Exploring the Data-driven Approach to Grammar Instruction in the ELT Context of Turkey

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Abstract

This study aims at a rediscovery of the extent to which a Data Driven Learning (DDL)-based intervention could become instrumental in facilitating grammar instruction with a specific focus on English for Academic Purposes (EAP) and learner autonomy in a preparatory program comprised mostly of Turkish-L1 learners. It provides a context-restricted longitudinal depiction of the effectiveness of a DDL-based grammar instruction endorsed by teacher mentorship across groups asynchronously, thus re-testing the limits of DDL-oriented corpus pedagogy in contexts where a control group is not available. To this end, a corpus was compiled out of the existing reading and listening materials in use ad hoc as the Alternative Corpus of Academic Texts (ACAT), and a total of 19 grammar lessons covering topics in the curriculum of the second level of the grammar course were developed using the ACAT. Blind pre- and post-test procedures were administered with all four experimental groups independent of each other to gradually build up an understanding of the governing pattern of learner achievement through DDL and corpus-based teacher-prepared materials. The analysis demonstrated a rise in student achievement across all groups despite the lack of a teacher disseminating knowledge to students DDL-enhanced teaching. With the design being unorthodox, this study shows that the triple powers of DDL, self-discovery, occasional teacher supervision, in class in the traditional sense, thus showing that a sense of autonomy could be fostered through and corpus-based teaching materials, could help learners survive autonomously no matter how hectic the curriculum run at an institution is. Further research is needed to deepen this insight so that this sort of DDL practice could be implemented at an institutional level.

Keywords: EFL, EAP, data-driven learning, materials development, autonomous learning, classroom concordancing

Introduction

The use of technology in educational contexts where English is taught by non-native speakers are especially liable for research aiming at understanding the pedagogical effectiveness of technology in classrooms and the interaction between technology and learners, which constitutes the rationale for the study. English for Academic Purposes (EAP) instruction at preparatory schools of English as a Medium of Instruction (EMI) universities, which run a dense and relatively hectic curriculum, requires learners to take up much of the responsibility of their own learning through effective use of linguistic technology. When taught as discrete skills, EAP learning might turn out quite challenging for learners with a limited background in English. They may experience difficulties in using technology for autonomous learning (Condrat, 2014), have difficulty in participating in the academic community (Hyland and Hamp-Lyons, 2002), adjusting to the norms and expectations of the "perceived superiority" (Liyanage & Walker, 2014, p. 165) of English language that has an international status, and knowing the "lingua franca" status of English as a medium of global communication (Hyland & Hamp-Lyons, 2002; Jenkins, 2011; Seidlhofer, 2005), and so forth. These challenges might cause learners to distance themselves from the input provided by teachers, course books, or other teaching materials in the traditional sense, thus altering their attitude towards learning the target language by raising their affective filters (Krashen, 1981). Grammar instruction in an EAP context can therefore become less meaningful for learners, as each learner in a class might have different needs and pacing during different periods of teaching/learning even though they study the same content. This is especially true, concerning a heightened level of anxiety caused by intense input predominantly prescriptive grammar content that is based on goal-oriented norms and language structures governing what the students should or should not use during the classes. To overcome these challenges, there may be a need to increase the effectiveness of exposure directly proportionate to the personal variables every learner in a class possesses. Many studies (Johns, 1991; 1997; Kennedy & Miceli, 2001; Braun, 2005; Chambers et al., 2011) indicate that data-driven learning (DDL; Johns, 1991) can provide EAP learners with an opportunity to self-adjust the level of the input, particularly within EAP settings where non-native speakers of English teach grammar and lexis (Özer, 2017). "With its greater capability to vary the language exposure" (Egbert & Nakamichi, 2002, p. 111; O'Sullivan & Chambers, 2006, p. 62; Reppen, 2009) unlike hardcopy coursebooks, designed and published for meeting general learning needs of various learners, DDL can offer a much more comfortable and flexible journey into any grammar curriculum. It can also meet learners with an easy-to-update and expand content under the supervision of language teachers (Farr, 2008). (Özbay, 2015) discusses that L2 learners might not satisfactorily be able to manipulate language in an L1 fashion in terms of spoken or written language production. A language teacher with DDL in mind, however, can help learners build secure linguistic playgrounds governed by their own choices.

Within the specific context of this study, learners were having difficulty adapting to the density and load of input mainly since the existing class materials used particularly at the second level of the grammar course were based mainly on fabricated exemplars representing the mechanical aspects of grammar forms. This was observed to be directly linked to the increasing number of repeating learners (Rs) along with many first-time takers (Fs) of the course risking spending another two-month term studying exactly the same content through exactly the same set of materials produced in-house. Therefore, we aimed to develop new alternative teaching materials to use in LA (grammar) courses at level 2 for in-class use by making use of the authentic language comprising the academic texts studied in receptive-skills courses, and aimed to incorporate methods of computational linguistics, data-driven learning (DDL), concordancing, and keyword in context (KWIC) searches into material development procedures. Finally, we aimed to create a network of teaching materials based on an empirical approach demonstrating considerable potential in leading the learners to making connections between what they learned in different skill courses.

Constructivism and Data Driven Learning

This study has three dimensions: the adoption of DDL as a teaching method, the use of corpora by learners to explore the linguistic arteries of the target language for self-discovery of language and the incorporation of corpora and DDL methods into teaching material development procedures. We introduce DDL and self-discovery of language patterns (Zhang & Lu, 2015) as a teaching method that utilizes teacher-prepared (Reppen, 2010) corpus-based materials to address the problem of an increasing number of repeating learners in the second level of a grammar course, equivalent of CEFR B1, taught at the preparatory school of a state university in Turkey. The constructivist (Piaget, 1973; Vygotsky, 1978) manifestation of language teaching and learning, widely accepted by contemporary minds (Bruner, 1966; Cooper, 2016; Tang, 2016), has defined the roles of the teacher and the learner within an EFL classroom with the latter actively (Marlowe & Page, 2005) taking part in the epicenter of linguistic activities governing the teaching procedures as a novelty (Roblyer & Doering, 2010). Inside a language classroom where the teacher performs as a mentor, learners will find a valuable opportunity to interact with the genuine language occurring naturally (Sinclair, 1991) outside the walls of the classroom through various combinations of input, thus becoming autonomous (Reinfried, 2000) and taking responsibility of their own learning. Regarding learner autonomy, Johns (1991) points out the requirement for learners to build up linguistic knowledge independently, without needing the teacher as the one and only source of information in the language classroom, for which classroom concordancing or data-driven learning may be an ideal alternative. Data Driven Learning (DDL) supports the premises of the constructivist approach in that it transforms learners into linguistic researchers actively taking the responsibility for their own learning and teachers into research leaders or mentors guiding learners (Bruner, 1966; Schank, 1975; Flavell, 1987; Roth, 2000; Marlowe & Page, 2005; Roblyer & Doering, 2010). Using this kind of a hands-on experience, learners can interact with the genuine language occurring naturally (Sinclair, 1991) or the authentic use of certain forms by natives, or near native users of the target language through various combinations of input, thus becoming autonomous (Reinfried, 2000).

Corpora and Autonomy in ELT

The advent of Internet and computer technologies (ICT) have implications about language teaching (Smith, 2004). Using a computer, learners can easily adapt the level of linguistic input, and gradually improve at their own pace (Braun, 2005; Cobb, 1997; Chambers, 2005). Learners' enthusiasm for technology can segue into an L2-oriented pedagogical exploration of a language through a scaffolded introduction to ICT for DDL. DDL with the use of pedagogically relevant corpora has been on a rise across the DDL literature over the last two decades (Bernardini, 2000; Hyland, 2002; Argris, 2004; Braun, 2005; Meunier & Gouverneur, 2009). With the teacher being a "research director and a collaborator" in linguistic activities (Chambers, Farr and O'Riordan, 2010; Talai & Fotovatnia, 2012), or a "mediator" (Braun, 2005), learners explore linguistic data and discover language forms and meaning through DDL corroborated by pedagogically-engineered corpora. By introducing learners to a "pedagogic corpus" (Willis, 1993, p. 163), teachers help them improve their linguistic proficiency in an anxiety-free learning environment (Gilquin & Granger, 2010; Braun, 2005). Several studies seek some common ground where ELT might be boosted through the use of corpora. For instance, Flowerdew (1993) uses transcriptions of lectures learners attended in an ESP course and Osborne (2001; 2002) makes use of a sequence of native-speaker and learner corpora as a source for teaching materials. Aston (1997) and Roe (2000) suggest using small-size corpora engineered in accordance with learners' needs and interests. These studies successfully demonstrate how cohorts of learners might diverge from one another regarding the way corpus-based language pedagogy should be tailored. Even though the learner is directed towards autonomy, there are responsibilities of the teacher as well. Johns (1997, p. 100) advocates the idea that it is the responsibility of the teacher to alleviate the transition to

DDL methods by preparing corpus-based materials as a "first stage," which is defined by Widdowson (2003, p. 5) as "pedagogic mediation of corpora."

From a technicalities perspective, it should be noted that the use of corpora for pedagogical mediation requires "software that allows language teachers to search, manipulate and store the data, precisely what corpus tools enable" (Kilgarriff et al., 2014). The chosen software for in-class use might come with built-in databases featuring huge amounts of linguistic data (Grazib, 2009) which might surpass the needs of the learners. The cutting-edge linguistic technology might offer quick solutions to issues encountered by learners and teachers alike regarding lexico-grammatical and phraseological aspects in a given curriculum, enabling learners to construct their own learning through the assets of a data-driven approach. The corpus tools used for DDL-based language activities are classified by Kilgarriff and Kosem (2012) as computer-based and online tools that are installed and used for various tasks. O'Keeffe et al. (2007) and Gilquin and Granger (2010) consider computer assisted language learning (CALL) compatible language classrooms as an opportunity for adopting DDL in EFL settings. Cotos et al. (2017) underlie the fact that interactive learning technologies such as intelligent computer assisted learning applications should be understood clearly to benefit from DDL practices while Vyatkina (2016) argues that DDL creates input enrichment in the language classrooms through the use of corpus concordances and other technological tools that make it possible to automatically retrieve the collocations. Liou and Yang (2020) argue that computer technology with DDL makes it possible to consult the lexico-grammatical features through concordances and that it provides learners with self-directed means to observe the big picture as well as serve the students for various pedagogical ends. Corino and Onesti (2019) support the use of DDL method in CLIL classes as a tool to enable the learners and their teachers to use computerized corpus tools for authenticity and autonomy. Seidlhofer (2002) exploits corpora compiled by trainee English teachers, and reports that this had a positive effect on linguistic hypothesis testing (Smith, 2004). As cited in Boulton (2012), Maia (1997) compiled a themed corpus together with some Portuguese-English translation students, first by transforming paper documents into digital ones and later using the web as the main source of reference to provide bilateral positive reinforcement. Castagnoli (2006) argues the effectiveness of using the web as a source of reference for DDL practices, as the web can be a vast source for different possible combinations of words and expressions forming the meaning in particular contexts. Additionally, Sha (2010, p. 375) refers to Google as a "super corpus" in comparison with BNC (British National Corpus). With the help of a concordancer (Sha, 2010), DDL can help language teachers out when they are out of resources (Johns, 2002; Rüschoff, 2002; Hunston, 2002). Language teachers can foster linguistic self-confidence in learners (Kennedy and Miceli, 2001) and engage their cognitive mechanisms (Chambers, 2005) through DDL. By comparing concordance lines with the sentences they write, learners can correct the way they use them autonomously (Sha, 2005), and they can also self-regulate the amount and the level of linguistic input (McEnery and Wilson, 1997; Gaskell and Cobb, 2004; Renouf, Kehoe and Benerjee, 2007), thus "gradually building up their personal experience in the target language" (Sinclair 1991, p. 109). Bernardini (2002) discusses that the use of corpora increases learner satisfaction as it provides an abundance of written examples (Chambers, 2005) with a specific grammatical or lexical focus within a variety of contexts. Similarly, Seidlhofer (2002) exploits corpora compiled by trainee English teachers and reports on a positive effect on linguistic hypothesis testing (Smith, 2004).

The adoption of DDL activities to foster learner autonomy requires learners to gradually build up linguistic knowledge for their own benefit (Vygotsky, 1987). This can be done independently by going through decision-making processes with the guidance of the teacher and the first-hand use of DDL techniques utilizing corpora (Vickers and Ena, 2006). The traditional methods and means of classroom instruction aiming at teaching a foreign language may not provide learners with the freedom to self-adjust the amount and the level of the input as they prioritize stability (Ushiodo, 1996). This lack

of flexibility of input in the target language may be quite demotivating for some learners. Critics of the traditional approaches to language teaching, such as Brown (1990, 1994), explain that traditional schools are weak at initiating and sustaining intrinsic motivation in learners as they expose learners to a standard level and type of input for everyone in a classroom disregarding various psychological needs of individuals. So, granting the learners the chance to explore the target language in an "every learner a Sherlock Holmes" fashion (Johns, 1997, p. 101) can help them discover language patterns and meaning through their own effort. Learners can also be reviewers of the language who have a critical eye, actively questioning (Guan, 2013) so that they can understand the mechanics and principles governing the meaning, thus become independent (Denghan & Darasawang, 2014). The autonomy that DDL provides the learners with may facilitate this as it increases learner uptake relieving the teacher of this extra load of work (Benson, 2001). By assigning the learners to self-diagnose their needs the response time can be minimized, as well (Carter & Nunan, 2001).

Research Design

A review of the relevant literature demonstrated that Data Driven Learning (DDL)-based intervention could become instrumental in facilitating grammar instruction with a specific focus on English for Academic Purposes (EAP) and learner autonomy. To investigate this, the following three research questions (RQs) were formulated to guide the present research:

1. Do DDL instruction and corpus-based course materials improve learner achievement in grammar through autonomous learning?
2. What are the perceptions of the EAP learners towards the use of DDL and corpus database as ideal means to develop their language skills?
3. To what extent can the use of corpus-based teaching materials foster autonomous learning of grammar in the EFL setting featuring EAP instruction?

The educational applications of corpus linguistics can prove to be promising in terms of the insight they offer into the establishment of an approach to education fostering autonomous learning. From an argumentum a contrario point of view, it is the learner himself who decides what to learn, how and how much to learn within the pre-set parameters designated by the teacher, thus changing the teacher into a mediator of the learning activities, which is also collinear with the theoretical principals of this study. In order to achieve the linguistic goals stated in the research questions specific to this study, a number of steps needed to be taken as outlined in Table 1 below.

Getting to Know The Research Environment: A SWOT Analysis

The strengths and opportunities can be listed as the institutional emphasis on learner autonomy, high-end technical infrastructures, learners having laptops, the use of learning management system (LMS) Schoology, the gamified approach to language learning which can be a source of motivation for learners (Ybarra and Green, 2003), teaching materials being developed in-house, the multi-national on-campus community that provides a basis for the need to learn and use the target language by learners (Gardner, 1985; Dörnyei, 1994).

The weaknesses and threats, on the other hand, can be listed as the lack of linguistic input for Turkish-L1 learners off the campus, a lack of linguistic self-confidence in local learners, which raises their affective filters (Krashen, 1981), time constraints due to the density of the course content, the dynamic nature of the preparatory program and a lack of institutional decision taken about outposts materials developed.

Table 1 *Steps in the Study*

The Overall Study Design	1. Mixed-methods study: a combination of quantitative and qualitative methodologies
Compilation of the ACAT	1. The need for the compilation of the specified corpus is explained.
	2. The Design Criteria: the design criteria adopted in the process of the preparation of the Alternate Corpus of Academic Texts are explained in comparison with similar studies in the literature
Development of the Teaching Materials	1. The need for the development of new teaching materials is explained
	2. Piloting the Materials: outsiders were invited to test the new teaching materials
	3. Familiarising the Learners with DDL Techniques: learners get in touch with DDL techniques, the notion of corpus investigation for self-discovery of language patterns
Application of the Teaching Materials	1. The actual teaching experience emerging right from the field is conveyed
	2. Grammar Presentation: how grammar is presented through the use of the new teaching materials
	3. Grammar Application: how learners utilize DDL techniques to make use of both the ACAT and the new corpus-based teaching materials
Sampling	1. Convenient sampling: A total of 75 EFL learners taught by the researcher in two successive terms of 7 weeks each
Data Collection and Analysis	1. The pre-test and post-test of 2 seven-week grammar instruction strengthened by DDL techniques and a focus group interview with 26 participants
	Quantitative data analysis: Paired sample t-test: analysis of the pre and post-test scores of the samples on SPSS (v. 24)
	Qualitative data analysis: encoding the qualitative input by the participants and interpretation of high-frequency codes and themes

With a view to addressing the linguistic needs of the learners participating in this study and objectives designated by the curriculum, a corpus database of approximately one million words was compiled out of the academic texts used in reading classes in addition to the transcriptions of listening materials (mostly academic lectures) in a machine-readable format (with a .txt extension) ready to be analysed on AntConc (Anthony, 2014). This corpus was called the Alternate Corpus of Academic Texts (the ACAT), later combined with a corpus of graded readers previously compiled by the researchers to serve a similar purpose and to increase the representativeness of the database. As the present study aims to train learners to be self-sufficient and autonomous learners rather than understanding linguistic phenomena unlike studies like Nesselhauf (2004) or Cheng (2010), the ACAT whose total volume is 5 million words was not compared to native speaker corpora. Table 2 below shows the design criteria.

Development and Piloting of the Corpus-Based Teaching Materials

Unlike single-register corpora like VOICE (Seidlhofer, 2002; 2004) or ELFA (Mauranen, 2003), the ACAT offers a combination of spoken and written registers, providing learners with a relatively broader

Table 2 *The Design Criteria of the ACAT*

Source	Level	Size
Listening archive	Levels 1-4 (CEFR A1-C2)	10%
Reading corpus	Levels 1-5 (CEFR A1-C2)	40%
Graded readers library	Levels 1-6 (CEFR A1-C2)	50%

Table 3 *The Selection Criteria for the Examples*

Source	Primary Selection Criterion
The Readers Corpus	Level 1-3 mainly
The Listening Archive	Level 1-3 mainly
The Graded Readers Corpus	Level 1-4 mainly

panorama of naturally occurring (Sinclair, 1991) language in authentic academic texts and speech. Another advantage to working with corpora compiled out of texts already in use within the curricula is that learners will have increased exposure to the language specific to their field of study in their faculties. This can also allow teachers to keep the "momentum" (Kounin, 1970, p. 96) without needing to intervene to boost motivation. Based on the ACAT, a new set of LA2 materials were developed ad hoc. The implications of this are twofold. Firstly, the LA2 syllabus seemed not to be supported efficiently by the reading and listening materials. Learners had little chance to see the grammar they learned in LA2 take effect in reading and listening classes. Therefore, learners were performing relatively poorly in writing classes. Secondly, the existing set of LA2 materials were poor in contextuality even though they were prepared by native speakers. They bore a relatively narrower range of contexts, representing only the intuition of the writers often depicting solely the mechanical functions of grammar forms. However, there were also moments when even the ACAT endorsed by the readers' corpus fell short of representing the grammar forms at a satisfactory level. Online corpora such as http://fraze.it or http://skell.sketchengine.co.uk (Kilgariff et al., 2014) was instrumental to make up for this shortcoming. Table 2 below shows the dispersion of sources used in corpus compilation. To ensure the face validity of the materials developed, a group of native and non-native language instructors was asked to pilot the materials and comment on the following criteria:

Piloting Criteria

- Effectiveness in addressing the grammar focus; whether the material successfully addresses the grammar focus of each lesson
- Level of difficulty and whether exemplary statements are level-appropriate or not
- Self-attainability: How the tasks can affect learner motivation and uptake

Getting The Learners Au Fait With DDL

To increase the efficiency of the corpus-based teaching materials and help learners internalise the basic notion of the materials as well as the relationship between the ACAT and the corpus-based materials, the first LA 2 lesson was dedicated to getting the learners familiar with basics of DDL. Learners were introduced to the interface of the linguistic inquiry software and shown how they can upload the database to the software so that they can conduct KWIC searches was shown. The plain text files compris-

ing the ACAT and formerly compiled Graded Readers Corpus (Oxford University Press and Penguin) were uploaded to the online platform Schoology as well as the link to AntConc. Students were able to access and download these files. After they downloaded the tools, the teacher spent 30–50 minutes demonstrating how the learners can use AntConc to administer simple KWIC searches.

Introducing The Learners to The Corpus-Based Teaching Materials

Since it was not possible to isolate the groups to whom the intervention was applied from the rest of the institution, the corpus-based set of course materials developed using AntConc and the ACAT had to be dressed onto the existing syllabus. The then-current syllabus in effect featured 30 lessons covering 20 different grammar focus points. This corresponded to 28 hours of DDL instruction in each of the four groups which the researchers studied. The facilities ubiquitous onsite were employed to establish a DDL-oriented repertoire of addressing the learner needs. The LMS used institutionally, Schoology, played a crucial role in the delivery of the resources and made available some means making it possible for the learners to reach out to the researcher offsite. The related course pages on Schoology were re-designed to fit the novelty introduced. The researchers walked the learners through the folders and sub-folders as part of the hand-holding process. Figure 1 demonstrates the course page design for DDL instruction.

A brand-new set of corpus-based materials was developed by the researchers and put into action. These were comprised of two main bodies. First, learners were exposed to the authentic use of the target grammatical forms in the 'Grammar Introduction" parts (GIs). Reading through concordance lines curated by the researchers, learners were exposed to the level appropriate input. To reinforce this reading practice, learners were guided through exploring the ACAT performing simple keyword-in-context searches on AntConc in a hands-on fashion, which is formulated as "simulated academic reading" (SAR) in Özer (2019), and Çakır and Özer (2020). This teacher-guided self-paced reading activity to build up personal knowledge of L2 grammar enabled the learners to segue their way into the 'Grammar Application' parts (GAs), where they were asked to do exercises in four main categories as outlined in Table 4.

Application of The Corpus-Based Teaching Materials

The Language Awareness course consists of four levels the second of which was suggested by the academic directorate as a possible research ground for this research. LA 2 consists of 30 lessons covering 19 different grammar focus points some of which expand over more than one lesson. The first 2 lessons
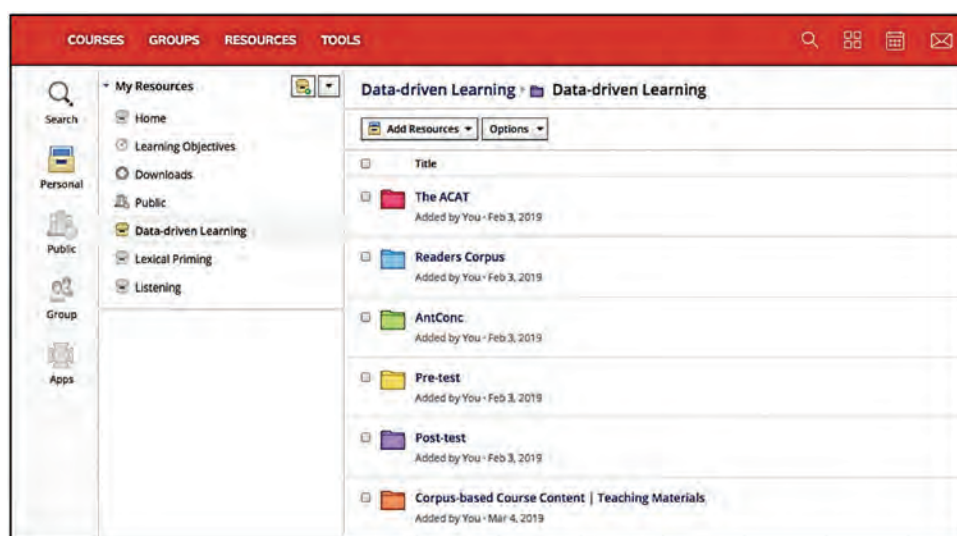

Figure 1 *The DDL page preview on Schoology.*

are spent to get the learners familiar with the course content and assessment procedures. The learners are taught the course 4 hours a week. Throughout each term, lasting 8 weeks with the last being the exam week, there were 28 hours of DDL instruction that LA 2 learners went through. Table 5 below shows the predesignated grammar topics of individual lessons.

Table 4 *Subsections in the GAs*

Task Type	Task Objective
Gap-filling	Learners are prompted to fill in the gaps with the correct forms
Error identification and correction	Learners are prompted to find errors and correct
Finding the meaning	Learners are prompted to find paraphrases for given sentences
Simple sentence writing	Learners are prompted to write simple sentences using the form

Table 5 *Language awareness 2 lessons and lesson content*

Lesson Numbers	Lesson Focus
3	Participle Adjectives
4	Types of Sentences
5	Questions
6	Embedded Questions
7	Reporting 1
8	Reporting 2
9	That Clauses
10	Synthesis of Sentence Patterns
11	Introduction to Clauses and Clause Types
12	Conditionals 1
13	Conditionals 2
14	Time Clauses 1
15	Time Clauses 2
16	Relatives 1
17	Relatives 2
18	Reason and Result Clauses
19	Contrast Clauses
20	Purpose Clauses
21	Mixed Tenses Review 1
22	Mixed Tenses Review 2
23	The Future Perfect and The Future Perfect Progressive
24	The Present Perfect Progressive
25	Passives 1
26	Passives 2
27	Passives 3
28	Passives 4
29	Past Modals
30	Preposition Phrases

As mentioned previously the materials that were developed for this particular study served a practical function. Not only were they expected to diversify the way LA 2 courses are taught in a comparatively more empirical way, but they were also believed to help learners build up cognitive bridges between essential skills such as academic reading, listening and writing. The research followed 3 main stages, outlined below, in the application of these materials. These materials helped the researcher collect data about the learners' language development in a collative and cyclical sense by means of which all the other skills are also expected to benefit from the outcomes of the application of these lesson materials as seen in the figure below:

Sampling

Driven by the then prominent timetabling issues, the researchers had to include the groups of learners they taught in this study who were aged between 19 and 23. This resulted in the casting of four different groups of learners in two consequent terms each of which lasted eight weeks. In term A, the researchers worked with two level-two groups, both of which were included in the study. Then, in team B, there were three level-two groups available, two of which were selected randomly. The learners in the level groups of A and B teams were all Turkish-L1 learners who succeeded at Level 1 in a previous term as well as several others who failed the second level at the end of the same term. The teams differed in terms of the members in each of the level groups. Hence, the asynchronous nature of the data collections results from the fact that different groups and individuals participated in the study in two consecutive terms. This also caused an unorthodox experimental design where the groups in each discrete term featured de facto control groups comprised of learners repeating the second level of the course. This is so because the researchers had learners who hadn't had any DDL experience in both teams. Also, a group of repeaters participated in each group.

Students and Computer Technology

The participants' degree of dexterity and literacy of working with computers and corpus tools developed step-by-step assistance by the researchers. Throughout the application of the DDL methodology, with which the learners had hands-on experience with corpora for the first time in their lives, we observed that the learners were having difficulty in using rather technical means of learning. To promote a collaborative classroom environment, the teachers asked the learners who received guidance to help others in need of similar guidance and a sense of collaboration soon became prevalent. Male learners were especially observed to be better and faster at adapting to the technology aspect of the new approach and helped female learners, some of whom reported themselves to be verbal and audial learners. Transforming a learner in the traditional sense into a modern one using technology heavily to support their own learning was challenging at times when technology failed. System crashes, drained batteries and non-responsive software were some impediment factors apart from the content-related aspects of the lessons which the learners needed time to get used to. Learners were first encouraged to see 3–10 example sentences and if they still felt uncomfortable with the corpus they were guided to an online dictionary. One learner complained that she was overwhelmed by the density of the input provided by the software when she wanted to see a word she thought she knew but could not remember at that moment. Afterwards, she was advised to be selective and read 3–5 randomly selected sentences. The teacher told her if she still thought she had difficulty understanding, she could easily jump to an online dictionary so long as it is a monolingual one. Soon after, she reported that she was feeling less stressed. Some were worried about using a computer while some others claimed that they would be lost without a teacher delivering information in front of the class and eventually fail the course. The learners were observed to explore their way throughout corpus-based LA 2 content.

Pre-test and Post-Test Procedures

The pre-test and post-test of 2 seven-week grammar instruction strengthened by DDL techniques and a focus group interview with 26 participants. The number of students who took part in the interview does not represent any pre-determined criteria that would be likely to affect the outcome of the study. The participants were interviewed selected on a voluntary basis from among the 75 participants and were observed to be happy being interviewed. The pre and post tests were comprised in four sections that include such exercises as gap-filling, error identification and correction, determining the meaning and simple sentence writing. (See Appendix)

Data Collection and Analysis

Quantitative and qualitative data collection tools were used in the study. Quantitative data were collected through the application of a pre and post-test of a seven-week "deductive DDL" (Cresswell, 2007, p. 270) instruction. Both the pre and post-test followed the same format as the teaching materials developed ad hoc. As the researchers were institutionally restricted to intervene in the official exam procedures, learner achievement in these was disregarded, thus making this study a quasi-experimental one. Unlike studies like Goudarzi and Moini (2012), Kılıçkaya (2015), or Kabir and Kisai (2017), this study does not feature a delayed post-test due to time constraints. A paired-sample T-test, rather than a one-way ANCOVA, was calculated as the number of the variables to be compared was two. The qualitative data were collected through focus-group interview with the participation of 26 learners. This accounts for almost 33% of the samples and the interview with the learners were done on a voluntary basis. It is also expected that this number would represent the whole body of the samples participating in this study. 13 randomly selected learners from group 2, representing learners in term A, and 13 others from group 4, representing the learners in term B, participated in the focus group interview. Table 6 below shows the demography of participants in the focus group interview. Due to the nature of the research environment and variables out of the researchers' control, the sampling technique that seemed to be suitable for this study was convenience sampling. Each of the 2 terms in which this study was conducted lasted 8 weeks and samples of this research were only the learners who were those in the researcher's LA 2 classes within these successive terms from groups 2 and 4.

The respondents were asked to provide written answers to 3 questions asked in the interview due to time constraints. Some respondents, such as respondents 2, 5 and 16, avoided answering the questions. They gave a bulk response in which they summarized what they thought. Therefore, their responses were not included in the encoded analysis of the qualitative data. Following the collection of the responses of those who provided individual answers for individual questions, these were transformed into a small-size corpus and a frequency analysis was carried out on AntConc. The analysis yielded a pattern of common codes and themes.

Table 6 *The participants of the focus group interview*

Team	Group	Number of Participants
A	2	13
B	4	13

Results

Quantitative Data

Data regarding the first research question was collected through the application of a pre-test and a post-test. The pre-test was designed to look similar to the official midterm examination while the post-test was designed to look similar to the official final assessment so that they can also serve as alternate exam practice materials, with the extent of the latter being larger than the former. The marking scheme for both the pre and the post-test were similar to that used for official exams administered at the institution. This was done intentionally to increase the learners' commitment and attentiveness. The test scores of the learners taking part in the study were first categorized and interpreted and later analysed on SPSS to see whether the DDL instruction made a statistical difference or not. For this purpose, a paired sample T-test analysis was carried out on SPSS. The statistical difference between their pre and post-test scores was calculated and interpreted.

Pre-Test

The study conducted with 78 learners commenced with the application of a pre-test. The average pre-test score for Repeating Learners (Rs) was 53 while it was 55 for First-time Takers (Fs). In general, Rs started with a slightly lower performance when compared to Fs excluding F-DROPs. After a closer inspection of the demography of the Rs, it was observed that, out of 32 Rs, 15 were learners from the previous academic year who had to repeat LA 2 for another time and 17 were those who started taking LA 2 at the beginning of the academic year in which this study was carried out. The latter 17 Rs are freshmen who joined the preparatory program right from LA 2 after coming out of the exemption exams with their grammar knowledge being identified as adequate for level 1. The contrast between the success rate of Rs and Fs can be seen in Table 8.

Post-Test

Following the implementation of the innovation through DDL and corpus-based teaching materials developed ad hoc, the learners were given the post-test. The post-test tasks were the same as that of the pre-test with a difference in the topics covered. This was due to the time constraints, and the number of pre-determined lessons for was higher than the number of topics covered in class. Naturally, the same tasks were assigned along with other topics to be covered. The learners seemed to have performed seemingly better on the post-test by and large.

A paired sample t-test was calculated to see whether the innovation could cause a statistically meaningful increase in test scores of the participants who finished the term within the study. The pre-test mean scores were compared with the post-test mean scores of the learners in each group. The Sig. (2-tailed) value of the paired samples t-test has to be below 0.5 so that the training can be considered to have made a statistical difference. Sig. (2-tailed) values are as shown in Table 9.

Table 7 *Number of Learners in Each Group Participating in the Study*

Group	Number of Learners	Team
1	20	A
2	18	
3	20	B
4	20	

Table 8 *The Demographic Diversity of Rs in terms of Learnership*

GROUP 1	Category	Times repeated the same level
L3	R1	3
L4	R2	1
L5	R3	3
L7	R4	1
L13	R5	3
L17	R6	1
L20	R7	1
L21	R8	1
GROUP 2	**Category**	**Times repeated the same level**
L4	R9	1
L5	R10	3
L6	R11	1
L8	R12	3
L10	R13	1
L12	R14	3
L14	R15	3
L15	R16	1
L18	R17	1
L19	R18	1
GROUP 3	**Category**	**Times repeated the same level**
L7	R19	3
L11	R20	3
L15	R21	1
L18	R25	3
L19	R24	1
GROUP 4	**Category**	**Times repeated the same level**
L1	R25	3
L4	R26	1
L5	R27	3
L6	R28	3
L9	R29	1
L10	R30	3
L13	R31	3
L15	R32	1

The 't' value in the paired samples test for group one tells us the statistical significance of the results. For group 1, the t value is –5,006 which is a relatively small and negative number. This correlates to a very small significance value which is ,000 for group 1; however, this is not equal to zero. There are digits to the right which are not represented in the table yielded by the software and the significance value, or the 'p' value, is less than 0,001. The interpretation of the paired sample t-test results for group 1 seems to apply to group 2 as well. With the pre-test mean value for group 2 being roughly 52,8 and

Table 9 *Learners with Decreased Performance on the Post-test*

GROUP 1	Pre-Test Score	Post-Test Score	% of Change	Result	Category
L4	45	42	−6,66	NEGATIVE	R2
L7	37	37	0	NEGATIVE	R4
L11	78	72	−7,69	NEGATIVE	F7
L17	49	41	−16,32	NEGATIVE	R6
GROUP 2	**Pre-Test Score**	**Post-Test Score**	**% of Change**	**Result**	**Category**
L10	64	59	−7,81	NEGATIVE	R13
GROUP 3	**Pre-Test Score**	**Post-Test Score**	**% of Change**	**Result**	**Category**
L18	67	65	−2,98	NEGATIVE	R23
L19	64	63	−1,56	NEGATIVE	R24
GROUP 4	**Pre-Test Score**	**Post-Test Score**	**% of Change**	**Result**	**Category**
L1	70	64	−8,57	NEGATIVE	R25
L15	70	54	−22,85	NEGATIVE	R32

Table 10 *Sig. (2-tailed) Values for Groups 1–4*

Group	Sig. (2-tailed) Value
1	0,000 < 0,5
2	0,000 < 0,5
3	0,000 < 0,5
4	0,252 < 0,5

the post-test mean value 70,5, the mean difference was calculated to be –17.7. Speaking of how this affects the significance of the results, the t value was calculated to be –6,476, which is again a small and negative number just like the one in Table 22. The p value appeared to be ,000 which is less than 0,001 but not equal to zero. P value for group 2 is less than 0,5 which represents a statistically significant change for the better. Similarly, the test scores of the learners in group 3 also represent a change for the better. The pre-test mean value was 54,95 and 70,7 was the post-test mean value which represented a difference of –15,75. The t value, which is the significance value was calculated to be –4,801 and this correlates to the p value of ,000, which is less than 0,001 but again not zero. Therefore, it is possible to say that there was a change for the better in group 3 as well. Unlike groups 1, 2 and 3 group 4 yielded the lowest number for the t value but the highest for the p value as table 25 shows above. With the t value being –1,182, SPSS calculated the significance value to be ,252 which is higher than 0,001 but at the same time lower than 0,5. Therefore, it is possible to say that the change that the study made in group 4 was statistically meaningful. However, group 4 appears to have changed less than the others. Because the higher the p value is, the lower the significance of the difference is. However low, there seems to be a statistically significant change with group 4, too.

Qualitative Data

The qualitative data for the second research question were collected using a research log and a semi-structured interview. The respondents to the latter were asked to provide written replies to an online survey in either Turkish or English. Throughout the application of DDL techniques, in terms

A and B, the researchers had talks about what the learners thought and how they felt about the new technique that they went through. The researchers also kept a research log, the entries to which represented their personal experiences with the learners to provide future researchers with insights into possible opportunities and obstacles that an educational researcher may have to deal with throughout studies like the present study.

The third research question was based on focus group interviews held with group two in term A and group 4 in term B. Groups two and four were interviewed at different times. Group two was interviewed within week four of term A and group four was interviewed at the end of week seven in term B. The groups were interviewed after a two-week-lapse in teams A and B so that the researchers could understand how the learners would react to the techniques over time and if the motivation levels of the learners decrease or increase considering the official exams being close. There was a total of 26 respondents, 13 respondents from each group, accounting for almost one in every three learners participating in this study.

The first question aimed at investigating the overall attitude towards and perception of the computational techniques of the study. In Table 11, "yes" was frequent and demonstrated an overall positive attitude towards the methodology applied. The second most common code/theme in the responses represented the fact that the students thought DDL techniques helped "improve their grammar". With a strong connection to this, the third code/theme also confirms this affirmative trend in the responses with 10 respondents reporting that they thought DDL techniques "helped them learn" grammar.

In the second question 13 out of 26 respondents replied saying "yes", 7 of them reported that they thought they could improve their writing as DDL helped them remember and learn more. 10 other respondents clarified their positive attitude by referring to the fact that DDL is a source of "different example sentences, forms and usages" which eventually increased their exposure to the naturally occurring language.

Table 11 *Encoded Representation of the Codes/Themes that Emerged in the Research Log*

Keyword	Frequency	Number	Codes and Themes
Learners	12	1	… without my instruction **learners** autonomously started to …
		2	… positive. During lessons **learners** yielded positive …
		3	… embraced by some **learners** though the number …
Database	7	4	… add new text into the **database** and make it …
		5	… of having a **database** of academic texts …
Students	5	6	… they are university **students** I do not …
		7	… or, are the **students** only trying to …
		8	… I see some **students** though only a [few]…
Grammar	4	9	… texts and study grammar through these was [embraced] …
		10	… others referring to **grammar** reference books as …
		11	… why they consulted **grammar** books and if …
		12	… understanding of the **grammar** element they were …
Asked	4	13	… some even **asked** if it was [possible] …

Table 12 *Encoded Representation of the Codes/Themes that Emerged in the Focus Group Interview for Question 1, 2 and 3*

Questions	Codes/themes	Responses
1. Do you think DDL techniques helped you improve your grammar?	Yes	1, 6, 7, 8, 9, 10, 11, 14, 18, 19, 20, 22, 26
	Improve my grammar	4, 11, 12, 13, 20, 21,23
	Help me/us learn	15, 8, 19, 4, 23, 10, 26, 11, 6, 21
2. Do you think DDL techniques helped you improve your grammar?	Yes	1, 6, 7, 8, 9, 10, 11, 14, 18, 19, 20, 22, 26
	I can improve / remember / learn	4, 11, 12, 13, 20, 21,23
	Different sentences/forms/usages	15, 8, 19, 4, 23, 10, 26, 11, 6, 21
3. What is your overall opinion about DDL techniques?	(AntConc) is a good application	1, 6, 7, 8, 9, 10, 11, 14, 18, 19, 20, 22, 26
	(I/We) can use/learn	4, 11, 12, 13, 20, 21,23
	(DDL/AntConc) is helpful	15, 8, 19, 4, 23, 10, 26, 11, 6, 21

The third interview question aimed at receiving subjective wording of what the respondents thought about DDL techniques. 13 out of 26 students said that the software was a "good" application. With only a few suggesting a mobile application that could have facilitated the procedures, 7 said that they were able to use the software to learn while 9 others reported AntConc to be a helpful tool for learning grammar.

Discussion

The findings obtained from the study seemed to suggest that the learners performed noticeable progress in learner performance of both tests with DDL instruction. Research logs used by the researchers revealed several content words for further analysis. The focus group interview data also revealed a positive reaction towards DDL-based grammar instruction. It is also revealed that DDL-based grammar instruction helped increase the learners writing through serving as a tool to provide many contextual examples. Finally, AntConc software was found to be an ideal tool for DDL-based grammar learning activities

Pre and post-tests

A comparison between the post-test scores of groups that received DDL instruction in different terms helped us understand that learners were able to do better even if they were off the traditional margin of teaching that they are used to. The participants' post-test scores are higher than their pre-test scores, which does not necessarily mean that they have been transformed into fully autonomous learners. However, it may be claimed that that these learners adapted to the change and the increase in their test scores demonstrated their efforts to survive the new approach. The pre and post-test scores of the learners in all groups before and after the application of DDL instruction depicts an upward trend. Most of the learners, except for only a few, got higher on the post-test than the pre-test, which indicates a positive change supporting the effectiveness of the techniques. The results indicate that the DDL techniques adopted for LA 2 have apparently contributed to learner development. However, attributing all the credit to the DDL techniques would be unrealistic as the depth of the change made seems to be profound considering the educational habits and backgrounds of the learner-participants. Despite the fact that a deeper understanding of the techniques can better be reached through the analysis and comparison of the data collected from a series of applications carried out in successive terms, the current

situation seems to be promising as the number of Rs who scored higher on the post-test seems to have increased. Although this study bears no implications about student pass rate, with the exact pass rate being unknown to the researcher, the upwards trend in the post-test is expected to have affected the overall pass rate positively. When the pre and post-test scores of the learners are compared, only 9 students appear to have scored lower on the post-test than the pre-test. 8 repeaters and 1 first-time taker were not able to demonstrate a positive change in the post-test. There may be many reasons, and this could become the incentive for follow-up research. However, as the demographic mobility of learners through this utterly dynamic preparatory program cannot be controlled by the researchers, these possibilities have to be ignored.

As can be seen in Table 10 above, the deductive DDL instruction seems to have made a statistically significant difference at the end of 7 weeks. With these being the statistical output of SPSS, it is not possible to give all the credit to the DDL methodology, though. It is pretty much obvious that other factors such as "motivation" and "aptitude" may be contributing to the efficiency of the techniques. Towards the end of any given term, learners were observed to be intrinsically motivated more than they had been at the beginning and during the application. This may have also contributed to the learners' relatively increased success on the post-test.

The research logs

As can be seen in Table 11, five content words appeared to have analytical value. 'Learner' is the most frequently used word in the research log. This may indicate that a large number of learners hesitated to trust and adopt novelty, and they demonstrated an increasing level of engagement with the new techniques. The word 'database' demonstrates learners' commitment into the application of the new techniques in two concordance lines only. The idea of having one's language database seemed to be in close interaction with the establishment of learner autonomy. The words 'learners' and 'students' appear to be of different qualitative value in this research. The word 'learners' can be associated with a more positive atmosphere while 'students' appears to be used when there arose an issue with operational procedures of the new techniques applied. 'Grammar' and 'asked' received 4 hits each on the frequency analysis. Although these two words have the same number of occurrences, 'grammar' seemed to have greater qualitative value as four concordance lines provide insights into realities of the samples. It can be argued that DDL was not able to fully change the learners' minds about traditional language instruction. Instead of abolishing their learning habits altogether, they somehow tended to keep one foot on the safe territory, which seems to be "grammar reference books" for them. As for the word 'asked', it denotes the effort of some individuals to speculate about the usefulness of and manipulate the new techniques to address their personal pedagogical needs as language learners.

Focus group interviews

Based on the overall responses, it can be deduced that the idea of being independent was favoured by respondents who also seem to support DDL techniques and who are observed to have built up self-confidence in problem solving. Despite the availability of multiple free online applications, the ACAT that has a specified corpus database was used in this study. The offline usability of the application was also highlighted by the respondents. Learners developing technologies to support their own learning created a genuine autonomous learning atmosphere. DDL provided them with independence from the instructor, chances of self-discovery of language patterns, collocations and colligations and self-determination. Being critical of themselves, the respondents also confirm that there is an apparent need of change speaking of the way they approach to language learning and that they became aware that the traditional way of schooling was poor at teaching them English.

The responses also indicate that the preparatory program requires English to be taught in separate skill courses where learners transfer what is learned in one skill course to another. They are supposed to build up their own cognitive bridges across different courses so that they can have a holistic picture of what they learn. However, as one respondent clearly emphasized, the overall impression is that they have difficulty relating one course to another which results in a disintegrated conception of English as a school subject, whereas DDL techniques have a subliminal sense of building up bridges between various skills.

The mistakes they make are strong indicators of a developing lexicon and grammar skills. One of the highlights of LA 2 throughout the study was that the learners referred to 'fraze.it' along with the ACAT rather than dictionaries when they saw an unknown word within the teaching materials. This may be why the learners kept repeating the fact that they can or could benefit from DDL in terms of vocabulary as well. Another respondent seemed to have internalised using the database as a dictionary unlike most others who still needed a dictionary when they saw a new word. The fact that learners can see several examples of a target word or the grammar pattern appears to be the most useful aspect of the application as explicitly stated by the majority of the respondents in the interview. One criticism uttered by a respondent is that the interface of the software is complicated. The responses to question 3 by several respondents mean that these learners look for some sort of similarity between the technology used at school and the one that they are exposed to outside the school. This may also mean that these learners are used to being visually stimulated, and if educational technology lacks this sort of stimulus, they have difficulty getting used to it or simply refuse to use it. As mentioned previously, the learners are expected to transfer the skills they develop in one course to another to achieve an overall language development. This implies the previous learning experiences of these learners, most possibly, are not reminiscent of any technology being used as intensely as DDL purports and, therefore, schemata related to this might not be activated. Even when learners are explicitly addressed that they need to transfer knowledge acquired and skills developed in one course to other courses so that they can accomplish a holistic language learnership, this seems to have very little effect in real life. However, when learners are encouraged to take responsibility of their own learning, they gradually start looking for alternative ways of using the resources provided by the teacher.

The anonymity of the responses to the interview was another factor that minimizes the risk posed by individuals who may otherwise have tried to please the authority by responding in an affirmative tone. Other responses mainly focused on certain topics. A certain amount of reading with a view to self-discovery of grammatical forms appears to be essential in learning grammar. The sentence-based reading practice, which is called SAR in this study, provided by the applications allowed the learners to practice both their reading skills and gave them the opportunity to realize how certain forms are used, how they function in a context and what other words accompany these. The reading of academic realia in small doses demonstrates a good example of how statements at an academic level should be formed, thus allowing the learners to emulate these in their writing.

The qualitative and quantitative findings obtained from the study seem to suggest that the learners performed noticeable progress in learner performance of both tests with DDL instruction. This relative success can be given to several factors as well as the positive role of DDL instruction. Research logs used by the researchers revealed several content words for further analysis. The focus group interview data also revealed a positive reaction towards DDL-based grammar instruction. It is also revealed that DDL-based grammar instruction helped increase the learners writing through serving as a tool to provide many contextual examples. Finally, AntConc software was found to be an ideal tool for DDL-based grammar learning activities.

This research findings are in tandem with previous research in that the implementation based on DDL helped students to transfer what they learn in grammar courses by making use of their reading skills

to writing and this can contribute to the achievement of a whole-learner performance (Lin, 2019; Boontam and Phoocharoensil, 2018; Nugraha et al., 2017; Yılmaz, 2017; Lin and Lee, 2015). In a straight line with the general impression that one would get from the responses of 26 learners participating in the interview, there seems to have been a positive atmosphere during lessons. This can be partly due to the novelty introduced through the application of DDL techniques, and to some extent the way that the researcher handled the procedures all the way through. The interaction between learners and the teacher may have contributed to the facilitation of learner adaptation of the techniques by simply fostering motivation. The learner attitude towards the software used, the idea and the philosophy behind this seem to have met with little resistance with only a few learners being critical about the application. Particularly, Moon and Oh (2017) revealed that grammar instruction through data driven learning-based intervention can result in cognitive and affective benefits and can be considered as helpful for the EFL learners. who discover and organize new rules from the concordances. Similarly, in another study conducted to measure the extent of DDL activities in teaching Grammar, Muhyidin (2020) found that the data driven learning was implemented in teaching grammar through inductive DDL tasks based on BNC data and the classroom applications and teacher feedback. The students noticed grammatical patterns freely, which is coupled with follow-up exercises through homework, classroom production and teacher's feedback. Thus, they incorporated DDL in learning English grammar successfully. As to the relation between learner autonomy and DDL, Morgoun et al., (2020) found that DDL and free work can increase learner autonomy. Carrying out an activity-based survey, they found that DDL materials are more motivating and engaging. In sum, the present study revealed that using DDL activities can be instrumental in facilitating grammar instruction in EAP classes, increase learner autonomy, provide context-rich materials through incorporating a corpus pedagogy in action.

Limitations and Implications

As for the future of teaching English through DDL methods, this study suggests DDL as a practical approach to both learning and teaching English as a foreign language. With this in mind, however, it may fulfill its purpose with several future implications for researchers studying in the field of corpus linguistics and its educational applications, for language learners and teachers and for tertiary-level curriculum developers in search of experimental solutions for the long vexed and concurrent problems in language teaching and learning.

Regarding the particular context of this study, it can also be claimed that the adopted methodology for the study bears educational practicality and that educational research carried out by teachers in real-life settings can be a way of understanding the learners' potential within a certain context. As mentioned previously, learners' achievement in academic writing is expected to be higher even though this may not always be the case. This may result from a lack of enough reading at an academic level. A survey on how learners perceive themselves as academic writers and how faculty teachers evaluate the learners' current status can yield data supporting the findings of this research and inspiring further research. Moreover, further practice materials exploiting corpora can be developed and deepen the understanding of the issues emerging in classrooms and the effect of the techniques applied in this study.

Every year, the number of students accepted to universities in Turkey increases due to the growing population of young people. In the particular context of this study, the primary implication of this is twofold: first of all, it means there are now more learners to go through this peculiar system which increases the role of teachers teaching subjects like LA and writing which require the teacher to provide individual feedback for every learner. Secondly, the aptitudinal characteristics of new learners may not be favourable enough to support a curricular structure that highlights autonomous learning and self-sufficiency of language learners. These increase the importance of the need for the learners'

self-efficacy and self-determination considering their own learning. It can be assumed that DDL techniques and a curriculum based on the use of these techniques can facilitate possible difficulties posed by external variables. Therefore, the application of these techniques and teaching materials is highly advisable in the particular context of the preparatory program. This research is therefore significant and considerable in that it offers insights into the utilization of DDL techniques as a means of problem solving in educational contexts.

To sum up, DDL as a concurrent theme in corpus linguistics is capable of making a change in the way English is taught. DDL seems to be an ideal method for language schools that run on a tight schedule as it highlights learner autonomy with the use of technology carrying language learning beyond the walls of classrooms. Therefore, DDL could be a remedy for concurrent shortcomings of in-class language teaching and a language learning skill for the perpetuation of learning at one's own pace. It could be possible to say that a combination of multiple studies can compensate for what individual studies in the same field lack. Therefore, the scope of this study can be further extended through applications of other studies that focus on different aspects of the educational applications of corpus linguistics and different elements of English which this study doesn't. Having said all of these above, it should be mentioned that this research aimed at understanding the realities of a specific and relatively small group of learners. While the following statements may be true about the sample of this study, they may not apply to the whole population of learners even in the same institution. Therefore, it would be more feasible to limit the future implications of this particular study with the specific context of LA 2 learners for the following terms.

Conclusion

This study aimed to expand and deepen our understanding of the ways DDL activities can be incorporated into grammar instruction in an L2 context for fostering autonomy and creating effectiveness of learning for EFL learners. Although several studies so far have examined the effectiveness of DDL for ESL/EFL learners, majority are based on limited data, and it seems that more empirical studies are needed to validate the DDL approach for language learners. It is also clear that the DDL approach needs to be examined from the perspectives of "evaluation of the attitudes, practices of the learners, and efficiency" (Boulton, 2008, p. 41). We believe that examination of the effectiveness of the DDL activities in an L2 context will be a new contribution to the field.

From a broader perspective, it should be accepted that any experimental study in education can yield positive or negative results depending on the variables and circumstances defining the flow of applications. In this study, we aimed to see the extent of the effects that the interaction between learners taking LA 2 and DDL techniques and the learners were required to carry out KWIC searches using a specified corpus database named the ACAT so that they can notice patterns and inform their future language performances. These direct and teacher-guided experiences of learners with corpora helped the researchers understand the impact caused by DDL both quantitatively and qualitatively, which offers a multidimensional perception of these realities of the samples of the present study, though.

Thinking back to the initial phase of this study, the researchers were inspired by the idea that when learners are allowed to explore the language by their own means making use of computers to analyse digitalized compilations of naturally occurring language, it would be easier to both satisfy the needs of the learners and the curricular requirements and objectives of an institution teaching English as a foreign language. Therefore, individual differences between learners would not be much of an issue as the level and speed of the input are adapted by the learners themselves rather than an outsider which is the teacher in a language classroom. Problem- solving skills, self-determination, and a sense of independence appear to be the essential survival skills for individuals with an academic outlook on life.

From a more technical point of view, it is possible to say that in today's rapidly changing and growing world, learners need to become self-sufficient in terms of accessing information so that they can keep up with the pace. Therefore, the abundance of digital technologies, allowing users to access information anytime, can easily find solid grounds as a source of inspiration for technology enthusiasts. The students born into a relatively more digitalized world can be provided with better opportunities that traditional printed teaching materials may not. In this same vein, in the context of the present study, AntConc 3.4.4 (Anthony, 2014), freeware available online to be used for linguistic inquiries in and outside classrooms was employed. The aim was to introduce the notion of combining computer technologies as a source of information with self-guided learning as a study skill and a major technique to utilize to learn a language.

To sum up, even in the absence of a genuine control group, it can be possible to establish an experimental design referring to varying demographics in classes. This study aimed to demonstrate a novel approach to experimental designs in DDL studies, ruling out the need for an external control group but rather focusing on internal demographics to get a deeper insight into how two different kinds of learners forming a group could react to the same inductive language instruction. The present study concludes that DDL can diminish the chances of failing a grammar course when learners approach from a self-regulated perspective whether they take the same course once or twice. DDL can help learners self-diagnose their conditions which could otherwise be hidden from teachers' sight in a traditional language learning setting.

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Appendix
Pre and post test procedures

PRE-TEST

Data-driven Learning

SECTION A	/10
SECTION B	/10
SECTION C	/10
SECTION D	/10
TOTAL	**/40**

Student ID number :
Course Code :
Your Teacher's name :

PLEASE READ EVERY INSTRUCTION CAREFULLY!
You have 50 minutes to answer the questions.

Section A | GAP-FILLING
Fill in the gaps. Read the instruction for each question carefully. Write one word in each gap.

1) Fill in the gap in the sentence below with the correct form.
The ancient Egyptian civilization was one of the first in the world, and has _____ people from its own time down to our time. **(FASCINATE)**

2) Fill in the gap below with the correct question word.
The phone rang. It was probably Heloise, who had gone to Paris with a friend to do some shopping. "Hello?" said Tom. "Hello, ah to _____ am I speaking, please?" a man asked in French.

3) Fill in the gap to complete the reporting statement.
She wrote to several big cosmetics companies and asked _____ they could help her, but they all thought that she was crazy.

4) Choose the best reporting word to complete the sentence below. Make any necessary changes.
A) ASK   B) REPORT   C) DISCUSS   D) QUESTION

The newspaper _____ that Mary was killed during a robbery. What does this tell us about white society? What other facts support your view?

5) Fill in the gaps with the same word.
It's very important _____ everyone takes great care when completing his or her voting paper. Mistakes mean _____ a voting paper may not be counted.

PRE-TEST

Data-driven Learning

Section B | ERROR IDENTIFICATION & CORRECTION

Put a circle around the word or words that have error in the following sentences. Write the correct for in the space given if there is a mistake. If the sentence is correct write **CORRECT**.

1) EMBEDDED QUESTIONS

I asked the man at the gas station in Benson, "Do you know a store where can I sell my watch?" And he pointed to a store near the station.

2) EMBEDDED QUESTIONS

"I think Marylou was very wise to leave you, Dean," said Galatea. "You have no sense of responsibility. You've done so many awful things I don't know what to say to you." Dean just laughed.

3) PASSIVE

I'm a friend of Mr Stevens' nephew, John.' 'Ah, yes,' said the caretaker. 'John has arrested by the police.'

4) PASSIVE

The Scottish government would also begin talking with the EU and the UN to discuss its future and decide if Scotland will be allows to be a member of the EU and the UN.

5) PASSIVE

In China, a second child was allowed in rural areas if the first-born was a girl or was born with a disability.

PRE-TEST

Data-driven Learning

Section C | DETERMINING THE MEANING

Write what you understand from the statements below in no more than 5 words.

1) RELATIVES

They were no longer cheerful but they were not bitter. They were generous country girls who accept that such things happen.

2) VERB TENSE

Four thousand years ago, people spoke a variety of languages in China. Then the emperor said people could only use Mandarin.

3) VERB TENSE

In college, students may actually work harder than they have ever worked before and still find that their efforts are not sufficient.

4) FUTURE PERFECT

You can use the success of your projects in those areas to encourage knowledge management projects in your other business areas. Within a few years all leading companies will have achieved high levels of digitally aided knowledge sharing.

5) PRESENT PERFECT PROGRESSIVE

Poles have been coming to Britain for a long time and there are Polish communities all over the country. In 1939, at the beginning of the Second World War, thousands of Poles escaped the Nazis and came to Britain.

PRE-TEST

Data-driven Learning
Section D | SIMPLE SENTENCE WRITING

PART I – Re-write the following statements using the bracketed words.

1) REASON RESULT CLS
Some college students get into academic difficulty. College is not really very important to these students. (BECAUSE)

2) CONTRAST CLS
Blair McMillan told Shah that he'd feel a 'phantom buzzing' that felt like a phone was vibrating and he'd go to answer it. He no longer had a phone in his pocket. (EVEN THOUGH)

3) PURPOSE CLS
You know, the idea that up and coming young people will move to cities, settle there, maybe buy property. City will get the most talented, creative minds. (SO THAT)

PART II – Transform the sentences from active to passive or passive to active where possible.

4) A necklace and earrings were added, and Meg was ready for the party.

5) To encourage a breeze, they are building wind towers, which can draw draughts through the streets without using energy.