in the programs like chemical technologies and child development-education when they were 10th graders. However, since the fall of 2020, due to the changes in the education system, vocational programs have started at 9th grade. So, it is crucial to note that at the time of the data collection for the present study, the 9th graders were studying at common program which offered courses like Turkish literature, history, geography, mathematics, physics, biology, chemistry, religious culture and moral knowledge, physical education, and foreign language excluding vocation-specific courses whereas 10th, 11th and 12th graders were studying at vocational programs.

In light of these facts, the vocational programs can be concluded to have a robust impact on the students' future career. However, students are not administered any tests to

reveal their cognitive and learning styles along with learning style preferences. Learners' cognitive styles and learning style preferences may, in fact, influence their vocational choices. As Hoffman (1997), Pithers (2002) and Witkin et al. (1977) note, cognitive styles, especially FDI, are important factors in deciding on a profession. To further explain, Hansen and Stansfield (1982) and Witkin et al. (1977) state that field dependent learners tend to deal with sociology, education and teaching at an elementary school whereas field independent learners are more likely to study science, mathematics, engineering and architecture. Apart from these, Hoffman (1997) puts emphasis on investigating the role of cognitive style of FDI in academic and vocational choices in foreign language learning. Therefore, it is crucial to conduct research examining the relationships among the cognitive styles, learning style preferences of the students and the vocational programs they attend.

Of course, to date, a considerable amount of research has been conducted on cognitive styles, learning styles and learning style preferences. For example, some studies examined the impact of FDI on second language achievement (Abraham, 1985; Alptekin & Atakan, 1990; Carter, 1988; Hansen, 1984; Hansen & Stansfield, 1981; Hansen & Stansfield, 1982; Jamieson, 1992; Johnson et al., 2000; Meguro, 2020; Wang, 2012). The researchers were also interested in exploring the effects of deductive and inductive instructions on students' achievement in long and short terms (Erlam, 2003; Haight et al., 2007; Herron & Tomasello, 1992; Lee & Lin, 2019; Takimoto, 2008; Tammenga-Helmantel et al., 2014; Vogel et al., 2011); on students' ability and preferences in learning (Jean & Simard, 2013; Shaffer, 1989); and on the learners' aptitude (Hwu et al., 2014). It can be noted that while some researchers find the inductive instruction more effective than the deductive instruction to teach grammar to language learners (Haight et al., 2007; Herron & Tomasello, 1992; Takimoto, 2008; Vogel et al., 2011), others regard the deductive approach as a preferable one for language learners with a low level of language aptitude and find the deductive instruction more efficient for

field independent learners (Abraham, 1985; Hwu et al., 2014), also known as analytic ones who focus on the details in order to detect the specific parts within a whole context in a problem-solving manner (Alptekin & Atakan, 1990; Carter, 1988; Hoffman, 1997). Besides, some researchers state that there is not a significant difference between the impacts of both instructions on SLL in terms of students' achievement scores (Hwu et al., 2014; Jean & Simard, 2013; Lee & Lin, 2019; Shaffer, 1989; Tammenga-Helmantel et al., 2014).

Abraham (1985) and Wang (2012) conducted their research in English as a second language (ESL) and English as a foreign language (EFL) contexts, respectively, to find whether FDI affects deductive and inductive ways of teaching. Their studies revealed contradictory findings. Abraham (1985) found that field independent learners performed better at grammar test with the help of deductive instruction. Wang (2012), however, detected that field dependent learners in deductive and inductive groups were more successful in grammar test when compared to the field independent students. In Turkish EFL context, Behçetoğulları (1992) conducted her study with Turkish EFL learners to explore the interaction between these instructions and cognitive styles. As the findings of her study, field independent learners were found to achieve better when taught deductively and inductively.

While the effect of deductive and inductive instructions on language learning has been extensively studied, students' preference for either learning styles has not been explored enough. Besides, although the cognitive style of FDI has been studied in relation with these types of instructions, the relationships among these cognitive styles, the deductive-inductive learning style preferences and vocational programs which are also affected by FDI have remained underexplored. For this reason, the gap in the literature is needed to be filled conducting research that investigates the relationships among these variables.

1.3. Purpose of the Study

The present study aims to investigate the cognitive styles of 11th grade EFL learners studying at chemical technologies and child development-education programs in a Vocational and Technical Anatolian High School in terms of FDI. Another aim of the study is to investigate field dependent and field independent learners' learning style preferences while learning EFL. Taking these purposes into account, this study aims to explore the relationship between FDI cognitive style of learners and the types of programs; between the learning style preferences of learners and the types of programs; and the possible relation between the cognitive styles and the deductive-inductive learning style preferences of 11th grade EFL learners studying at chemical technologies and child development-education programs.

More specifically, the study addresses the following research questions:

1.a. What kind of a cognitive style do 11th grade EFL learners studying at chemical technologies and child development-education programs in a Vocational and Technical Anatolian High School have in terms of FDI?

b. Is there a significant relation between FDI cognitive style of learners and the types of programs?

2.a. What are the learning style preferences of field dependent and independent 11th grade EFL learners studying at chemical technologies and child development-education programs in a Vocational and Technical Anatolian High School?

b. Is there a significant relation between the learning style preferences of learners and the types of programs?

3. Is there a significant relation between the cognitive styles and the deductive-inductive learning style preferences of 11th grade EFL learners studying at chemical technologies and child development-education programs in a Vocational and Technical Anatolian High School?

1.4. Overview of Methodology

The present study was conducted with a quantitative approach to research to examine the relationships among the learners' cognitive styles, learning style preferences and vocational programs. To achieve this purpose, 169 students were selected as participants from two different vocational programs in a state, Vocational and Technical Anatolian High School in Istanbul. While 90 students were studying at chemical technologies, 79 students were studying at child development-education programs. These participants were administered the Turkish language version of Group Embedded Figures Test (GEFT) (Okman-Fişek, 1979) and the Turkish language version of Learning Style Survey (LSS) (Cesur, 2008) for the purpose of collecting data.

The procedure began with piloting of the GEFT with 80 ninth graders who were studying at common program in the 2016-2017 academic year. After the piloting, the actual data for the current study was collected administering the GEFT and the LSS to the participants of the study in the spring semester of the 2017-2018 academic year. The time allocated for the GEFT was 12 minutes, i.e., 2 minutes for the first part and 10 minutes for the second and the third parts, as in the studies of Jamieson (1992) and Johnson et al. (2000). When the students finished answering the GEFT, they were required to answer the LSS. It took a 40-minute classroom hour to administer both tests to the participants.

Based on the analysis of the data collected through the GEFT, while some of the participants were determined as field dependent, some of them were found field independent. Additionally, the participants' learning style preferences were detected as deductive and inductive after the analysis of the LSS.

Prior to further investigation, the data collected through both instruments were checked for normal distribution. Because the data were not normally distributed, the chi-square analysis was run to find how FDI cognitive style and the learning style preferences of

learners were related to their choice of vocational programs. Additionally, the relation between the cognitive styles and learning style preferences of the learners studying at the vocational programs were analyzed through the phi correlation coefficient (ϕ).

1.5. Significance of the Study

In language classes, students differ in various ways which, in turn, affect their achievement (Ortega, 2013). Thus, to facilitate language learning, the necessity of exploring the effects of individual differences on language learning has emerged. To help the students achieve learning a language, certain factors should be taken into account by EFL teachers.

One of these factors is their cognitive styles. To date, various studies have been carried out to investigate the effectiveness of cognitive styles on learners' success in learning a language. At one point, the cognitive style of field independence was found to be an effective factor in language learning on different test types (Abraham, 1985). From this perspective, Abraham (1985), Alptekin and Atakan (1990), Carter (1988) and Hoffman (1997) point out that field independence plays an important role in the learning environment where learners are usually presented rules or basic concepts of the target language through more formal, and deductive way of teaching. In this sense, Abraham (1985) and Hoffman (1997) highlight the importance of considering the effectiveness of teaching approaches in relation with the cognitive styles.

Students' FDI cognitive style can be determined for instructional purposes to enhance their learning experience with the most suitable teaching approaches in an appropriate vocational program. Besides, students can be given better guidance in selecting a vocational program.

It is also important to find if there is a match between their cognitive styles and their learning style preferences. Thus, further investigation is necessary to highlight this issue. In

this way, becoming aware of their students' cognitive styles and preference for a certain learning approach, EFL teachers may make language learning easier and help their students achieve better. In addition, the students may become aware of their own learning styles along with their strengths and weaknesses in terms of language learning.

In this sense, the current study is significant in that it aims to provide more empirical data on this issue by examining the relationships among 11th grade EFL learners' cognitive styles, their preference for deductive or inductive way of learning, and vocational programs. If this kind of relationship is found to be significant, the findings may have crucial implications for administrations, curriculum developers, language teachers, and language learners at vocational schools.

1.6. Limitations of the Study

The current study has some limitations. First of all, the study is focused on FDI among other cognitive styles. In doing so, since mathematics and science are more likely to be suitable for field independent learners while human relationship and education usually appeal to field dependent learners (Witkin et al., 1977), according to the findings of research, only two vocational programs, namely chemical technologies and child development-education, were chosen as the context of the present study.

Second, based on the studies conducted to explore the relationship between FDI and the deductive-inductive instructions (Abraham, 1985; Behçetoğulları, 1992; Wang, 2012), among all the learning styles, only two, deductive and inductive, were investigated within the scope of this study. On the other hand, for the current study, these concepts were taken into account as learning styles to reveal the students' preferences. In this way, two learning style preferences were matched with the cognitive styles.

Third, all of the participants were female in the study because of the fact that only female learners could be enrolled in this Vocational and Technical Anatolian High School. In addition, these participants were 11th graders for three main reasons. First, while collecting the data for the current study, the 9th graders were studying at common program, but not at vocational programs. Considering this fact, 9th graders were eliminated. Second, the piloting of the data collection instrument for the study was carried out with 9th graders in the 2016-2017 academic year. Since the actual data was collected in the 2017-2018 academic year and 10th graders had already taken the GEFT when they were 9th graders, they were also excluded from the study. Lastly, since 12th graders were required to have hands-on field experience in three days of the week, it was hard to find them anytime at school. As a result, 11th graders were selected to be the participants of the study.

Apart from these, the study was conducted in only one Vocational and Technical Anatolian High School, a state school located in the Asian part of Istanbul. Participants from different schools in Istanbul and in other parts of Turkey could have revealed different results. Therefore, the findings cannot be generalized to students in all Vocational and Technical Anatolian High Schools in Turkey.

Another limitation is that the study adopted a quantitative research design by collecting data only through the surveys of the GEFT and the LSS. The participants could not be interviewed due to time limitations. Further studies can consider collecting qualitative data as well for an in-depth exploration of the issue.

Lastly, although the LSS instrument involves statements with regard to other learning styles including visual, auditory, tactile/kinesthetic, extroverted and introverted, only the construct of deductive and inductive learning styles with 5 statements on language rules were used to collect data since the study was mainly concerned with these two. In doing so, deductive and inductive constructs were only examined in terms of the preferences of the

learners. It should also be noted that the findings of the present study could have been different if field dependent and field independent learners had been taught through deductive and inductive approaches prior to LSS.

1.7. Definitions of Significant Terms

Cognitive style can be described as the individual difference in mental ability through which people process the data to learn something, i.e., categorizing or coding the data in mind (Hoffman, 1997).

Field dependent learners can be regarded as the learners that holistically process the mental information (Hoffman, 1997).

Field independent learners can be defined as the learners that analytically process the mental information (Hoffman, 1997).

Learning style can be considered the way information is processed depending on factors like experience, environment and inheritance (Cesur & Fer, 2009).

The deductive learning can be regarded as an approach that begins with providing the learners with the target language knowledge and then proceeds with various examples including the structures that the learners are required to learn. When the students get the main idea/knowledge from the sentences, other examples are presented, thus, giving an opportunity to the learners to put what they have learned into practice (Shaffer, 1989).

The inductive learning, known as the rule-discovery learning, enables learners to infer the key concepts or the rules from the given contexts/sentences. At the beginning of the teaching process, teachers provide the learners with various examples. In doing so, learners take the responsibility of their own learning of the key concepts and the rules (Shaffer, 1989).



CHAPTER II

LITERATURE REVIEW

2.1. Background for Cognitive Styles and Learning Styles

Individual differences and learners' learning behaviors are among the most commonly explored issues in the field of SLA (Meguro, 2020). A vast amount of research has been conducted to understand individual differences and how these differences influence learners. The curiosity led the teachers and the researchers to find whether individual differences also make a difference in the achievement of the learners (Abraham, 1985).

What makes a second language learner different from the other learners? Apart from some typical features such as gender and age, it is possible that affective aspects such as being eager to learn, preference in learning and attitude along with cognitive aspects such as aptitude for language, intelligence and cognitive learning styles may vary from person to person (Hoffman, 1997; Jamieson, 1992), the outcome of their achievement in language learning as well (Abraham, 1985).

Intelligence can be regarded both as an individual difference and indicator of how much people know. Styles, on the other hand, act as mental guides showing intelligence the appropriate ways of using the knowledge. From this perspective, intelligence may not be enough to learn something (Jamieson, 1992), but in order to facilitate learning, styles are required. Therefore, it comes as no surprise that lately, in the field of education and especially, in SLA, styles are generally discussed as one of the most important individual differences (Kamińska, 2014).

As Ortega (2013) states, styles indicate the choice of the alternatives for information processing. These choices are usually considered learning styles or cognitive styles, which, according to Kamińska (2014), are significant ones. Some linguists, theorists or researchers

including Ortega (2013) and Skehan (1991) use these two concepts interchangeably. In other words, learning styles are generally considered equivalent to cognitive styles. In fact, it is significant to underline the fact that these two concepts also reveal some differences (Kamińska, 2014). Firstly, Riding and Cheema (1991) emphasize the bipolar nature of cognitive styles such as field dependent versus field independent. In other words, if one is not field dependent, they are then considered field independent. Secondly, Brown (1994) points out that while cognitive styles particularly fit an academic situation, learning styles mainly encompass several elements related to affection and psychology, which, in turn, makes learning style a broader concept (as cited in Kamińska, 2014).

Prior to discussing these concepts in details, it is worth underlining that in the present study, FDI is examined under the scope of cognitive styles while deductive and inductive terms are analyzed as learning styles. Thus, the current study separates the cognitive styles from the learning styles.

2.2. Cognitive Styles

Cognitive styles, known also as the individual difference (Tinajero et al., 2011), can be considered as the mental ability to deal with the data in various ways such as obtaining, categorizing and remembering it, which, in turn, affects the ways in which learning takes place (Alptekin & Atakan, 1990; Hansen & Stansfield, 1981, Hansen & Stansfield, 1982; Hoffman, 1997; Pithers, 2002; Skehan, 1991).

Being eager to study on individual differences such as personality, Allport laid the foundations of the term 'cognitive styles' in 1937 (Kamińska, 2014). Thus, the investigation of cognitive styles began with the laboratory studies. Inspired by Allport, the studies were conducted for an in-depth exploration of the issue in the 1940s (Jamieson, 1992). In the 1950s, the research on cognitive styles aimed to inform the teachers so that they could

provide the learners with appropriate approach that appealed to individual differences. In 1970s, the studies were conducted on this issue in the field of SLA (Hoffman, 1997).

2.2.1. Characteristics and Types of Cognitive Styles

Tinajero et al. (2011) and Witkin et al. (1977) clearly state that cognitive styles reveal individual differences, but at the same time, they shape a person's character and shows what type of personality one can have. Witkin et al. (1977) also state that due to being a part of personality, of course, not all of them but the majority of the cognitive styles are difficult to change.

Taking the variety in cognitive styles into account, Hartnett (1980) forms two cognitive categories, i.e., “analytical” and “holistic”, thus listing several cognitive styles under the names of these terms. For examples, the “analytical” category consists of *field independent, verbal, analytic, serialist* and *sequential-successive* while the “holistic” group includes *field dependent, imaginal, relational, simultaneous-synthetic* (as cited in Alptekin & Atakan, 1990). Similarly, Xu (2011) lists various cognitive styles such as *focuser-scanner, serialists-holists, divergent-convergent thinkers* and *field dependence-field independence*.

Among other things, Ortega (2013) regards the model of cognitive style constructed by Ehrman and Leaver in 2003 as one of the most favorable one. Having bipolar dimensions, this model reveals “synopsis-ectasis” aspects. Becoming discontented with the models revealing two categories such as “global” and “analytic”, Ehrman and Leaver (2003) forms a model as the opposite of Hartnett (1980), i.e., Hartnett (1980) forms the categories as “analytical” and “holistic” whereas Ehrman and Leaver (2003) construct the categories as “synopsis” and “ectasis”. In doing so, they aim to understand the meanings of the concepts clearly. They, therefore, try to diagnose the appropriate cognitive styles (Ehrman & Leaver, 2003).

Taking a closer look at the Ehrman-Leaver cognitive styles model, it can be noted that both the “synopsis” and “ectasis” parts of the model consist of 10 cognitive styles. The cognitive styles such as *field sensitive*, *field independent*, *random*, *global*, *inductive*, *synthetic*, *analogue*, *concrete*, *leveling* and *impulsive* are listed in the “synopsis” part while the cognitive styles like *field insensitive*, *field dependent*, *sequential*, *particular*, *deductive*, *analytic*, *digital*, *abstract*, *sharpening* and *reflective* are included in the “ectasis” part.

2.2.2. Field Dependence-Independence (FDI)

Field dependence which adopts a holistic approach is mainly regarded as the cognitive ability to examine something as a whole rather than focusing on details. On the other hand, field independence is generally related to the ability to analyze something separating into pieces of a whole (Alptekin & Atakan, 1990; Carter, 1988). According to Carter (1988), learners having the cognitive style of FDI may be positively or negatively affected at the time of learning something (e.g., a foreign language). Similarly, Meguro (2020) states that being field dependent or field independent can lead to achievement in acquiring a second language. From this perspective, it is significant to understand how these cognitive styles affect learners as well as the characteristics of field dependent and field independent learners.

Field dependent learners are in favor of making mutual effort to learn, unlike field independent learners who enjoy studying on their own. In this sense, collaborative learning enables field dependent learners to achieve better (Jamieson, 1992; Skehan, 1991). As a result, they also find an opportunity to collaborate with others and share their feelings (Hansen, 1984; Hansen & Stansfield, 1982). In this way, being exposed to the teacher intervention is not a problem for them. On the contrary, they find it beneficial (Jamieson, 1992).

Apart from these, field dependent learners want to be motivated by something or someone rather than themselves. In fact, this expectation enables them to be more social and interact with different people. Therefore, field dependent learners, who enjoy social activities, can be a teacher or a nurse, can provide advice for people and deal with community service (Hansen & Stansfield, 1982; Witkin et al., 1977). According to Hoffman (1997), being social and interacting with people also facilitate SLL thanks to improved abilities in communication. In this way, field dependent learners achieve better when they are required to accomplish tests related to communication (Johnson et al., 2000).

Another distinguishing feature is field dependent learners' generally concentrating on the big picture ignoring the details of a statement or a reading text. They can easily find the general idea of the statements or texts. Based on these features, it comes as no surprise that field dependent learners are also called global learners (Hoffman, 1997; Xu, 2011). In this regard, as Stansfield and Hansen (1983) point out, they do not prefer analysis, hypothesis building or examination to come up with any answer to the questions. On the contrary, they mainly play an inactive role as an observer while learning (Hansen & Stansfield, 1982).

As for field independent learners, when encountered with a problem, they generally try to analyze and examine the theories in such a way that they can come up with an answer to the problem (Hansen & Stansfield, 1982; Jamieson, 1992; Stansfield & Hansen, 1983). They see and distinguish the details within a whole (Hoffman, 1997) as they are generally analytic learners (Skehan, 1991, Xu, 2011). This analytical view provides them with a greater advantage on language learning (Hansen & Stansfield, 1982; Hoffman, 1997; Hwu et al., 2014; Jamieson, 1992), because they can easily grasp the meaning of the sentences or a reading text focusing on the details (Xu, 2011).

In line with Hansen and Stansfield (1982), Hoffman (1997), Hwu et al. (2014) and Jamieson (1992), Abraham (1985) also points out that field independent learners achieve

better at language learning when they are taught deductively. Contradicting with Abraham (1985), Jamieson (1992) states that the only thing field independent learners need at the time of learning is the enthusiasm in learning and trust in themselves. In this sense, they achieve better if they are not exposed to teacher intervention. In other words, as the term 'field independent' suggests, they want to be independent and feel confident (Hansen, 1984).

Having these said, being a scientist, mathematician or engineer serves as an ideal profession for field independent learners (Hansen & Stansfield, 1982; Witkin et al., 1977), who are good at problem solving and examining theories.

2.3. Learning Styles

Originating from the field of psychology, the term 'learning style' deals with the individuals and their behaviors in learning (Xu, 2011). According to Skehan (1991), learning styles indicate an individual's preferred way of learning something. Similarly, Xu (2011) regards learning style as a certain, preferable technique for a learner. Keefe (1979a) and Keefe (1982), as quoted in Kamińska (2014) and Reid (1987), mention cognitive, affective and physiological dimensions of learning styles emphasizing their effects on an individual's behaviors in an academic atmosphere in which teaching and learning take place.

2.3.1. Characteristics and Types of Learning Styles

Learning styles reveal six elements that are linked to one another. These elements are listed by Oxford and Anderson (1995) as cognitive aspect, executive aspect, affective aspect, social aspect, physiological aspect and behavioral aspect (as cited in Cohen & Weaver, 2005).

Oxford and Anderson (1995) give a brief explanation for each aspect stating that cognitive aspect is more related to the mental activity for information processing. The second element is the executive aspect through which the learners take the responsibility of

their learning. Additionally, the affective aspect of learning styles generally takes the learners' feelings, behaviors and opinions into account. Apart from these, the social aspect deals with the interaction of people at the time of learning while the physiological aspect is much more related to sense and perception. The last aspect is the behavioral aspect which indicates the learners' attempt to find certain ways that appeal to their favorite options in learning (as cited in Cohen & Weaver, 2005). Taking these aspects of learning styles into consideration, Cohen and Weaver (2005), sum up these aspects in 3 categories as "sensory/perceptual learning style", "psychological/personality type" and "cognitive learning style".

The category of "sensory/perceptual learning style" consists of *visual*, *tactile/kinesthetic* and *auditory* types. *Visual* learners who have a flair for learning through vision are more likely to learn with the help of visual aids such as pictures or tables. The learning style *tactile/kinesthetic* mainly appeals to the learners who enjoy learning through practice and experience using their sense of touch. As for *auditory* learners, hearing and listening to something facilitate their learning.

The second category "psychological/personality type" includes learning types such as *extroverted-introverted*, *random intuitive-concrete sequential*, *closure oriented-open oriented*. Taking the concepts *extroverted-introverted* into account, *extroverted* learners can be regarded as those who learn better by being in touch with their environment while *introverted* learners give importance to their internal feelings. Abstraction is significant for *random intuitive* learners who eagerly study on the possibilities or relationships to see the circumstances as a whole. Unlike the *random intuitive* learners, *concrete sequential* learners tend to learn in a linear way and pay attention to instructions to carry out them precisely. *Closure oriented* learners like keeping the circumstances under control in order to eliminate uncertainty. Thus, they want to reach a conclusion as soon as possible. On the other hand,

open oriented learners are open to new opportunities. In doing so, they investigate, learn and as a result can change what they have learnt.

The third category, “cognitive learning style”, consists of *global-particular*, *synthesizing-analytic*, *sharpeners-levelers*, *deductive-inductive*, *field dependent-field independent*, *impulsive-reflective*, *metaphoric-literal* types. *Global* learners want to see the whole picture while learning whereas *particular* learners like focusing on the details and discriminating. Similar to *global* and *random intuitive* learners, *synthesizing* learners want to learn seeing something as a whole. *Analytic* ones, on the other hand, like to analyze to see the pieces of a whole. When it comes to the *sharpeners*, they are keen on differentiating elements of something. On the other hand, *levelers* generally focus on the similarities of items rather than the differences. *Deductive* learners prefer starting to learn from explanations and then go with the examples while *inductive* learners prefer grasping the new information from the examples. *Field dependent* learners see the whole picture just as *global*, *random intuitive* and *synthesizing* learners while learning whereas *field independent* learners are analytic learners. *Impulsive* learners proceed data in a quick way without avoiding taking a risk. *Reflective* learners tend to be more cautious and slower while learning in order to avoid taking a risk. Apart from these, *metaphoric* learners are likely to learn through metaphorical examples. Unlike to *metaphoric* learners, *literal* learners prefer word for word explanations rather than metaphorical examples.

2.3.2. Deductive/Inductive Way of Learning

In order to understand what makes people deductive and inductive learners, it is significant to comprehend what deductive and inductive approaches are. Deductive and inductive approaches can be regarded as two important ways of teaching (Jean & Simard, 2013; Widodo, 2006). Deductive way of teaching highlights the importance of presenting the

basic rules or concepts at first and practicing the rules with the help of various examples (Haight et al., 2007; Herron & Tomasello, 1992; Shaffer, 1989; Widodo, 2006). In contrast to deductive approach, inductive way of teaching aims to provide learners with a great deal of examples in order to help them grasp the basic rules or key concepts within the given examples. In other words, inductive approach facilitates rule discovery (Decoo, 1996; Herron & Tomasello, 1992; Widodo, 2006).

The deductive instruction enables language teachers to provide the learners with the basic structures or the key concepts of the target language using an explicit way of teaching (Decoo, 1996; Dekeyser, 1994; Erlam, 2003; Jean & Simard, 2013; Krashen & Seliger, 1975; Widodo, 2006). In this respect, Ellis (1998) regards this type of instruction as direct explicit instruction. In other words, this instruction, which is also defined as cognitive approach (Terrell, 1991) or focus-on-forms instruction (Ellis et al., 2002) enables learners to pay much more attention to the form/structure of the grammar following the steps as Present-Practise-Produce (PPP) (Ellis, 2006; Ellis et al., 2002; Terrell, 1991). According to Ellis (2006), as for the 'practice' stage, it is significant to use drills or tasks. From this perspective, the teacher provides the learners with the basic patterns of the target grammar structure and the learners study the structures with the help of the oral exercises given in a context (Herron & Tomasello, 1992). As for the inductive instruction, Ellis (1998) defines this kind of learning as indirect explicit teaching with the help of which the learners accomplish consciousness raising tasks. In this regard, learners play an active role in the learning process.

Deductive and inductive learners can be grouped based on the explanations of deductive and inductive approaches. Cohen and Weaver (2005) state that deductive learners prefer seeing the whole picture while learning. In other words, they want to be provided with the basic information and explanations at first. Supporting Cohen and Weaver (2005), Ehrman and Leaver (2003) also draw attention to the fact that providing deductive learners

with various examples may lead to confusion. For that reason, in most cases, they need the detailed explanations presented by the teacher at the very beginning of the learning process. According to Cohen and Weaver (2005) and Ehrman and Leaver (2003), as for inductive learners, on the other hand, starting the learning process with a great number of examples is a fascinating thing. In this way, they have an opportunity to discover the information or rules on their own without an explanation provided by the teacher.

2.4. Studies on Field Dependence-Independence (FDI)

2.4.1. Field Dependence-Independence (FDI) in EFL/ESL Contexts

As Meguro (2020) and Tinajero and Paramo (1998) highlight the importance and effectiveness of FDI in acquiring a language, these cognitive styles have become a major issue in the field of SLA. Thus, as mentioned earlier, many studies have focused on the effectiveness of FDI in the field of language. Although there are a great number of studies on FDI in ESL context, the literature lacks the studies in EFL, in particular, Turkish EFL context.

One of the studies on FDI was conducted by Hansen (1984) in ESL context to investigate the relation between FDI and learners' achievement in English language. To conduct research, 286 participants were selected from six different cultures including Samoan, Tongan, Tahitian, Fijian, Indian-Fijian, and Hawaiian. In doing so, FDI was also examined among different cultures. The data was collected through three tests such as the Michigan Test of English Language Proficiency (MTELP), a cloze test and the Embedded Conversations tests in first and second language. The results of the study revealed that among the cultures, the Hawaii learners were significantly more field independent. Taking all the cultures into account, it was also found that the male students were significantly more field independent than the females. The other finding was that in all groups, a positive

relation was found between the field independence and the learners' performance. That is, the field independent learners better achieved language learning. However, the relation was concluded not to be an effective indicator of the students' achievement in English.

Jamieson (1992) also investigated the interactive effect between FDI and the achievement in English learning. Another aim of the study was to establish the relation between the cognitive styles of reflection/impulsivity and language achievement. English proficiency level of adult language learners were detected through the Test of English as a Foreign Language (TOEFL). To determine FDI, the GEFT was used in the study. The result of the research showed that there was a positive relation between the field independence and ESL proficiency. Additionally, the cognitive style of FDI was found to be more effective than the cognitive styles of reflection/impulsivity on ESL proficiency. As in Hansen (1984), field independence was found to be positively in relation with the learners' ESL achievement. However, it was not an indicator showing how the learners achieved throughout a semester, and the same went for reflection/impulsivity. Jamieson (1992) attributed such a finding to the influence of the correlation of field independence and the pretests.

Another study, in ESL context, was conducted by Johnson et al. (2000). Their study aimed to explore whether the field dependence was more advantageous to succeed in second language. To achieve the purpose of the study, 28 native English speakers and 29 ESL students studying at a university were administered tests to determine both their language proficiency (e.g., the observation form, conversation and metaphor fluency for communicative competence and the picture vocabulary and verbal analogies) and FDI (e.g., the GEFT). The results of the study conducted by Johnson et al. (2000) contradicted with the previous research findings. Native English speakers outperformed the other group of students in terms of language proficiency. In ESL group, on the other hand, field dependent learners performed better at SLL when the tasks were presented in a communicative

approach. Johnson et al. (2000) suggested that instead of using formal tasks, presenting communicative ones would facilitate language learning, especially for field dependent learners.

Another study was conducted by Meguro (2020) in ESL context to find the efficacy of FDI and analogical reasoning for second language instruction. To achieve the purpose of the study, 46 Japanese 10th graders studying at senior high school were selected as participants. The participants consisting of 30 males and 16 females were presented English relative adverbs including where, when, and why through texts. The cognitive style of FDI was detected with the help of the GEFT while analogical reasoning was determined using the nonverbal analogies test. The tasks which asked the participants to fill in the blanks revealed how effective the second language instruction was. The findings indicated that SLL was more related to the field independence with higher analogies. In other words, field independent students with higher analogical reasoning better achieved learning the relative adverbs. Meguro (2020) explained that explicit instruction through texts might appeal to field independent students with higher analogical reasoning.

The latest study, in ESL context, was carried out by Yeldham and Gao (2021). Their study aimed to reveal the interaction of the cognitive styles and listening instruction methods. Running a factorial design, cognitive styles included global-analytic and field dependent-field independent while instruction methods included strategy and interactive approaches. Yeldham and Gao (2021) pointed out that strategy instruction was mainly carried out through top-down process whereas interactive one was heavily bottom-up. As for participants, 67 learners with lower-intermediate to intermediate level of English studying at university were selected. Before the instructions, the participants were administered the LSS and the GEFT to detect the cognitive styles of global-analytic and field dependent-field independent, respectively. The participants were grouped as the strategy instruction class with 33

participants and the interactive class with 34 participants. The finding of the study revealed that the strategy class including top-down process which enabled learners to listen to get the gist of the texts and infer the meanings appealed to more global and field dependent learners. As Yeldham and Gao (2021) commented on the findings, to facilitate learning, it was significant to find the appropriate instruction for the learners with a specific cognitive style.

In Turkish EFL context, Alptekin and Atakan (1990) conducted research in order to find whether field independence influences the students' performance in SLL. Another aim of their study was to find the relation between the success in language learning and the hemisphericity. To this end, 69 Turkish students studying at an intensive EFL program was administered achievement tests along with the GEFT to detect the learners' FDI. The results showed a positive correlation between the scores of the GEFT and the L2 achievement tests. Field independent learners, as opposed to the field dependent ones, better achieved language learning. Their study put forward a suggestion that learners' FDI should be considered in order to provide them with suitable instruction and teaching tools.

The most recent study in Turkish EFL context, a PhD (Doctor of Philosophy) thesis, was conducted by Köse (2018) to find the effects of FDI on learners' strategies for language learning (e.g., memory, cognitive, compensation, metacognitive, affective and social), learning style preferences (e.g., visual, auditory, kinesthetic) as well as the success in different skills such as reading, writing, listening, speaking and vocabulary. In his study, 123 students studying at university were administered the GEFT, the Turkish language version of Rebecca Oxford's Strategy Inventory for Language Learning (SILL), and the BIG16 Learning Modality Inventory. The study revealed that there was a significant relation between FDI and success in language in all skills, excluding the skill of vocabulary. On the other hand, it was found that there was not a significant relation between the learners' FDI and learning style preferences. A significant relation was also found between FDI and the

language learning strategies including cognitive, compensation and metacognitive. Based on the findings, Köse (2018) recommended carrying out an in-depth exploration in order to better understand how cognitive styles, learning styles and learning strategies interact with one another at the time of language learning.

2.4.2. Field Dependence-Independence (FDI) in Other Fields

Originating in the field of psychology, it is not surprising that FDI has also been studied in various fields such as science, mathematics, economics and child development (Chandran et al., 1987; Daines, 1977; Danili & Reid, 2004; Frank, 1986; Özarıslan & Bilgin, 2016; Şahin & Ateş, 2020). Witkin et al. (1977) note that field independent learners are generally concerned with studying science, mathematics, engineering and architecture compared with field dependent learners studying sociology, playing an active role in education teaching at an elementary school.

Chandran et al. (1987) support Witkin et al. (1977) stating that various aspects, one of which is FDI, play an important role in science education, especially in chemistry. As they further point out, the learners studying chemistry are generally considered analytical. Since the nature of chemistry enables learners to infer the key concepts solving problems or analyzing graphics, FDI affects the ways in which learning is achieved.

In an effort to test these hypotheses, Chandran et al. (1987) aimed to explore the effects of formal reasoning ability, prior knowledge, FDI and memory capacity on chemistry achievement. In this sense, they conducted research with 11th grade chemistry students at the age of 15. These students were selected from 11 high schools. Note, however, that despite the different schools, the chemistry syllabus they used was the same. The students' cognitive styles were detected through the Hidden Figures Test. Their study indicated that FDI and memory capacity were not effective to succeed in chemistry. On the other hand, prior

knowledge and formal reasoning ability were found to affect the achievement in chemistry. The study offered to examine the reason why FDI failed to affect chemistry achievement in the scope of the context of the participants, the tasks used and FDI measures' validity.

Likewise, to explore the relationships among the students' working memory capacity, FDI and chemistry achievement, Danili and Reid (2004) conducted research with high school students studying chemistry. Similar to Chandran et al. (1987), they used the Hidden Figures Test to determine the learners' FDI. In contrast to what Chandran et al. (1987) found, their study revealed that field independent learners were more likely to succeed in chemistry than field dependent ones. High working space memory capacity and field independent learners were found to be more successful in chemistry than the low working space memory capacity and field dependent learners. According to Danili and Reid (2004), in fact, the variables including working memory capacity and FDI might play an active role in demonstrating how one could be successful in chemistry.

Frank (1986) reports the study of Messick (1984) supporting the view that FDI plays a significant role while choosing a profession. According to Frank (1986), field independent learners are more successful in mathematics, chemistry or physics. On the other hand, field dependent learners are better at fields like child development, humanistic discipline and education. Keeping this fact in mind, Frank (1986) conducted research to reveal the differences among 427 female learners studying at the program of teacher education. These learners were selected from 6 areas such as natural sciences, mathematics and business; social sciences; humanities; family/child development and home economics; physical education; special education and speech pathology. To find the learners' cognitive styles, the Hidden Figures Test was administered. The students studying at natural sciences, mathematics and business were found to be more field independent when compared to the learners at other areas including humanities, family/child development, home economics, physical education,

special education and speech pathology. Frank (1986) reported that although all the learners were in the same program (teacher education), the areas with the help of which the learners could specialize were linked to the learners' cognitive styles.

Being in agreement with Frank (1986), Daines (1977) pointed out that FDI played a significant role in child career and development program. She studied with 88 learners studying at the child career and development programs. Her research aim was varied. That is, the study focused not only on the cognitive style of FDI but also on the teachers' using direct and indirect influence, the preference of learners' (direct/indirect communication and structured/less structural activities) and the relation between the learning style and preference for an instruction. Hidden Figures Test was used to detect FDI. In doing so, she found that the students studying at child care and development program were mainly field dependent. As another finding of the study, the teachers used direct influence. Additionally, the students preferred indirect instruction at a minor degree. Lastly, the students were satisfied with the instruction. Daines (1977) emphasized the robust relation that was established among the teacher, the students and the instructional method. That's why learning might have been considerably affected.

To test the influence of the students' being field dependent or field independent, scientific thinking skills and attitudes to science on the acquisition of the concepts of the nature of matter, Özarslan and Bilgin (2016) carried out research with 770 8th graders. To detect the learners' cognitive styles, the GEFT was used. The scientific thinking skills test, the nature of matter concepts tests and the attitude scale towards science were decided to be the other data collection instruments. The findings revealed that the field independent learners outperformed the field dependent ones in terms of acquiring the nature of matter concepts. As another finding, there was not a significant difference between the students' being field dependent or field independent and their attitudes towards science. On the other

hand, the significant difference was found between the learners' scientific thinking skills and attitudes towards science. As Özarlan and Bilgin (2016) suggested, since the cognitive styles and the scientific thinking skills played a significant role in the learners' academic performance and their attitudes, the cognitive styles of the learners should be detected and their scientific thinking skills should be improved. In this way, the learners could be provided with the appropriate teaching methods and measurement-evaluation techniques.

The focus of the study conducted by Şahin and Ateş (2020) was on how the students' self-efficacy beliefs for scientific literacy were related to their FDI cognitive style. To this end, 823 7th graders were selected as the participants. The GEFT, mostly used data collection tool, was used to determine the cognitive styles of the participants. The scientific literacy self-efficacy scale was another tool to reveal their self-efficacy beliefs for scientific literacy. As the findings showed, the cognitive styles were found to play a significant role in the students' self-efficacy beliefs for scientific literacy. Similar to what Özarlan and Bilgin (2016) stated, Şahin and Ateş (2020) reported that determining the students' cognitive styles along with the teaching environment and measurement-evaluation techniques that applied to the learners would contribute to their scientific literacy.

The studies mentioned above are the robust indicators, which show FDI is an important issue in different fields as well.

2.5. Studies on Deductive/Inductive Way of Learning

2.5.1. Deductive/Inductive Way of Learning in EFL/ESL Contexts

Literature also lacks the research on the deductive and inductive learning styles. In other words, to date, the studies generally have focused on the effects of these instructions on students' achievement in learning. From this perspective, although the efficacy of both approaches has been discussed not only in EFL and ESL contexts but also in other language

contexts like French, German and Spanish (Haight et al., 2007; Hwu et al., 2014; Shaffer, 1989; Tammenga-Helmantel et al., 2014; Widodo, 2006), further research is needed to explore deductive and inductive issues in terms of learning styles and investigate the students' preference for a deductive or inductive way of learning.

Taking this research gap into account, Nešić and Hamidović (2015) conducted a study in EFL context to find the EFL learners' preference for a deductive or inductive approach at the time of learning English grammar. The participants of the study were 134 learners in the course of the Business English studying at the Business School of Applied Studies. The process started teaching English grammar through deductive and inductive approaches. To reveal what kind of an approach the learners preferred, the learners were asked to answer a 15-item-questionnaire. Based on what the learners had stated, deductive approach was found to be more preferred one by the majority of language learners, i.e., 70% of them had the tendency to prefer formal instruction through which the rules, forms or functions of the structures were explained. As another finding of the study, it was stated that the learners could efficiently acquire English grammar if both approaches were presented in a mixed way. Nešić and Hamidović (2015) related these findings to the learners' background while studying at elementary and secondary schools in terms of learning English grammar. According to Nešić and Hamidović (2015), being familiar with the traditional, formal way of teaching, the students felt more confident with the rules, forms and function, which, in turn, preferred deductive way of learning.

Arifin (2016) explored the influence of deductive and inductive approaches on students' writing performance and investigated the students' attitudes towards these approaches in EFL context as in Nešić and Hamidović (2015). To gather data, two groups, named as deductive and inductive each with 20 students, were formed. The study revealed that the deductive group was more successful than the inductive group. In terms of the

students' feelings, the deductive approach was regarded as a facilitator enabling the students to learn the target language without difficulty. Similar to Nešić and Hamidović (2015), the findings indicated that providing the learners with the explanations and the adequate examples of the target language made them feel confident due to being conscious of what they were supposed to learn.

In another study conducted with 60 EFL learners in language courses studying at a university, Nur (2020) also aimed to find the attitudes of the learners to deductive and inductive approaches while learning English grammar. The sampling was chosen from two classes in order to be taught through the deductive and inductive ways, i.e., one of the classes selected from the physics department faculty of science and technology was taught through deductive approach while the second class selected from the Islamic guidance and counseling department faculty of communication was provided with inductive approach consisting of 36 and 24 students, respectively. The data was collected with the help of questionnaires, observational and interview techniques. Based on the students' expressions, both approaches were found to arouse positive feelings. Besides, all of the participants in the deductive group reported that they preferred deductive way of learning. When it comes to the inductive group, the majority of the participants expressed their eagerness to learn through the inductive way. As Nur (2020) concluded, on the condition that the students were provided with a suitable learning context, the two approaches could motivate the students at the time of learning as well.

The studies on the learners' attitudes towards deductive and inductive approaches clearly indicate that to facilitate language learning, learners' preferences should also be considered. Unfortunately, the studies conducted on this issue are limited. For that matter, as Nešić and Hamidović (2015) highlight, despite the various studies on grammar teaching, there still exists a gap to explore the students' attitudes to learning grammar.

2.5.2. Deductive/Inductive Way of Learning in Other Fields

As mentioned earlier in section 2.5.1., deductive and inductive approaches have become a major issue in the contexts where English or any other language has been taught either as a foreign or second language (Haight et al., 2007; Hwu et al., 2014; Shaffer, 1989; Tammenga-Helmantel et al., 2014; Widodo, 2006). From this perspective, it can be concluded that deductive and inductive approaches have been extensively studied in the field of education. Therefore, it is not surprising that these concepts have been also investigated by many researchers in different fields apart from language teaching (Felder & Silverman, 1988; Jalil, 2006; Oliver-Hoyo & Allen, 2005; Oliver-Hoyo et al., 2004; Prince & Felder, 2006; Prince & Felder, 2007). At one point, inductive approach was found to be more appropriate for chemistry classes. Note, however, that the studies mainly focused on the deductive and inductive concepts in terms of a teaching method, but not a learning style.

Oliver-Hoyo and Allen (2005) and Jalil (2006) conducted research on the effectiveness of deductive versus inductive approach in the context of chemistry, which is also at the heart of the present study. In their study with the students studying chemistry, Oliver-Hoyo and Allen (2005) investigated the effects of the students' involvement in the learning process on learners' approach to chemistry. To this end, two groups were compared, i.e., traditional class consisting of 150 students and SCALE-UP class including 51 students.

It should be noted that Oliver-Hoyo and Allen (2005) regard the environment where the learning is actively carried out as SCALE-UP class. To highlight the issue, as cited in Prince and Felder (2006), Oliver-Hoyo and Beichner (2004) state that SCALE-UP, known as Student-Centered Activities for Large Enrollment University Programs, is the learning environment which supports inductive learning approaches. They further point out that in particular, chemistry and physics courses are taught through the inquiry learning, i.e., one of the inductive methods.

For the purpose of their study, Oliver-Hoyo and Allen (2005) used a pre and posttest design to determine the students' feeling for learning science and anxiety in chemistry learning. The findings of the study revealed that the students who played an active role in the learning environment revealed positive attitudes toward learning chemistry. Such a finding indicated how the SCALE-UP class supported learners' involvement in the learning process and facilitated learning.

To further test whether inductive teaching approach promotes learning and arouses positive feelings, Jalil (2006) also conducted research with the learners studying chemistry which, in turn, obtained similar results. To achieve the purpose of the study, two groups were formed, i.e., group 1: explain and experiment and group 2: experiment and explain. The data was collected through the questionnaire for attitudes and quiz for achievement which were administered to 241 students. The questionnaire mainly dealt with four issues related to the experiments including understanding, enjoyment, achievement and difficulty. The findings revealed that the students who were more successful were in favor of inductive learning approach. In other words, the second group, experiment and explain, was found to be the best that appealed to the students. Concerning the study, Jalil (2006) stated that providing the learners with a chance to do experiments would help them to develop self-confidence with the help of which the learners could solve problems not only in research context but also in their lives.

This view is also supported by Prince and Felder (2006) and Prince and Felder (2007) who state that it is more effective to teach science through inductive approach for achievement, as well as the motivation of the students, because motivating learners is a requirement for inductive learning (Felder & Silverman, 1988). Considering the nature of science, in fact, it is not surprising to better achieve science through the inductive learning. For one reason, the learning process in science courses is designed in such a way that the

learners are actively involved in it. In other words, they take the responsibility of their own learning. For another reason, sciences courses enable students to think, discuss, do experiments and infer rules, thus arousing curiosity. In this sense, this kind of process is considered inquiry-based learning (Oliver-Hoyo et al., 2004). These points are in agreement with Felder and Silverman (1988) and Prince and Felder (2006) who argue that although the teaching process in science and engineering courses is mainly carried out with the deductive approach, inductive approach is much more efficient to facilitate learning. Thus, it is significant to activate inductive learning. According to Prince and Felder (2006), inductive way of teaching provokes thinking which, in turn leads to discovery learning. Similarly, on the issue of engineering, Felder and Silverman (1988) argue that although the teaching process is designed deductively, most of the students in engineering are in favor of inductive learning.

Further research with the learners studying agricultural economics supports the position that inductive approach is highly effective on learners' achievement (Dameus et al., 2004). In their study, Dameus et al. (2004) aimed to explore whether deductive or inductive approach was an effective factor in the achievement of the learners. To this end, 182 students in agricultural economics class were selected as participants. The participants were grouped as inductive and deductive under the name of group A and group B. Using an experimental design, Dameus et al. (2004) administered a pretest and a questionnaire for general information to the participants. The knowledge and the ability of the students in terms of problem solving were also examined with the help of tests. The study revealed that the learners who were taught through the inductive approach were predominantly successful. In this regard, Dameus et al. (2004) suggested presenting more examples and experiments prior to the explanations of an issue.

One of the latest studies was conducted by Nuhoğlu (2020) to find whether deductive and inductive learning approaches affect the learners' problem solving skills. The participants included 40 7th graders studying science. To check the efficacy of the approaches, these participants were grouped as the experiment group 1 consisting of 20 learners and the experiment group 2 consisting of 20 as well. The first group studied using deductive method while the other group used inductive method. Running an experimental design, these participants were administered pre and posttests. Besides, to collect data, problem solving skill inventory was administered. Apart from these, the models developed by the students and the observations of the teachers were evaluated and the students were interviewed. The findings revealed that the problem solving skills of the learners was higher in the first group using deductive method while developing their models. This finding was attributed to the learners' using deductive method, namely top down approach.

Another latest study was conducted in mathematics education by Cardino Jr and Cruz (2020). Their study aimed to find how learning styles and teaching strategies influenced the learners' achievement in mathematics. To this end, 277 9th graders and 5 mathematics teachers in a high school were decided to be the participants. Among the students, the majority of whom were between the ages of 13 and 16, 133 of them were males while the rest was female. When it comes to the teachers, 3 of them were males and 2 of them were females. The students were administered Grasha-Riechmann Learning Style Scales (GRLSS) to detect their learning styles. On the other hand, the teachers were asked to answer the teaching strategies questionnaire to determine the teachers' teaching strategies. The results showed that although the teachers mainly used the cooperative learning, the teaching strategies including cooperative learning, deductive, inductive and integrative approaches were found to significantly affect the students' mathematics performance. As for the learning style, the majority of the students were detected as collaborative. Taking all the learning

styles into account, only independent learning style was found to significantly influence the students' success in mathematics. Based on the findings, Cardino Jr and Cruz (2020) emphasized the necessity and importance of detecting learners' learning styles. In this way, teachers would provide the students with a suitable strategy in order to facilitate mathematics achievement.

Research on the deductive and inductive approaches clearly indicates that no matter what field the study is conducted in, these approaches have been investigated by many researchers.

2.6. Studies on the Interaction of Field Dependence-Independence (FDI) and Deductive/Inductive Way of Learning

As mentioned above, especially, in EFL and ESL contexts, the literature lacks the studies on both FDI and the deductive-inductive learning styles. More importantly, the interaction of FDI and deductive-inductive learning styles is an issue that needs to be explored in Turkish EFL context. Since the current study is mainly concerned with these concepts, not only the studies on FDI or deductive/inductive learning but also the studies that contain these two are introduced below.

As for the interaction of FDI and the deductive-inductive learning styles, in ESL context, Abraham (1985) studied with 61 students having high-intermediate English level to find the relation between FDI and the deductive-inductive ways of grammar teaching. To achieve the purpose of the study, FDI was determined using the GEFT. The findings of the study indicated that field independent learners performed better on learning with deductive instruction while field dependent learners learned better when taught inductively. The study indicated how field dependent or field independent learners could learn a second language grammatical item.

In EFL context, Wang (2012) conducted research with 100 learners at the intermediate English proficiency level. Similar to Abraham (1985), the study aimed to explore the effects of deductive-inductive teaching methods on language learning. Another aim was to investigate whether the cognitive style of FDI affected these two instructions. Both instructions were found to be effective. On the other hand, the students in the deductive group were more successful than the students in the inductive group. Based on this finding, the explicit instruction was concluded to be an effective learning method for EFL Chinese students. Although field independent students taught deductively performed better than field dependent students in the posttest, field dependent learners outperformed field independent learners in the inductive group. Besides, field dependent learners in both groups outperformed the field independent ones although the difference between two groups was not significant. Bearing this in mind, Wang (2012) commented that linking deductive-inductive approaches to the cognitive style of FDI might not affect the learners' success in learning.

Likewise, Behçetoğulları (1992) studied the cognitive style of FDI for her thesis for the degree of Master of Arts (MA). In her study, she explored the relation between FDI and deductive-inductive teaching methods. The participants were 40 Turkish EFL learners having an intermediate English level. As data collection tools, tests for achievement and the GEFT were used. The findings of her study contradicted with those of Abraham's (1985) study. For that matter, the study revealed that field independent learners achieved better when taught deductively. However, field dependent learners in the inductive group did not outperform the field independent ones within the group. In the inductive group, field independent learners achieved better. In this sense, the study indicated that relation did not exist between the learners' being field dependent or field independent and the instructional method. This fact was also in line with what Wang (2012) commented on her study. The

study conducted by Behçetoğulları (1992) also proved the fact that field independent learners were more successful in language learning.

Although Abraham (1985), Behçetoğulları (1992) and Wang (2012) mainly focused on the interaction of the students' FDI and deductive-inductive instructions, the results of their studies revealed contradictory findings. In light of all these, the present study aims to explore the relationships among the students' cognitive styles, learning style preferences and vocational programs. In other words, the current study mainly focuses on the cognitive styles (FDI) and learning styles preferences (deductive-inductive) of Turkish EFL learners. In doing so, the study investigates what the learners' cognitive styles and learning style preferences are, how they are related to the learners' vocational programs and how the learners' cognitive styles and learning style preferences are associated.

In Turkish EFL context, Behçetoğulları (1992) conducted research on these terms (FDI and deductive-inductive) with Turkish EFL learners, but her study dealt with the deductive and inductive styles as teaching methods as in the studies conducted by Abraham (1985) and Wang (2012). Being aware of the necessity of conducting further research on cognitive styles and learning styles, Köse (2018) tried to explore the effects of FDI on students' learning style preferences. However, the learning styles he studied were visual, auditory and kinesthetic. The studies mentioned above ignored the learners' preferences for learning through the deductive and inductive ways.

All in all, considering all these as a gap, the current study tries to fulfill the need for research on FDI and deductive-inductive learning styles along with learners' vocational programs in Turkish EFL context. Since the literature lacks the research examining the cognitive styles and learning style preferences in Turkish EFL vocational context, conducting the current study can contribute valuable findings to the field of SLA.

CHAPTER III

METHODOLOGY

The purpose of the study is to investigate possible relations between the learners' FDI and the types of programs and between the learning style preferences of learners and the types of programs. Another aim is to determine the relation between the cognitive styles and the learning style preferences of high school students in a public Vocational and Technical Anatolian High School in Turkish EFL context.

More specifically, the following questions are addressed.

1.a. What kind of a cognitive style do 11th grade EFL learners studying at chemical technologies and child development-education programs in a Vocational and Technical Anatolian High School have in terms of FDI?

b. Is there a significant relation between FDI cognitive style of learners and the types of programs?

2.a. What are the learning style preferences of field dependent and independent 11th grade EFL learners studying at chemical technologies and child development-education programs in a Vocational and Technical Anatolian High School?

b. Is there a significant relation between the learning style preferences of learners and the types of programs?

3. Is there a significant relation between the cognitive styles and the deductive-inductive learning style preferences of 11th grade EFL learners studying at chemical technologies and child development-education programs in a Vocational and Technical Anatolian High School?

3.1. Setting

This study was carried out in the spring semester of the 2017-2018 academic year in a Vocational and Technical Anatolian High School in Istanbul, which is a state school located in the Asian part of the city. In the 2016-2017 academic year, the piloting of the GEFT was achieved. At the time of the study, the school was called Vocational and Technical Anatolian High School. In 2018, the type and the educational context of the school were changed. Since then, the education has continued under the name of Multi-program Anatolian High School which has contained two school types as Anatolian High School and Vocational and Technical Anatolian High School.

Despite the change in 2018, the vocational and technical education in this school has continued to offer the same programs including information technologies, chemical technologies, child development-education, fashion design technologies, electrical and electronics technologies, and beauty-hair care.

The students were enrolled in these programs based on the scores they received on nationwide exams administered by the Ministry of National Education (MoNE) in Turkey to the 8th graders on the basis of the system called Temel Eğitimden Ortaöğretime Geçiş, known also as TEOG, i.e., until the fall of 2017, students in both private and public schools took these exams in the fall and spring semesters of the academic year in which they were studying in grade 8. As a result, based on the test scores they obtained at the end of the academic year, they found an opportunity to attend either one of the high schools, namely Science, Social Sciences, Anatolian, Fine Arts, Sports, Anatolian Iman-Hatip, Multi-program Anatolian and Vocational and Technical Anatolian where they wanted to study as 9th graders (Büyükgöze-Kavas et al., 2015). However, this system has been changed. TEOG was removed. Instead, the new system was introduced as Liselere Geçiş Sistemi (LGS). In this sense, since 2017, the 8th graders have been administered exams on some basic subjects such

as Turkish, mathematics, science, English, history of Turkish revolution and Atatürk's principles and religious culture and moral knowledge at the end of the grade 8.

Four-year education offered in vocational and technical schools is designed in an effort to achieve two aims: First, the students are trained to succeed in university entrance exams at the end of grade 12, and second, they are well equipped with theoretical and practical knowledge on a prospective vocation of their choice in which they may want to pursue further studies (Akşit, 2007; Schaap et al., 2012; Şimşek & Yıldırım, 2000). In the school where the current study was conducted, the vocational programs that provide students with the foundations of a future career include information technologies, chemical technologies, child development-education, fashion design technologies, electrical and electronics technologies, and beauty-hair care. Since the fall semester of 2020, the 9th graders have studied at either one of these programs for a vocational and technical education. Thus, as of grade 9, they are offered vocation-specific courses along with courses like Turkish literature, history, geography, mathematics, physics, biology, chemistry, religious culture and moral knowledge, physical education, and foreign language. Besides, the students are required to gain hands-on field experience in a real working place in three days of the week in grade 12.

During the 2017-2018 academic year, the English curriculum designed in 2017 by the MoNE had been used for the 9th graders. For the 10th, 11th and 12th graders, on the other hand, the English curriculum designed in 2014 by the MoNE in line with the Common European Framework of Reference (CEFR) was in use. The 11th graders received 4 hours of English instruction a week as part of this curriculum (MEB & TTKB, 2014).

English curriculum of 9th -12th grades highlights the importance of student-centered learning (MEB & TTKB, 2014) which can be defined as the approach supporting the learner autonomy in the learning process by allowing learners to analyze the questions and solve the

problems, thus suggesting possible answers to them under the guidance of the teacher (Pedersen & Liu, 2003). Therefore, the language learning process for the 11th graders is designed in such a way that learners can play an active role.

Taking the CEFR and the English curriculum of 9th-12th grades into account, it is important to note that 11th grade EFL learners are regarded as the students with B1-B2 level of English proficiency (MEB & TTKB, 2014). In other words, the learners are considered independent users of English (Verhelst et al., 2009). From this perspective, as stated in the CEFR, B1 level, known as the threshold level, enables students to communicate using the phrases that they mostly interact with to express their thoughts and experiences. For instance, the learners can get the gist of the topics that they are interested in or familiar with such as the issues in a working area or school and talk about them. B2 level, known as the vantage level, enables students to realize the key points of a complicated text dealing with theoretical and actual issues. To further explain, the students can understand a text on a vocational area that they are familiar with (Verhelst et al., 2009). In this regard, the 11th grade course book developed for the students, who are regarded as independent users, offers communicative way of teaching and adopts an inductive approach for the presentation of language that enables students to acquire the grammar of a foreign language by discovering the forms and functions of language by themselves (Akgedik-Can & Atcan-Altan, 2017).

The students acquiring the language are expected to accomplish various functions such as identifying the events that happened in past, predicting the events that are likely to happen in the future and talking about what they like, hate or prefer. In this sense, the language structures which the students are expected to learn are presented integrating the functions and four skills including listening, speaking, reading and writing. Note, however, that in an attempt to facilitate language learning and support learners to communicate

effectively in a foreign language, listening and speaking skills are more dominantly utilized when compared to the other skills (MEB & TTKB, 2014).

For instance, the students, who are supposed to identify the events in the past, are presented the language structures related to the simple past tense such as ‘-d, -ed, -ied, did, was/were’ that are integral to all skills such as reading, writing, listening and speaking. In other words, in order to enable the students to accomplish this function and learn the target language structures, the students can be asked to listen to a text on past events and talk about a topic revealing the students’ thoughts on the past. When it comes to the reading and writing skills, the students can read a text giving information on the past and write about the past events (MEB & TTKB, 2014). In this way, with little emphasis on the language structures, the grammar of the target language is presented inductively through an integration of four skills.

3.2. Participants of the Study

The study was conducted with 169 Turkish students at grade 11 who attended chemical technologies and child development-education programs. The participants were selected from intact classes. In chemical technologies programs, 11-CT-A consisting of 33 students, 11-CT-B consisting of 29 students and 11-CT-C consisting of 28 students were selected. In child development-education program, 11-CD-A consisting of 23 students, 11-CD-B consisting of 21 students, 11-CD-C consisting of 21 students and 11-CD-D consisting of 14 students were selected. Thus, of 169 students, 90 were studying at chemical technologies and 79 at child development-education programs.

One of the reasons of selecting the 11th graders as participants is that in the 2016-2017 academic year, the piloting of the GEFT, which is one of the data collection tools in the current study, was achieved by administering the test to the 9th graders. Considering this fact,

in the 2017-2018 academic year, some of the 10th graders were likely to take the test. Additionally, 9th graders were not studying at a vocational program at the time of data collection. As for 12th graders, they were generally busy with hands-on field experience. Thus, 9th, 10th and 12th graders were eliminated for the current study.

Despite the fact that 11th graders study at various programs such as information technologies, fashion design technologies, electrical and electronics technologies, and beauty-hair care, only chemical technologies and child development-education programs were included in the study. According to Witkin et al. (1977), the learners, who are better at analyzing and structuring as an indication of having a cognitive style of field independence, are more likely to deal with mathematics and science, thus being a mathematician or a chemist in the future. On the other hand, the learners having an interest in sociability and human relationship are considered to be field dependent learners who tend to study humans, their relationships and culture or teach at an elementary school. In light of this issue, to identify the relationships among the 11th grade learners' programs they are studying at, their cognitive style of FDI and learning style preferences, the learners studying at chemical technologies and child development-education programs were selected as the participants of the study.

As stated in section 3.1., the students were enrolled in this school on the basis of the scores they received on TEOG exam in the 2014-2015 academic year. As for the language proficiency levels, the students were considered to have B1-B2 level of English proficiency.

It should also be noted that since only female students are enrolled in this school, the participants were female learners. The students whose parents were asked for permission (see Appendix A) and who had been informed about the study volunteered (see Appendix B) for the study.

3.3. Data Collection Instruments and Procedure

Data for the study was collected through two instruments: The Turkish language version of GEFT developed by Oltman, Raskin and Witkin in 1971 (Okman-Fişek, 1979) and the Turkish language version of LSS developed by Cohen, Oxford and Chi in 2001 (Cesur, 2008).

Before administering these tests to the participants, the procedure started preparing a Turkish research proposal for Istanbul Provincial Directorate of National Education. The proposal consisted of the data collection instruments as well. The proposal was evaluated by the committee to see if the research could be conducted. After the research and the data collection tools were approved, the permission was obtained. Yeditepe University, the Institute of Educational Sciences, the Vocational and Technical Anatolian High School in which the present study was carried out, the participants and their parents were also informed about the permission. In this way, the approved versions of the tests were prepared to administer to the participants on the basis of voluntary participation.

3.3.1. Group Embedded Figures Test (GEFT)

Group Embedded Figures Test (GEFT) that was developed by Oltman, Raskin and Witkin in 1971 to determine the cognitive styles of learners has been one of the most extensively used tests by researchers interested in how a second language is acquired by those with different cognitive styles (Abraham, 1985; Alptekin & Atakan, 1990; Carter, 1988; Hansen, 1984; Hansen & Stansfield, 1981; Hansen & Stansfield, 1982; Jamieson, 1992; Johnson et al., 2000).

The reason why the GEFT is an extensively used test is that its validity and reliability have been well established by a great number of researchers (Pithers, 2002). For instance, as cited in Alptekin and Atakan (1990), Oltman et al. (1971) point out that the test is reliable

with a degree of .82. Thompson and Melancon (1987) also state that the test is valid and reliable with generalizability coefficients degrees of .88 and .94. Similarly, Jamieson (1992) has established the reliability of the test with a degree of .88 using Spearman-Brown formula.

Another instrument commonly used to determine cognitive styles is Riding's (1991) Cognitive Style Analysis (CSA) test (Parkinson et al., 2004; Peterson & Meissel, 2015). Although the CSA is more recently developed test than the GEFT, it was not selected as the data collection instrument for the present study for two main reasons. First, CSA test measures only verbal-imagery and wholistic-analytic dimensions of the cognitive styles, not FDI. Second, the GEFT is available in Turkish language. It was adapted to Turkish by Okman-Fişek (1979) and its reliability was found to be .91 (Alptekin & Atakan, 1990). Besides, it was easy to contact Okman-Fişek for an official permission, which, in turn, was a robust opportunity to access the test. Hence, data was collected after getting her permission (see Appendix C).

The GEFT identifies FDI with 18 complex shapes which contain hidden simple figures (Abraham, 1985; Alptekin & Atakan, 1990). The test consists of three parts: The first part enables learners to practice on 7 items. These items are the geometric shapes that contain simple figures. In total, there are 8 simple figures named A, B, C, D, E, F, G and H. Learners are required to find the hidden simple figures embedded in complex shapes. Students are provided with sample items for practising in the first part of the test. For instance, the first item asks learners to find the simple figure B embedded in a complex shape. After practising the first part, the process continues with the second and the third parts. The second and the third parts contain 9 figures each with a total of 18 complex geometric figures (Alptekin & Atakan, 1990; Johnson et al., 2000) (see sample figures in Appendix D). Since the learners are expected to answer 18 items each with 1 point, the highest possible point they can get from the test is 18. In this sense, based on the scores that

range from 0 to 18, the students are grouped as field dependent and field independent learners. Learners who have higher scores are considered field independent whereas learners who obtain lower scores are regarded as field dependent (Abraham, 1985; Johnson et al., 2000). The score of 11 was taken as the cutoff point in this study in reference with Abraham's (1985) study. As cited in Abraham (1985), Abraham (1981) found the mean score of the GEFT as 10.4. In this way, determining the cutoff point as 11, the learners who received 11 and above were regarded as field independent while those who received a score less than 11 were determined as field dependent.

The field dependent learners are expected to perceive the picture as a whole without analyzing the parts and detecting the specific items (Xu, 2011). The field independent learners, however, are analytic. Thus, they are expected to analyze and detect the parts or specific items that are integral to a whole shape (Alptekin & Atakan, 1990; Carter, 1988; Hoffman, 1997; Skehan, 1991; Xu, 2011). In short, the students' performance on finding the hidden simple figures integrated in complex parts determines the level of their cognitive learning styles.

3.3.1.1. Piloting of GEFT

The piloting of the test was achieved with 80 Turkish female students at grade 9 in the 2016-2017 academic year. The students were selected from three intact classes: 9-B consisting of 28 students, 9-C consisting of 28 students and 9-D consisting of 24. The reason of selecting these classes was that the researcher also taught English to these classes.

After selecting the classes, the test was administered to the students. The time allocated for the test was determined as in Jamieson (1992) and Johnson et al. (2000). In their studies, Jamieson (1992) and Johnson et al. (2000) had given their participants 12

minutes for 18 items. More specifically, participants were given 2 minutes to complete the first part and 5 minutes for each one of second and third parts.

In the next phase of the study, the students who found the hidden figures in complex shapes got 1 point. Depending on the total scores they obtained, they were grouped as field dependent and field independent learners. Thus, taking 11 as cutoff point as mentioned earlier in section 3.3.1., the results of piloting revealed that of 80 students, 42 were field dependent and 38 were field independent learners.

The reliability of the test was established with a value of reliability coefficient using the Spearman-Brown formula. Based on this formula, the degree of the two halves of the test was checked for each participant to find whether the results of the halves are the same. Hence, the internal consistency of the test was estimated through the split-half reliability (Fraenkel & Wallen, 2009). On the basis of the reliability statistics, the correlation between forms was found .779. In addition, the Spearman-Brown coefficient was detected as .876 for equal length and .876 for unequal length (see Appendix E). In light of these findings of the pilot reliability test, the Turkish language version of the test in the current study was found to be reliable.

3.3.2. Learning Style Survey (LSS)

Learning Style Survey (LSS), developed by Cohen, Oxford and Chi in 2001, aims to reveal learners' learning style preference with the help of 11 categories consisting of 23 subcategories such as *visual, auditory, tactile/kinesthetic* (category 1); *extroverted, introverted* (category 2); *random-intuitive, concrete-sequential* (category 3); *closure-oriented, open* (category 4); *global, particular* (category 5); *synthesizing, analytic* (category 6); *sharpeners, levelers* (category 7); *deductive, inductive* (category 8); *field-independent, field-dependent* (category 9); *impulsive, reflective* (category 10); *metaphoric and literal* (category

11). Thus, to find the learners' learning style preference, the learners are required to answer 110 items. To give an example, in the survey, one of the categories is the 8th part that investigates how an individual deals with language rules. It should also be noted that this category is one of the focal points in the current study. This category consists of 6 items and 2 subcategories, i.e., based on an individual's answers to the first three and last 3 items, it can be detected whether they are deductive or inductive, respectively. Students indicate their answers on a 5-point likert scale, i.e., (0) never, (1) rarely, (2) sometimes, (3) often and (4) always.

It is significant to note that 11 categories are independent from each other. From this perspective, the points of each category are analyzed separately. In this sense, there is not a total point in the survey. Considering this fact, in order to establish the construct validity, factor analysis was performed by Cesur (2008) and Cesur and Fer (2009) to detect the relationship between the observed and latent variables. The results of the factor analysis for the survey consisting of 110 items reveal that the variances are between .45 and .74. In addition to that, based on the test re-test results, the reliability for subcategories of LSS with 110 items are displayed as .61 and .57 for deductive and inductive subcategories, respectively. The item-total correlations of 110 items for deductive subcategory are stated as .24-.38 while for the inductive one are displayed as .07-.35. Additionally, with respect to 70 items LSS item-total correlations, the reliability for deductive subcategory with 70 items is established as .21-.38 and the reliability for inductive subcategory is stated as .30-.30 (Cesur, 2008; Cesur & Fer, 2009).

As for the analysis of each category, the total point in each subcategory is divided by the item number in that subcategory. In addition, to group the learners according to their learning style, the highest number in a subcategory is taken into account (Cesur, 2008). For instance, taking the 8th category in the 52-item-LSS into account, to detect whether someone

is deductive, the first three items are checked. If they indicate all their answers as 4 which means always, the total point they obtain is 12. As a next step, the number 12 is divided by 3, the total item number in that subcategory. As for the inductive subcategory, the last two items are taken into consideration. The answers to each item are checked and the obtained total point is divided by 2. Lastly, the points of two subcategories are compared to find whether an individual is deductive or inductive. The subcategory with the highest point determines if the person is deductive or inductive, i.e. if the highest point is in the deductive subcategory, someone can be regarded as deductive learner.

In the current study, The Turkish language version of LSS developed by Cesur (2008) (see Appendix F) was used after getting permission (see Appendix G). Cesur started the process by asking five English teachers to translate the survey into Turkish. Then, five different English teachers back translated the Turkish language version into English. Lastly, the original survey was compared with the translated and back translated versions of the survey by a native speaker of English and two English teachers. As a result, it was found that there was not a significant difference between the original and the back translated versions of the surveys. Besides, Pearson's correlations between the Turkish and English language versions of the survey showed that the average correlation of all categories was .64 with a significance level at .01, thus establishing acceptable reliability and language equivalence. When it comes to the validity, factor analysis was used to determine the construct validity. Based on the factor analysis, the subcategories were determined as visual, auditory, extroverted, introverted, random, sequential, synthesizing, analytic, deductive, inductive, impulsive, reflective eliminating the other subcategories. As a result, the survey consisted of 6 categories, 12 subcategories and 52 items. Item-total correlations of the survey consisting of 52 items have been determined as .20-.45 with a significance level at .01 which shows the survey is reliable (Cesur, 2008; Cesur & Fer, 2009, 2011).

Since the validity and reliability of the Turkish language version of the test were established, the survey consisting of 52 items was taken into account in this study. However, considering the purposes of the study, as can be seen in the appendix F, only the 8th part with 5 items trying to reveal the learners' deductive-inductive learning style preferences was administered to the participants of the present study. The other parts of the instrument were eliminated.

The deductive-inductive learning style preferences of learners are determined with the help of the items 42, 43, 44, 45 and 46 in the 8th part of 52-item-LSS. Based on the internal reliability, the item-total correlations of these items are listed as .28 (for the item 42), .35 (for the item 43), .40 (for the item 44), .43 (for the item 45) and .28 (for the item 46) (Cesur, 2008; Cesur & Fer, 2009). These items correspond with items 89, 90, 91, 92 and 94 in the original instrument.

3.4. Data analysis

In order to answer the research question 1a, the scores obtained through the GEFT were calculated. As stated in section 3.3.1, since the second and the third parts in the test consisted of 18 items and the scores ranged from 0 to 18, the sum of the scores determined the cognitive level of FDI. In light of Abraham's (1985) study, the grouping of learners was determined based on the cutoff score of 11. Additionally, descriptive statistics were run. At first, descriptive statistics were used to obtain the number of the participants, the values of the range, the mean, the standard deviation, the variance and both the minimum and the maximum scores of GEFT. Secondly, to categorize the cognitive styles as field dependent and field independent in each vocational program, a crosstabulation was formed. As a result, the data was grouped revealing the number of the participants for both programs.

To answer the research question 2a and reveal the learners' preference for deductive or inductive way of learning, the learners' answers were summed up in each subcategory, and divided by the item number in that subcategory, as explained earlier. Descriptive statistics were used to reveal the number of the participants, the values of the range, the mean, the standard deviation, the variance, the minimum and the maximum scores of LSS both for deductive and inductive data. A crosstabulation was also used to categorize the cognitive styles and learning style preferences.

Prior to the analysis of the data to answer the other questions of the study, the data was checked for normal distribution through Kolmogorov-Smirnov test using SPSS Statistics 22 software. Since the number of the participants who took the GEFT and the LSS was 169, which was higher than 50, the Kolmogorov-Smirnov test was decided to be used for normality check (Bursal, 2019). Data obtained through the GEFT was found not to be normally distributed with a significance value of $p=,000$ ($p<,05$). Similarly, the data obtained through the LSS was not normally distributed with a significance value of $p=,000$ ($p<,05$) (both the deductive and inductive data), either. Therefore, non-parametric tests were decided to be used (Bursal, 2019; Dörnyei, 2007).

In order to answer whether there is significant relation between FDI cognitive style of learners and the types of programs (research question 1b) and the learning style preferences of learners and the types of programs (research question 2b), the chi-square test was used. As Dörnyei (2007) and Fraenkel and Wallen (2009) state, this test is suitable both for nominal data and the data which is not normally distributed. As for the present study, vocational programs (chemical technologies and child development-education), cognitive styles (field dependent and field independent) and learning styles (deductive and inductive) can be considered as the nominal data. To this end, the chi-square test was used not only to categorize the vocational programs, the cognitive styles and learning style preferences but

also to find how related the learners' cognitive styles and preferences for a learning style to their vocational programs.

As for the third research question that investigates the relation between FDI and the deductive-inductive learning style preferences of learners in two different vocational programs, the phi correlation coefficient (ϕ) was used. The reasons for that vary. First, the phi correlation coefficient is a non-parametric test. Second, the test is used to analyze the association between two variables. Third, it deals with categorical, nominal data (Bursal, 2019). Considering the current study, for both the GEFT and the LSS, the data is not normally distributed. Additionally, the third research question explores the association between two variables, the cognitive styles and learning style preferences, which are categorical (i.e., field dependent and field independent; deductive and inductive).

CHAPTER IV

RESULTS

The present study investigates the relationships among the 11th grade EFL learners' vocational programs, cognitive styles and learning style preferences. For this reason, the participants were administered two separate tests, namely the GEFT and the LSS.

The analysis of the data revealed the cognitive styles, the relation between the learners' cognitive styles and the types of the programs, learning style preferences, the relation between the learners' learning style preferences and the types of the programs, and the relation between the cognitive styles and the learning style preferences.

4.1. Research Question 1: Cognitive Style Results

The research question 1a attempts to find what kind of a cognitive style 11th grade EFL learners studying at chemical technologies and child development-education programs in a Vocational and Technical Anatolian High School have in terms of FDI.

To this end, as mentioned earlier in the data collection instruments and data analysis sections, the students' cognitive styles were detected through the GEFT. In an effort to group the learners as field dependent and field independent, this test was administered to all learners in both programs. The test scores of the GEFT obtained by the learners studying at chemical technologies and child development-education programs are shown in the following table.

Table 1

Descriptive Statistics of the GEFT Scores of 11th Grade EFL Learners Studying at Chemical Technologies and Child Development-Education Programs

| | | N | Range | Min. | Max. | Mean | Std. De. | Vari. |
|----------|--------------|-----|-------|------|------|------|----------|--------|
| Group | Chemical | 90 | 16 | 0 | 16 | 8,83 | 4,275 | 18,275 |
| | Technologies | | | | | | | |
| Embedded | Child | 79 | 18 | 0 | 18 | 7,42 | 4,156 | 17,272 |
| | Development- | | | | | | | |
| Test | Education | 169 | 18 | 0 | 18 | 8,17 | 4,266 | 18,203 |
| | Total | | | | | | | |

Table 1 shows that in chemical technologies program, the mean score is 8,83, the standard deviation is 4,275 and the variance is 18,275. In child development-education program, the mean score is 7,42, the standard deviation is 4,156 and the variance is 17,272.

In the follow-up phase of the study, based on the GEFT scores, the students in each program were determined as field dependent and field independent. Table 2 shows the crosstabulation illustrating the cognitive styles of 11th grade EFL learners studying at chemical technologies and child development-education programs.

Table 2

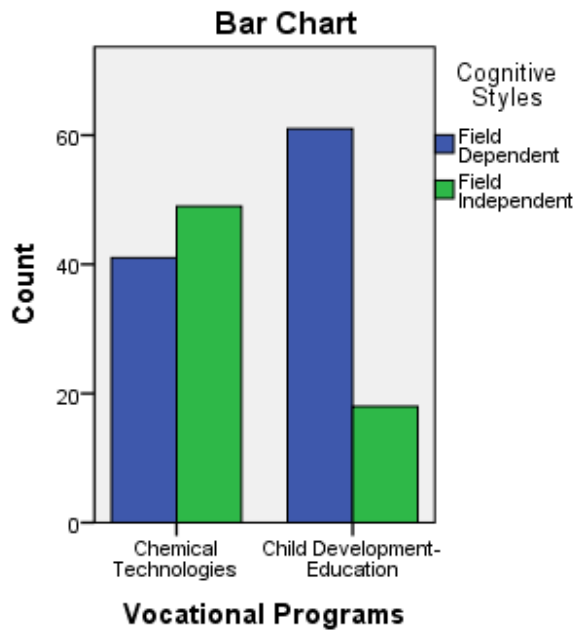
Cognitive Styles of 11th Grade EFL Learners Studying at Chemical Technologies and Child Development-Education Programs

| Vocational Programs * Cognitive Styles Crosstabulation | | | | | | | |
|--|-----------------------------|------------------|-------|-------------------|-------|-------|--------|
| | | Cognitive Styles | | | | | |
| | | Field Dependent | | Field Independent | | Total | |
| | | N | % | N | % | N | % |
| Vocational Programs | Chemical Technologies | 41 | 45,6% | 49 | 54,5% | 90 | 100,0% |
| | Child Development-Education | 61 | 77,2% | 18 | 22,8% | 79 | 100,0% |
| Total | | 102 | 60,4% | 67 | 39,6% | 169 | 100,0% |

Table 2 shows that 45,6% (N=41) of 90 students in chemical technologies program are field dependent and 54,4% (N=49) of them are field independent whereas, of 79 students in the child development-education program, 77,2% (N=61) are field dependent and 22,8% (N=18) are field independent. The findings are also illustrated in Figure 1.

Figure 1

Bar Graph of Cognitive Styles of 11th Grade EFL Learners Studying at Chemical Technologies and Child Development-Education Programs



As seen in Figure 1, the students in chemical technologies program are more likely to be field independent when compared with the students who are more likely to be field dependent in child development-education program. In order to see if there is a significant relation between FDI of students and their choice of vocational programs, the chi-square test was used (research question 1b) and the results were displayed in Table 3.

Table 3

The Chi-Square Test of Cognitive Styles of 11th Grade EFL Learners Studying at Chemical Technologies and Child Development-Education Programs

| Chi-Square Tests | | | | | |
|------------------------------------|---------------------|----|-----------------------|----------------------|----------------------|
| | Value | Df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
| Pearson Chi-Square | 17,624 ^a | 1 | ,000 | | |
| Continuity Correction ^b | 16,325 | 1 | ,000 | | |
| Likelihood Ratio | 18,135 | 1 | ,000 | | |
| Fisher's Exact Test | | | | ,000 | ,000 |
| Linear-by-Linear Association | 17,519 | 1 | ,000 | | |
| N of Valid Cases | 169 | | | | |

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 31,32.

b. Computed only for a 2x2 table

As seen in Table 3, the findings of the chi-square analysis reveal that vocational programs and the cognitive styles of the learners are related to each other in such a way that there is a significant relation between students' FDI and their choice of vocational programs ($\chi^2 (1, N = 169) = 16,325; p = ,00$) $p < ,05$. In other words, the students in chemical technologies program are significantly more field independent, while those in the child development-education program are significantly more field dependent.

4.2. Research Question 2: Learning Style Preference Results

The research question 2a examines the learning style preferences of field dependent and field independent 11th grade EFL learners at chemical technologies and child development-education programs.

The data obtained through the LSS by 169 students revealed a mean score of 2,43 ($SD = ,90$) on the deductive statements and a mean score of 2,57 ($SD = ,98$) on the inductive statements of the instrument.

The following table shows the crosstabulated distribution of the learning style preferences of field dependent and field independent learners in both programs.

Table 4

Learning Style Preferences of Field Dependent and Independent 11th Grade EFL Learners

| | | Cognitive Styles * Learning Style Preferences Crosstabulation | | | | | |
|-------------------|--|---|-------|-----------|-------|-------|--------|
| | | Learning Style Preferences | | | | | |
| Cognitive Styles | | Deductive | | Inductive | | Total | |
| | | N | % | N | % | N | % |
| Field Dependent | | 33 | 32,4% | 69 | 67,6% | 102 | 60,3% |
| Field Independent | | 35 | 52,2% | 32 | 47,8% | 67 | 39,7% |
| Total | | 68 | 40,2% | 101 | 59,8% | 169 | 100,0% |

Table 4 shows the number and the percentage of field dependent and field independent learners who preferred deductive and inductive learning styles in both programs. It is clear that in total, there are 102 field dependent and 67 field independent learners. As also seen in Table 4, 32,4% (N=33) of field dependent learners prefer deductive and 67,6% (N=69) of them prefer inductive learning styles. As for field independent learners, 52,2% (N=35) of them indicate their learning style as deductive whereas 47,8% (N=101) of field independent learners are in favor of inductive learning style. Additionally, 40,2% (N=68) and 59,8% (N=101) of all learners express their preferences for deductive and inductive learning styles, respectively. This finding suggests that the majority of the students are field dependent and prefer inductive learning style.

Table 5 and Table 6 illustrate the distribution of students' cognitive styles and learning style preferences according to the programs.

Table 5

Learning Style Preferences of Field Dependent and Independent 11th Grade EFL Learners Studying at Chemical Technologies Program

| | | Learning Style Preferences | | | | | |
|-------------------|----|----------------------------|----|-----------|----|--------|----|
| | | Deductive | | Inductive | | Total | |
| Cognitive Styles | | N | % | N | % | N | % |
| | | Field Dependent | 14 | 34,1% | 27 | 65,9% | 41 |
| Field Independent | 27 | 55,1% | 22 | 44,9% | 49 | 54,4% | |
| Total | 41 | 45,6% | 49 | 54,4% | 90 | 100,0% | |

Table 5 illustrates the learning style preferences of field dependent and field independent learners studying at chemical technologies program. Of a total of 90 students in this program, 54,4% (N=49) was found to be field independent while 45,6% (N=41) was field dependent learners. Of 49 field independent learners, 55,1% (N=27) had deductive while 44,9% (N=22) had inductive style of learning. Of 41 field dependent learners, 65,9% (N=27) had inductive, 34,1% (N=14) had deductive learning style preference.

These findings suggest that the majority of students in chemical technologies program are field independent learners, and that the majority of field independent learners prefer deductive learning style while the majority of field dependent learners prefer inductive learning style.

This finding is illustrated in figure 2 as well.

Figure 2

Bar Graph of Learning Style Preferences of Field Dependent and Independent 11th Grade EFL Learners Studying at Chemical Technologies Program

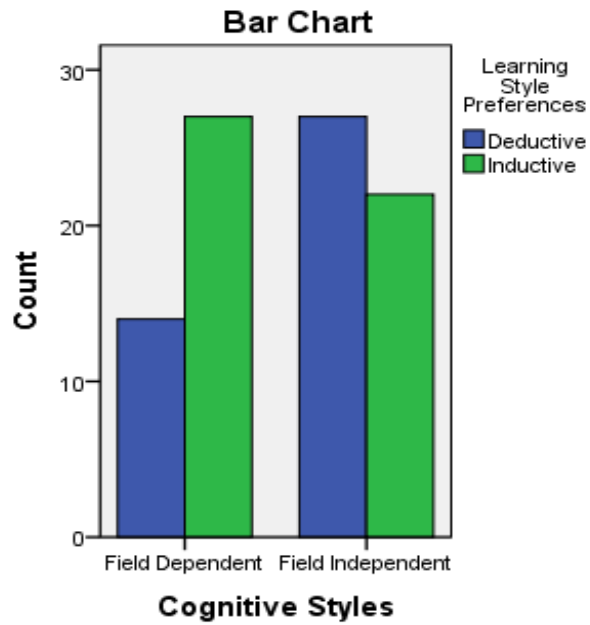


Table 6

Learning Style Preferences of Field Dependent and Independent 11th Grade EFL Learners Studying at Child Development-Education Program

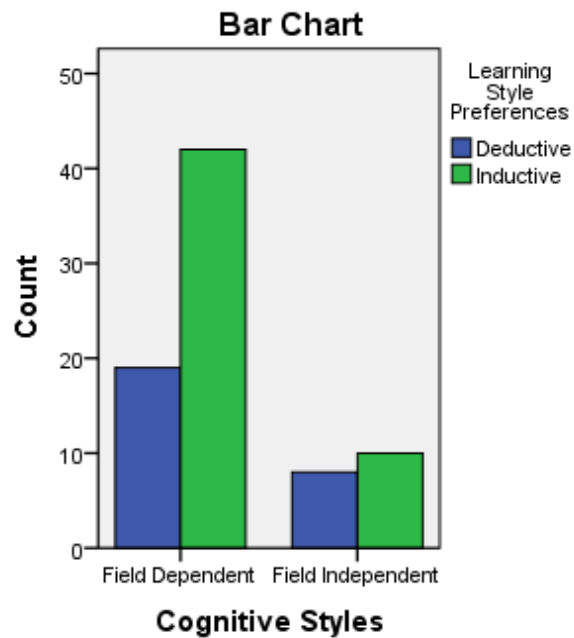
| Cognitive Styles * Learning Style Preferences Crosstabulation | | | | | | | |
|---|-------------------|----------------------------|-------|-----------|-------|-------|--------|
| | | Learning Style Preferences | | | | | |
| | | Deductive | | Inductive | | Total | |
| | | N | % | N | % | N | % |
| Cognitive Styles | Field Dependent | 19 | 31,1% | 42 | 68,9% | 61 | 77,2% |
| | Field Independent | 8 | 44,4% | 10 | 55,6% | 18 | 22,8% |
| Total | | 27 | 34,2% | 52 | 65,8% | 79 | 100,0% |

Table 6 shows the learning style preferences of field dependent and field independent learners studying at child development-education program. Of a total of 79 students in this program, 77,2% (N=61) was found to be field dependent whereas 22,8% (N=18) was field independent learners. Of 61 field dependent learners, 68,9% (N=42) had inductive while 31,1% (N=19) had deductive style of learning. Of 18 field independent learners, 55,6% (N=10) had inductive, 44,4% (N=8) had deductive learning style preference.

These findings suggest that the majority of students in child development-education program are field dependent learners, and that the majority of field dependent learners prefer inductive learning style. The majority of field independent learners prefer inductive learning style as well (see Figure 3).

Figure 3

Bar Graph of Learning Style Preferences of Field Dependent and Independent 11th Grade EFL Learners Studying at Child Development-Education Program



In order to see how the learners' learning style preferences were related to their vocational programs, (the research question 2b), the chi-square analysis was run and the results were displayed in Table 7.

Table 7

The Chi-Square Test of Learning Style Preferences of 11th Grade EFL Learners Studying at Chemical Technologies and Child Development-Education Programs

| Chi-Square Tests | | | | | |
|------------------------------------|--------------------|----|-----------------------|----------------------|----------------------|
| | Value | Df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
| Pearson Chi-Square | 2,265 ^a | 1 | ,132 | | |
| Continuity Correction ^b | 1,817 | 1 | ,178 | | |
| Likelihood Ratio | 2,276 | 1 | ,131 | | |
| Fisher's Exact Test | | | | ,158 | ,089 |
| Linear-by-Linear Association | 2,252 | 1 | ,133 | | |
| N of Valid Cases | 169 | | | | |

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 31,79.

b. Computed only for a 2x2 table

The findings of the chi-square analysis revealed no significant relation between the learning style preferences of learners and the types of the vocational programs ($\chi^2 (1, N = 169) = 1,817; p = ,178$) $p > ,05$.

4.3. Research Question 3: The Relation between the Cognitive Styles and Learning Style Preferences Results

The last research question attempts to find whether there is a significant relation between the cognitive styles and learning style preferences of 11th grade EFL learners studying at chemical technologies and child development-education programs in a Vocational and Technical Anatolian High School. To answer this question, the phi correlation coefficient (phi), a non-parametric test, was used in order to analyze the association between two categorical variables (i.e., cognitive styles: field dependent-field independent; learning styles preferences: deductive-inductive). Table 8 shows the results of the phi correlation coefficient.

Table 8

The Relation between the Cognitive Styles and Learning Style Preferences of 11th Grade EFL Learners Studying at Chemical Technologies and Child Development-Education Programs

| Cognitive Styles * Learning Style Preferences Crosstabulation | | | | |
|---|-------------------|----------------------------|-----------|-------|
| Count | | Learning Style Preferences | | |
| | | Deductive | Inductive | Total |
| Cognitive Styles | Field Dependent | 33 | 69 | 102 |
| | Field Independent | 35 | 32 | 67 |
| Total | | 68 | 101 | 169 |

| Symmetric Measures | | | | |
|--------------------|------------|-------|--------------|--|
| | | Value | Approx. Sig. | |
| Nominal by Nominal | Phi | -,198 | ,010 | |
| | Cramer's V | ,198 | ,010 | |
| N of Valid Cases | | 169 | | |

As Table 8 illustrates, the approximate significance value for the Phi is ,010 ($p < ,05$), which suggests that there is a significant relation between the cognitive styles and the learning style preferences of the learners ($\phi = -,198$; $p = ,010$).

CHAPTER V

DISCUSSION & CONCLUSION

This chapter briefly summarizes the study and sheds light on the discussion of the findings considering the related literature. Besides, it clarifies the implications and the limitations along with the recommendations for future research.

5.1. Summary

Cognitive and learning styles are the focal points of the present study. As mentioned earlier in the literature review part, FDI, known one of the most important cognitive styles, continues to be of interest in various studies. As for learning styles, deductive and inductive concepts have been examined especially in terms of deductive-inductive instructions. On the other hand, the relationship between FDI and deductive-inductive learning styles has not been explored enough. Additionally, the questions whether FDI affects the vocational choices and whether there is a relation between learners' preference for deductive/inductive learning style and vocational programs have been unexplored.

Considering the Turkish EFL studies, to the best of my knowledge, there is only one study examining the relationship between FDI and deductive-inductive instructions. Since further research is needed to explore how FDI is related to various issues such as vocational programs and learning style preferences and to find the relationships among these issues, the current study was conducted.

For the purpose of the study, the research questions were formulated to find the cognitive styles, learning styles preferences and the relation between the cognitive styles and learning styles preferences of learners. It should also be noted that how the cognitive styles and the learning style preferences of learners were related to their vocational programs were

also determined. To gather data, the GEFT and the LSS were administered to 169 Turkish, female students at grade 11, i.e., 90 students were studying at chemical technologies and 79 students were at child development-education programs in a Vocational and Technical Anatolian High School.

After analyzing the data with the help of descriptive statistics, the chi-square test and the phi correlation coefficient (ϕ), it was found that the students studying at chemical technologies program were significantly more field independent while the students studying at child development-education program were significantly more field dependent. Considering both programs, the EFL learners were found to be field dependent. More importantly, it was also found that there was a significant relation between FDI of learners and their choice of vocational programs. As for the learning style preferences, it was detected that in the chemical technologies program, field dependent learners mainly preferred inductive learning while field independent learners preferred deductive learning. On the other hand, in the other vocational program, both the field dependent and field independent learners mostly preferred inductive learning. Considering the learners in both groups as whole, inductive learning style was found to be mostly preferred one. As another finding, there was not a significant relation between the learners' learning style preferences and their vocational programs. Lastly, a significant relation between the learners' cognitive styles and learning style preferences was found. The findings are discussed below.

5.2. Discussion of the Key Findings

Cognitive styles, especially FDI, play such an important role in people's lives that these styles can even affect their decisions on a profession or program (Claxton & Murrell, 1987; Hoffman, 1997; Pithers, 2002; Witkin et al., 1977). That is why Hoffman (1997)

reminds how significant considering the cognitive style of FDI in relation with academic and vocational choices.

From a different point of view, Abraham (1985) and Hoffman (1997) underline the fact that cognitive styles should also be taken into account prior to regarding a teaching approach as effective or preferable. As Abraham (1985), Alptekin and Atakan (1990), Carter (1988) and Hoffman (1997) highlight the issue, field independence, for example, predominantly plays a crucial role where the teaching is achieved especially through deductive way.

Discussion of the Research Question 1: Cognitive Style Results

The first research question tried to investigate the cognitive styles of the EFL learners studying at two different vocational programs (research question 1a) and the relation between FDI cognitive style of learners and the types of programs (research question 1b). The results of the research question 1a revealed that the EFL learners studying at chemical technologies program were mainly field independent whereas the EFL learners studying at child development-education program were mainly field dependent. When the learners were considered as whole, on the other hand, their cognitive style of FDI was detected as field dependent. As for the research question 1b, a significant relation between FDI of learners and the vocational programs was also determined. In doing so, the findings of the study supported the relation between the cognitive styles and vocational programs. In this sense, it comes as no surprise that the learners' cognitive styles are thought to affect their educational and vocational choices (Claxton & Murrell, 1987; Hansen and Stansfield, 1982; Hoffman, 1997; Pithers, 2002; Witkin et al., 1977).

These findings suggest that the learners dealing with science-related subjects are more field independent while the learners dealing with human and education-related subjects are

more field dependent. Additionally, the results imply that since the learners at chemical technologies program are more field independent, they can analyze and solve the problems as expected. That is why they might be a scientist or a mathematician in their future career (Hansen & Stansfield, 1982; Witkin et al., 1977). As for the learners at the child development-education program, due to their being significantly more field dependent, they enjoy collaborative learning (Jamieson, 1992; Skehan, 1991). So, social activities reveal, in fact, how much being a teacher or dealing with people appeal to field dependent learners (Hansen & Stansfield, 1982; Witkin et al., 1977). All these issues are also in line with what Hansen and Stansfield (1982) and Witkin et al. (1977) emphasize. They state that people having a cognitive style of field dependence generally deal with sociology, education and teaching at an elementary school whereas people having a cognitive style of field independence tend to study science, mathematics, engineering and architecture.

These findings could also explain the difference between the field dependent and field independent EFL learners when vocational programs are concerned. That is, when FDI is examined considering two or more groups, the group members are more likely to be called field dependent or vice versa. Inevitably, this situation leads to a difference between/among the groups. In the current study, FDI cognitive style of EFL learners was investigated in two different vocational programs. In this sense, the findings related to FDI were analyzed separately. Note, however, that when the learners were examined as a whole without focusing on the vocational programs, the findings revealed that the EFL learners were mainly field dependent. So, discussing the findings considering the groups of the learners as well as the EFL/ESL contexts would provide a different point of view.

The studies in the field of SLL that examined FDI in different groups of people can be listed as Hansen (1984), Johnson et al. (2000), Meguro (2020) and Yeldham and Gao (2021). They explored FDI in different groups similar to the present study which conducted research

with chemical technologies and child development-education programs. What made their study different from the current study was that they studied in the context of ESL. In addition to this difference, they formed groups related to cultures, genders or teaching techniques but not on the vocational programs.

As an example, in the study of Hansen (1984), six different cultures such as Samoan, Tongan, Tahitian, Fijian, Indian-Fijian, and Hawaiian were taken into consideration in order to evaluate FDI among different cultures. In addition to the cultural groups, gender was also considered to group the learners. As one of the results of the study, among the cultures, the Hawaii ESL learners were found to be significantly more field independent. Among all the cultures, the male students were found significantly more field independent than the females. When it comes to the ESL context, the learners' performance was found to be affected by the cognitive style of field independence. Although Jamieson (1992) did not group the learners, the findings of the study conducted with ESL learners were in line with Hansen (1984). In other words, field independence was found to be related with ESL proficiency. The study conducted by Johnson et al. (2000) also examined the ESL learners in two groups as the ESL group and the group of native English speakers. Comparing these groups revealed that field dependent learners in ESL group were better at SLL. In the study of Meguro (2020), FDI was explored grouping the ESL learners in terms of analogical reasoning. That is, field independent students with higher analogical reasoning were found to be better at SLL. Lastly, Yeldham and Gao (2021) investigated FDI in ESL context forming two groups as strategy instruction class and interactive class. As the findings indicated, field dependent learners benefited much more from the strategy instruction class adopting top-down approach. Similar to the current study in terms of EFL context, Alptekin and Atakan (1990) and Köse (2018) examined FDI in their studies. Both studies revealed that field independent learners were more successful in language learning. When the present study is concerned, the

majority of the learners were found to be field dependent. However, it does not show that these learners are also better at language learning since the current study did not explore the learners' academic achievement in learning a language. So, this fact serves as a distinctive of the findings. As these studies suggest, different groups of people can have different cognitive style of FDI and this difference can affect their educational or vocational choices and even success in learning a language.

Except for the studies in EFL/ESL context, it is significant to mention the studies on FDI in other fields such as chemistry and child career and development due to the fact that in the current study, EFL learners specialize in the field of chemistry and child development-education. It is evident that the results of the present study are in line with the findings of the studies of Daines (1977), Danili and Reid (2004), Frank (1986) and Özarıslan and Bilgin (2016). Conducting a study with the students at the child career and development programs, Daines (1977) proved the fact that the students were predominantly field dependent. Danili and Reid (2004) studied with chemistry students. Their study revealed that field independent learners were more successful in chemistry when compared to field dependent learners. The study of Frank (1986) was carried out at the teacher education program. The result of the study was that the learners studying at natural sciences, mathematics and business were more field independent than the learners at other areas such as family/child development, home economics and physical education. As Özarıslan and Bilgin (2016) also found, field independent learners studying science were more successful than field dependent learners at the time of acquiring the nature of matter concepts.

On the basis of the literature, it may be concluded in general that exploring FDI in different groups of learners can reveal a high probability of learners' having a different FDI cognitive style. Additionally, the students dealing with chemistry can be regarded as field independent while the students dealing with child development-education can be regarded as

field dependent. Lastly, since the learners dealing with science-related subjects were generally found field independent and the learners studying subjects such as child development were considered field dependent, cognitive styles can be regarded as the robust factor affecting the learners' field of specialization.

Discussion of the Research Question 2: Learning Style Preference Results

The present study also investigated the learning style preferences of field dependent and field independent learners (research question 2a) and the relation between their preferences and vocational programs (research question 2b). The findings of the research question 2a were that in chemical technologies program, field dependent learners generally preferred inductive learning while field independent learners mainly preferred deductive learning. In child development-education program, both the field dependent and field independent learners mainly preferred inductive learning. When both programs were concerned, EFL learners generally preferred inductive learning style. On the other hand, the research question 2b indicated that there was not a significant relation between the learning style preferences and the vocational programs of the learners.

It is significant to note that the literature lacks research investigating the learning style preferences of the field dependent/independent learners specializing in a field such as chemistry and education. Nevertheless, there are few studies in the field of language revealing the learners' learning style preferences although the learners are not studying chemistry or child development. These studies correspond with the current study in terms of exploring the learners' learning style preference in EFL context. One of these studies was conducted by Nešić and Hamidović (2015). They found that the majority of the EFL learners preferred deductive approach, opposite to the finding of the current study. Likewise, Arifin (2016) studied with EFL learners. The study suggested that deductive group was more

successful due to the fact that deductive approach enabled the students to easily learn what they were required. Similarly, the study of Nur (2020) was conducted with EFL learners. One of the findings was that all of the learners in the deductive group preferred deductive learning. The other result was that the majority of the learners in the inductive group preferred inductive way of learning.

Due to the limited research on language context, i.e., ESL or EFL, it is significant to state the studies on deductive-inductive learning styles in other fields such as Cardino Jr and Cruz (2020), Dameus et al. (2004), Jalil (2006), Oliver-Hoyo and Allen (2005) and Nuhoglu (2020). The study in the context of mathematics conducted by Cardino Jr and Cruz (2020) indicated that the learners' mathematics performance was heavily affected by the deductive and inductive approaches. In the context of agricultural economics, as Dameus et al. (2004) reported, the learners were found to be more successful when taught inductively. The finding of Dameus et al. (2004) is also in line with the finding of the current study. As mentioned earlier, in the present study, both the field dependent and field independent learners studying at the child development-education program preferred inductive learning. The study of Jalil (2006) revealed how the students studying chemistry were keen on inductive learning. Similarly, Oliver-Hoyo and Allen (2005) studied with the learners studying chemistry. Their study showed that inductive learning aroused positive feeling in terms of learning chemistry. When it comes to the present study, only field dependent learners studying chemistry were in favor of inductive learning. Nuhoglu (2020) studied with the learners studying science as well. The students who used deductive method were better at the problem solving skills. Compared with the current study, only field independent learners studying chemistry preferred deductive learning.

All in all, it can be concluded that the learners' cognitive styles can be related to their preferences for deductive or inductive learning although the relation does not exist between their cognitive styles and vocational programs.

Discussion of Research Question 3: The Relation between the Cognitive Styles and Learning Style Preferences Results

As for the third research question, a significant relation was found between the learners' cognitive styles and learning style preferences. This finding suggests that the cognitive style of FDI can be linked to the deductive and inductive approaches when they act as learning styles. In the studies of Abraham (1985), Behçetoğulları (1992) and Wang (2012), FDI and deductive-inductive approaches were also explored. However, as opposed to the current study, especially Behçetoğulları (1992) and Wang (2012) supported that taking cognitive styles into account together with teaching methods may not affect learners' achievement in learning.

Although Abraham (1985) conducted research in ESL context and focused on the deductive and inductive approaches as teaching methods, the study corresponds with the current study. In the study of Abraham (1985), field independent learners were found to be more successful when taught deductively. Field dependent learners, on the other hand, were better at learning language with the help of inductive instruction. This finding can be regarded as similar to the finding of the current study when the learners studying at chemical technologies program and the students as a whole were concerned. In other words, in chemical technologies program, although the learners were not taught through deductive or inductive instruction, field dependent learners mainly preferred inductive learning while field independent learners preferred deductive learning. In addition, the students as whole were field dependent and preferred inductive learning style. These findings imply that whether the

learners were taught language deductively/inductively or not, field dependent learners can still prefer inductive learning style and field independent learners can prefer deductive one to learn a language. In the other vocational program, however, the findings contradict with such an implication. That is, in child development-education program, not only the field dependent but also the field independent learners mostly preferred inductive learning. In fact, this finding corresponds with the result indicating that there was not a significant relation between the learners' learning style preferences and their vocational programs.

In the study of Wang (2012), field dependent learners taught inductively outperformed field independent learners. Besides, field dependent learners in both deductive and inductive groups outperformed the field independent ones. Although this finding corresponds with the relation between the field dependent learners and inductive approach as in the current study and Abraham (1985), it indicates that there might be other variables other than cognitive styles. That is why Wang (2012) argues that establishing a relation between deductive-inductive approaches and FDI may not affect an individual's learning performance.

The other study that contradicts with the results of Abraham (1985), Wang (2012) and the current study is the study of Behçetoğulları (1992). Her study revealed that when taught not only deductively but also inductively, field independent learners were found to be more successful. The finding suggests that it may not work trying to establish a relation between cognitive styles and teaching/learning styles, similar to the implication of Wang (2012).

These implications of Behçetoğulları (1992) and Wang (2012) support the findings of Köse (2018). Despite the fact that Köse (2018) tried to explore FDI and learning styles other than deductive and inductive, i.e. visual, auditory and kinesthetic, he found that there was not a significant relation between FDI and learning style preferences of learners, as opposed to the present study revealing a significant relation between the learners' cognitive styles and learning style preferences. Although the results of the third research question contradict with

the explanations of Behçetoğulları (1992), Köse (2018) and Wang (2012), the findings suggest that the learners' FDI cognitive style may affect their learning style preferences. The findings also imply that the difference in field dependent and field independent learners' preferences in both programs may be explained by not the learners' being exposed to the deductive and inductive instructions.

5.3. Implications

On the basis of the results of the current study, offering various implications can contribute a lot to the fields of language acquisition and research. To begin with, FDI cognitive style of EFL learners studying at vocational and technical schools in order to specialize in a specific field can be examined. The significant relation between FDI cognitive style of learners and the types of programs suggests that determining FDI cognitive style can shed light on the learners' language learning in a program at vocational and technical schools. Hence, determining the learners' cognitive styles should be achieved in order to provide them with a variety of tasks. Since, the EFL teachers should also be aware of the fact that a language classroom may consist of both field dependent and field independent learners. Therefore, the necessary changes to the regulations should be made to present the most appropriate teaching/learning environment for EFL learners.

Secondly, on the condition that the learners' cognitive styles are detected, curriculum developers can rearrange the ways in which the language teaching and learning take place. For instance, they can guide the EFL teachers through the appropriate teaching materials or activities in their classrooms. In doing so, the teachers can plan a lesson that can be suitable for their learners. As an example, they can plan collaborative activities such as pair/group works, discussions and games for competition for field dependent learners. On the other hand, they can encourage field independent learners to analyze and solve a problem or do

experiments. Such rearrangements in curriculums and lesson plans would enable the learners to accomplish the learning objectives. The learners can become aware of their own strengths and weaknesses in terms of learning a foreign language as well.

Apart from these implications, the findings of the study imply that detecting not only the learners' cognitive styles but also the learning style preferences can facilitate language learning of EFL learners. Since the result on the association between the cognitive styles and deductive-inductive learning style preferences of EFL learners proves FDI cognitive styles' affecting preferences, curriculums and lessons plans can be rearranged based on this issue. For example, considering the field dependent learners' preference for inductive learning, these learners can be provided with the most appropriate activities or presentation of language learning, i.e., inductive approach. In this way, EFL teachers can create a very fruitful teaching/learning atmosphere and at the same time very enjoyable. Because, when the learners know about their cognitive and learning styles, they can also change their study habits in order to be more successful. The teachers can even change their testing styles and offer different measurement-evaluation techniques. For instance, field dependent learners who mostly prefer inductive learning can be asked to discover the grammar rules or the meaning of a vocabulary with the help of the specific examples given. Field independent learners who generally prefer deductive learning, on the other hand, can be asked to prepare a presentation on a specific topic stated in the list of the learning objectives.

Taking all these points into account, the analyses of cognitive styles and learning style preferences can make a big difference to the vocational and technical education. The teachers can rearrange the teaching/learning contexts or the measurement-evaluation techniques, the learners can become aware of the ways in which they can learn and language learning can be achieved through an easier and enjoyable way. So, it is worth the effort to

find what the EFL learners' cognitive styles and learning style preferences are in vocational and technical schools.

5.4. Limitations and Suggestions for Further Studies

The present study reveals some limitations that should be discussed in order to offer some recommendations for future research. To begin with, the sample size of the study can be regarded as one of the major limitations of the study. The study was limited to 169 participants for various reasons. First of all, only one school, which was a state, Vocational and Technical Anatolian High School in the Asian part of Istanbul, was selected for the research. Secondly, in this school, only two vocational programs, i.e., chemical technologies and child development-education, were included in the study. Lastly, the participants studying at these programs were 11th graders. Bearing these limitations in mind, for future studies, the sample size can be increased. In order to obtain larger sample size, all Vocational and Technical Anatolian High Schools, not only in Asian but also in European side of Istanbul can be included in the study. Additionally, various graders (e.g., 9th, 10th and 12th) studying at different vocational programs (e.g., information technologies, electrical and electronics technologies) can also be chosen as the participants.

The other limitation is the gender of the participants. Since the Vocational and Technical Anatolian High School in the current study accepted only female students, the participants were female learners. Future studies can determine the gender of the participants as both female and male. In this way, larger sample size can also be achieved.

The research method of the study is another limitation. The current study was conducted with quantitative research method. To this end, in order to detect the cognitive styles and the learning style preferences of the EFL learners, the GEFT and the LSS were used, respectively. Future research can also be conducted with a qualitative research design.

For example, with the help of an interview method, the learners can be required to answer questions and discuss on what their learning preferences are.

It should also be noted that, although the LSS consisted of 11 parts, only one part was used to determine learning style preferences which, in turn, only two learning styles, i.e., deductive and inductive, were detected in the present study. Using the LSS as a whole with all its parts, future research may examine a variety of learning style preferences (e.g., visual, auditory and tactile/ kinesthetic). Additionally, conducting a quantitative research method, only two cognitive styles such as field dependent and field independent were investigated. Further study should be conducted to detect various cognitive styles (e.g., holistic-analytic, reflective-impulsive).

The last limitation of the study is that field dependent and field independent learners of the study were only asked their deductive-inductive learning style preferences through a 5-item survey. One of the reasons is that the duration allocated for the data collection was 40 minutes. Secondly, the participants were required to answer not only the LSS but also the GEFT. Last but not least, in fact, the LSS consisted of 110 items, which was too long for the learners to answer in 40 minutes. More importantly, it was significant for Provincial Directorate of National Education not to prevent the learners from education. Thus, considering the permission of Provincial Directorate of National Education, the limited time to collect data and the feasibility of the research, the current study could not examine whether field dependent and field independent learners still preferred deductive or inductive learning when taught deductively or inductively. It would be better if future research was conducted to find whether field dependent or field independent learners still prefer deductive or inductive learning when presented language through a deductive or inductive approach. In light of these limitations and suggestions, further study can contribute a lot not only in the field of research but also education.

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Appendices

Appendix A

Parental Approval Form

İstanbul İl Milli Eğitim Müdürlüğünden izin alınarak kimya teknolojisi ve çocuk gelişimi-eğitimi alanlarındaki lise öğrencilerinin bilişsel stilleri ve tümdengelim-tümevarım öğrenme stilleri tercihleri arasında bir ilişki olup olmadığını saptamak için bir yüksek lisans tez çalışması yürütülmektedir.

Çalışmanın amacını gerçekleştirmek için öğrencinizden Saklı Şekiller Grup Testini ve Öğrenme Stilleri Anketini cevaplaması istenecektir. Bu çalışmaya katılım gönüllü olarak gerçekleştirilmektedir ve öğrenciniz bu ölçekleri tamamlamakta serbesttir. Öğrencinizin test ve ankete verdiği cevaplar gizli tutulacaktır ve araştırmacı tarafından değerlendirilip elde edilecek bilgiler bilimsel amaçlı yayımlarda kullanılacaktır.

Öğrencinizin bu çalışmaya katılımını onaylamak için lütfen bu formu imzalayınız.

Velisi olduğum öğrencimin 'İngilizceyi Yabancı Dil Olarak Öğrenen 11. sınıf Öğrencilerinin Mesleki Programları, Bilişsel Stilleri ve Öğrenme Stilleri Tercihleri Arasındaki İlişkinin İncelenmesi' konulu tez çalışması için uygulanacak olan Saklı Şekiller Grup Testine ve Öğrenme Stilleri Anketine katılmasına izin veriyorum.

Öğrencinin Velisi:

- Adı- Soyadı:
- İmza :

Appendix B

Volunteer Participation Form

Bu çalışma, bir yüksek lisans tez çalışmasıdır. Araştırmanın amacı, kimya teknolojisi ve çocuk gelişimi-eğitimi alanlarındaki lise öğrencilerinin bilişsel stilleri ve tümdengelim-tümevarım öğrenme stilleri tercihleri arasında bir ilişki olup olmadığını saptamaktır. Bu çalışma için İstanbul İl Milli Eğitim Müdürlüğünden izin alınmıştır. Çalışmaya katılım tamamıyla gönüllülük temelinde olmalıdır. Cevaplarınız tamamıyla gizli tutulacak ve sadece araştırmacılar tarafından değerlendirilecektir. Elde edilecek bilgiler bilimsel yayımlarda kullanılacaktır.

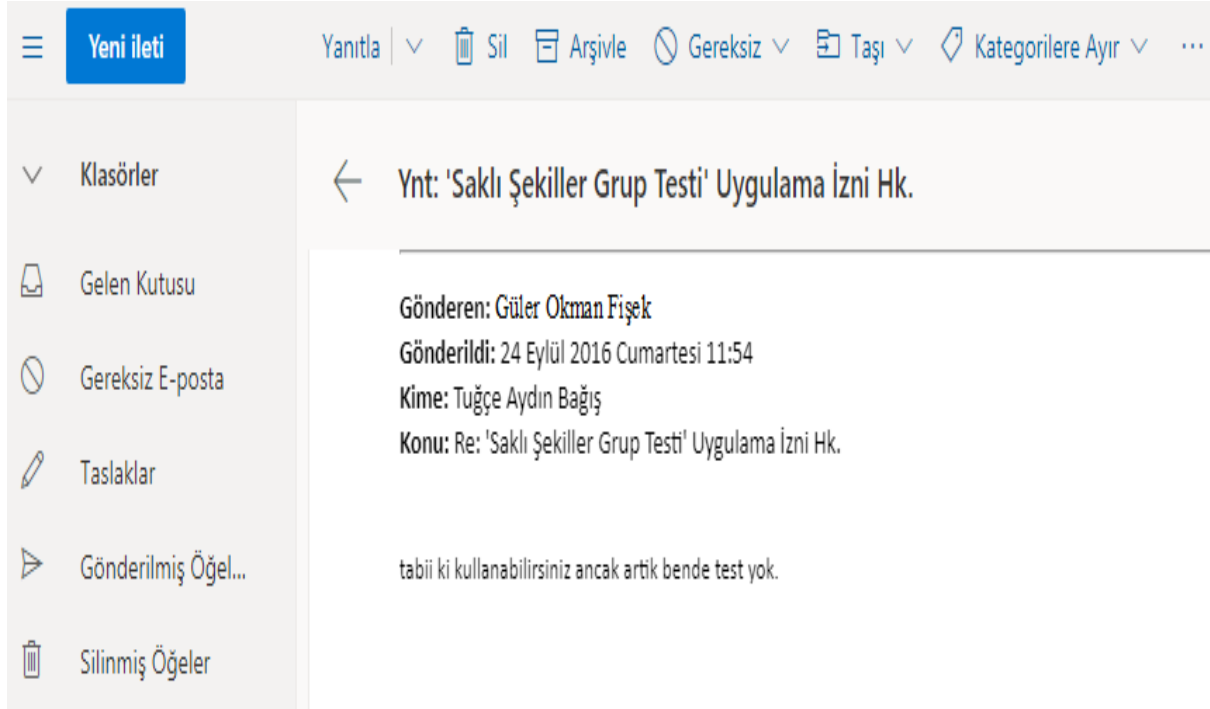
Ölçekler, genel olarak kişisel rahatsızlık verecek soruları içermemektedir. Ancak, katılım sırasında sorulardan ya da herhangi başka bir nedenden ötürü kendinizi rahatsız hissederseniz cevaplama işini yarıda bırakıp çıkmakta serbestsiniz. Böyle bir durumda çalışmayı yürüten kişiye, ölçeği tamamlamadığınızı söylemek yeterli olacaktır. Onay vermeden önce sormak isteyeceğiniz herhangi bir konu varsa sormaktan çekinmeyiniz. Bu çalışmaya katıldığınız için şimdiden teşekkür ederiz.

Bu bilgileri göz önüne alarak çalışmaya gönüllü olarak katıldığınızı ve verdiğiniz bilgilerin bilimsel amaçlı yayımlarda kullanılmasını kabul ettiğinizi belirtmek için lütfen aşağıdaki ifadede yer alan kutucuğu işaretleyiniz ve formu uygulayıcıya geri veriniz.

Bu çalışmaya tamamen gönüllü olarak katılıyorum ve istediğim zaman yarıda kesip çıkabileceğimi biliyorum. Verdiğim bilgilerin bilimsel amaçlı yayımlarda kullanılmasını kabul ediyorum.

Appendix C

The Permission for the Group Embedded Figures Test (GEFT)



The screenshot displays an email client interface. At the top, there is a navigation bar with a menu icon, a 'Yeni ileti' button, and several action icons: 'Yanıtla', 'Sil', 'Arşivle', 'Gereksiz', 'Taşı', and 'Kategorilere Ayır'. Below this is a sidebar with a list of folders: 'Klasörler', 'Gelen Kutusu', 'Gereksiz E-posta', 'Taslaklar', 'Gönderilmiş Öğel...', and 'Silinmiş Öğeler'. The main content area shows an email with the following details:

← Ynt: 'Saklı Şekiller Grup Testi' Uygulama İzni Hk.

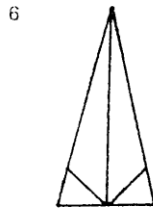
Gönderen: Güler Okman Fişek
Gönderildi: 24 Eylül 2016 Cumartesi 11:54
Kime: Tuğçe Aydın Bağış
Konu: Re: 'Saklı Şekiller Grup Testi' Uygulama İzni Hk.

tabii ki kullanabilirsiniz ancak artık bende test yok.

Appendix D

Samples of the Group Embedded Figures Test (GEFT)

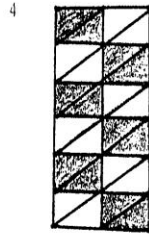
Sample D1: Sample Figure from the First Part (Practice Part):



Basit Şekil "F" yi Bulun

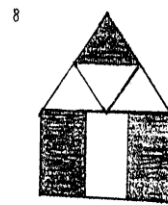
Identify the simple figure "F".

Sample D2: Sample Figures from the Second Part:



Basit Şekil "E" yi Bulun

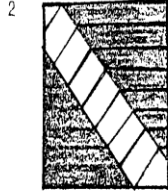
Identify the simple figure "E".



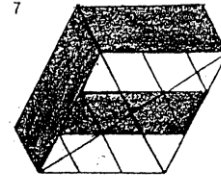
Basit Şekil "D" yi Bulun

Identify the simple figure "D".

Sample D3: Sample Figures from the Third Part:

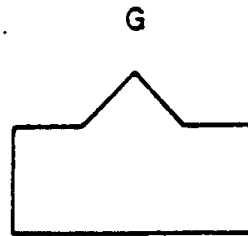
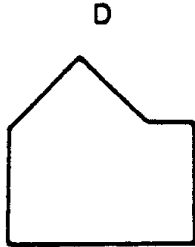


Basit Şekil "G" yi Bulun
Identify the simple figure "G".



Basit Şekil "A" yı Bulun
Identify the simple figure "A".

Sample D4: Samples of the Simple Figures:



Appendix E

The Reliability of the Pilot Group Embedded Figures Test (GEFT)

| Case Processing Summary | | | | |
|-------------------------|-----------------------|----|-------|--|
| | | N | % | |
| Cases | Valid | 80 | 100,0 | |
| | Excluded ^a | 0 | ,0 | |
| | Total | 80 | 100,0 | |

a. Listwise deletion based on all variables in the procedure.

| Reliability Statistics | | | |
|--------------------------------|------------------|------------|----------------|
| Cronbach's Alpha | Part 1 | Value | ,759 |
| | | N of Items | 9 ^a |
| | Part 2 | Value | ,734 |
| | | N of Items | 9 ^b |
| | Total N of Items | | 18 |
| Correlation Between Forms | | | ,779 |
| Spearman-Brown Coefficient | Equal Length | | ,876 |
| | Unequal Length | | ,876 |
| Guttman Split-Half Coefficient | | | ,872 |

a. The items are: Q1, Q3, Q5, Q7, Q9, Q11, Q13, Q15, Q17.

b. The items are: Q2, Q4, Q6, Q8, Q10, Q12, Q14, Q16, Q18.

| Scale Statistics | | | | |
|------------------|------|----------|----------------|----------------|
| | Mean | Variance | Std. Deviation | N of Items |
| Part 1 | 4,74 | 6,373 | 2,525 | 9 ^a |
| Part 2 | 4,81 | 4,964 | 2,228 | 9 ^b |
| Both Parts | 9,55 | 20,099 | 4,483 | 18 |

a. The items are: Q1, Q3, Q5, Q7, Q9, Q11, Q13, Q15, Q17.

b. The items are: Q2, Q4, Q6, Q8, Q10, Q12, Q14, Q16, Q18.

Appendix F

Learning Style Survey (LSS)

Öğrenme Stilleri Anketi (52 Maddelik):

Kendi Öğrenme Stillerinizi Değerlendirme

Öğrenme Stili Anketi sizin öğrenmeye genel yaklaşımınızı değerlendirmek amacıyla hazırlanmıştır. Bu anket, sizin her durumda nasıl davranacağınızı belirlemez, ancak genelde öğrenme stili tercihlerinizin açık bir göstergesidir. Her bir madde için, yaklaşımınızı gösteren şıkkı işaretleyiniz. Tüm maddeleri cevaplayınız. Bu araştırmada, oniki farklı öğrenme stilinizi gösteren onbir temel etkinlik yer almaktadır. Cümleleri okuduğunuzda, genelde öğrenirken yaptıklarınızı düşünmeye çalışınız. Anketi tamamlamak yaklaşık 20 dakika alır. Maddeler üzerinde düşünerek çok fazla zaman harcamayınız - o anki kanaatinizi işaretleyiniz ve bir sonraki maddeye geçiniz.

Her bir madde için, cevabınızı işaretleyiniz:

0 = Hiç

1 = Nadiren

2 = Bazen

3 = Sık sık

4 = Her zaman

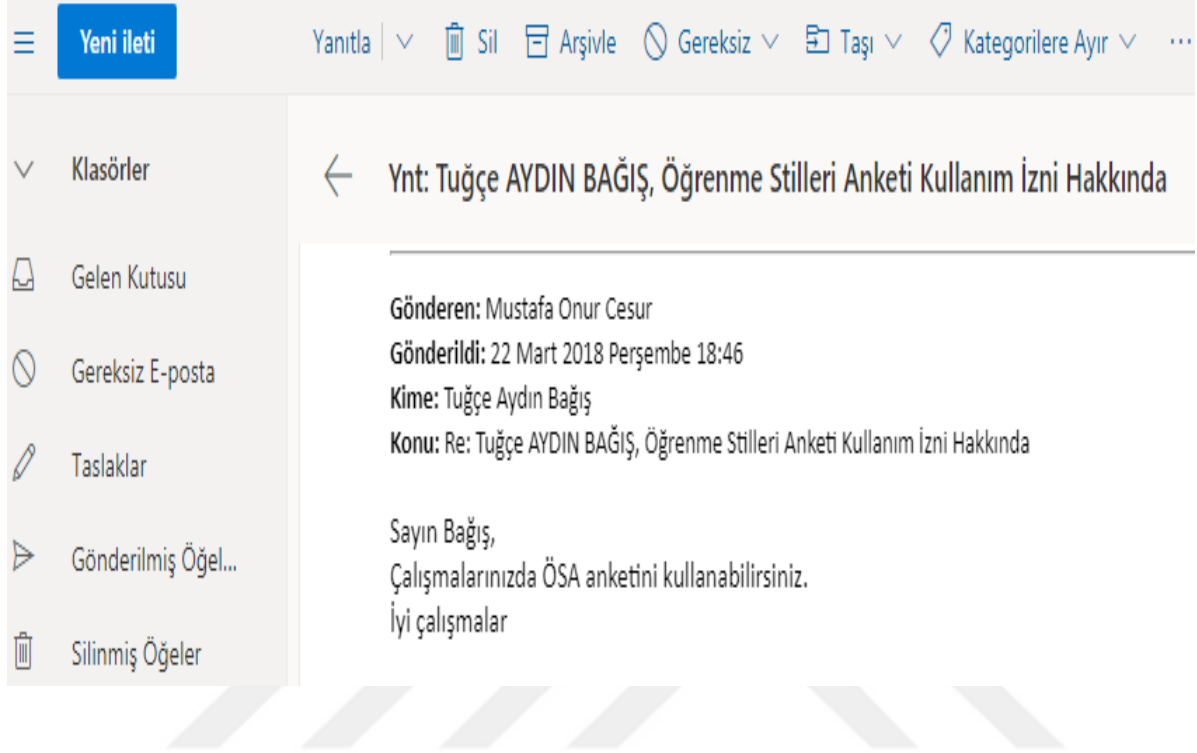
Bölüm 8: DİL KURALLARI İLE NASIL BAŞA ÇIKARIM

- | | |
|--|-----------|
| 1. Hedef dili öğrenirken, genel yapılardan özel örneklere doğru gitmeyi severim. | 0 1 2 3 4 |
| 2. Özel örneklerden çok, kurallar ve teorilerle başlamayı isterim. | 0 1 2 3 4 |
| 3. Genellemelerle başlamayı ve daha sonra bu genellemelerle ilgili deneyimler bulmayı severim. | 0 1 2 3 4 |
| 4. Dil kurallarını, dolaylı yoldan, verilen gramer örnekleri ve diğer dil unsurlarını içeren örneklerle öğrenmeyi severim. | 0 1 2 3 4 |
| 5. Zamanla, dil yapılarının işleme şeklini gözlemleyerek, kuralları keşfederim. | 0 1 2 3 4 |

(Öğrencilerin tümdengelim-tümevarım öğrenme stilleri tercihlerini belirleyen bu anket, Cohen, Oxford ve Chi (2001) tarafından geliştirilen Öğrenme Stilleri Anketinin, Cesur (2008) tarafından Türkçeye uyarlanmış versiyonudur.)

Appendix G

The Permission for the Learning Style Survey (LSS)



The screenshot displays an email client interface. On the left, there is a sidebar with a navigation menu including 'Yeni ileti', 'Klasörler', 'Gelen Kutusu', 'Gereksiz E-posta', 'Taslaklar', 'Gönderilmiş Öğel...', and 'Silinmiş Öğeler'. The main area shows an email with the following details:

Ynt: Tuğçe AYDIN BAĞIŞ, Öğrenme Stilleri Anketi Kullanım İzni Hakkında

Gönderen: Mustafa Onur Cesur
Gönderildi: 22 Mart 2018 Perşembe 18:46
Kime: Tuğçe Aydın Bağış
Konu: Re: Tuğçe AYDIN BAĞIŞ, Öğrenme Stilleri Anketi Kullanım İzni Hakkında

Sayın Bağış,
Çalışmalarınızda ÖSA anketini kullanabilirsiniz.
İyi çalışmalar