The Impact of Data-driven Learning based Program on Developing Student Teachers' Lexico-grammatical Performance Skills in EFL Writing

Heba Moustafa Elmansi

Assistant lecturer at Department of Curriculum & Instruction (TEFL)Faculty of Education, Damietta University

Dr. El-Sayed Mohamad Dadour

Professor of Curriculum & Instruction(EFL) Faculty of Education President of Damietta University

Dr. Aly AbdelSamea Qoura

Professor of Curriculum & Instruction(EFL) Faculty of Education Mansoura University

Dr. Taghreed Ali Hamada

Lecturer of Curriculum & Instruction (EFL) Faculty of Education

Abstract

*T*he research aimed at investigating the impact of data-driven learning based program on developing student teachers' lexico-grammatical performance skills in EFL writing. The participants of the study were sixty (60) second year general section student teachers' in Damietta University, Faculty of Education, Egypt. The research adopted the quasi-experimental research design. So, there were two groups: an experimental group (n= 30) and a control one (n= 30). To collect data, the researcher used multiple instruments: a lexico-grammatical performance skills checklist, an EFL writing skills checklist, computer and internet skills questionnaire, pre-posttest of lexico-grammatical performance skills and an EFL writing test. The researcher taught the experimental group through a program based on DDL while the control group was taught through the regular method of teaching. The results of the research revealed that there was a statistically significant difference between the mean scores of the experimental group and the control group in the lexico-grammatical performance skills and EFL

writing skills in favor of the experimental group. The effect size of the program based on DDL was found to be high. The research recommends using data-driven learning based a program as a technique in teaching EFL skills and as a training method in professional development programs of EFL teachers.
Key Words: Data-driven Learning (DDL), Lexico-grammatical, EFL Writing.

Introduction and background

English is an international language used for communication with others. It contains four skills listening, speaking, reading and writing. There are also three parts in language vocabulary, grammar, and pronunciation should be learnt. Those parts are very important for supporting the English language skills in use especially lexico-grammatical performance skills. Perfectionistic of those parts are reflected on students' writing skills automatically.

Lexico-grammatical theory maintained that language teaching should start from lexis and their core meanings and the most typical collocations in language teaching and learning. Special attention should be paid to that most frequently occurring high-frequency lexis. In this theory, the meaning of word depends on their surrounding lexical items and frequent semantic selective tendency, and the context of the words meaning is constructed by highlighting word's collocation, colligation, semantic preference and semantic prosody. Therefore, acquiring lexico-grammatical performance skills help students to transfer messages, letters and knowledge through writing (Aşık et al 2016& Abu Shawish, 2009).

Learning to write in English as a foreign language has been an essential professional educational issue that serves various educational purposes and meets certain learning

needs upon which the foreign language learners' progress depends (Al-Mansour & Al Shorman, 2014). EFL writing plays an important role in two respects: First, it motivates students' thinking, organizing ideas, developing their ability to summarize, analyze and criticize .Second; it strengthens students' learning, thinking and reflecting on the English language (Rao, 2007; Bruning &Horn, 2000).

Although lexico-grammatical performance skills play an important role in learning and teaching English in general and in EFL writing skills especially, it has not received careful attention. Hence, lack of lexico-grammatical contributes to writing difficulty for foreign language learners. Many studies have shown many problems in English writing such as (Khamis, 2019; Megaiab, 2014& Al-Khairy, 2013; Keong & Mussa 2015; Bahloul, 2007) stated that students' writing difficulties comes from lack of lexical items, grammar, spelling and punctuations errors, illogical sequence and confused on supporting ideas.

Lexical acquisition and knowledge in language teaching has increased, and our understanding of the issues involved in learning new words has deepened. Hence, lexical knowledge and learning becomes a lot more than learning the definition of a word. Metalinguistic awareness includes not only knowing a word dictionary definition, but also includes knowing the word's spelling, morphology, parts of speech, pronunciation, variant meanings, collocations, specific uses, and register related contexts of use (Nation, 2001 & Koda, 2000). In addition to these, Flowerdew (2009) mentions colligation, semantic preference, and semantic prosody.

On the other hand, instructors and supervisors still misunderstand the essence of the lexical items in the writing process .Many of them use traditional approaches based on memorization and drilling (Mostafa et al 2019 & Mourtaga, 2010). Therefore, it is necessary to use modern strategies and approaches to keep up with the age of internet, information, technology, globalization and Corona-Virus. Data-driven learning can offer valuable insights for many of these aspects of knowing a word, particularly because we now understand that these issues are affected by the vocabulary word as well as the surrounding context.

The incorporation of discovery learning and the contemporary revolution of corpus based teaching, Tim John (1991: 2) suggested "Data-Driven Learning (DDL)" as an approach to teaching and learning lexico-grammatical performance skills. In DDL, the focus was shifted from deductive to inductive learning, noticing and consciousness-raising.   DDL was taken through mediational access tool called linguistic corpus in the form of concordance citations that lead to key word on context as language input and self-discovery of lexico-grammatical by learners (Guan, 2013). Whereas traditional language learning materials tended to separate grammar and lexis, DDL fosters a more lexico-grammatical approach. This is facilitated by the use of a concordancer to retrieve commonly-occurring lexico-grammatical patterns for a search item.

Data driven learning allows teachers and students to study naturally occurring language for grammatical patterns, word usage, semantic and pragmatic features, and textual discourse (L, Flowerdew, 2009). Additionally,

authentic language allows for language topics that otherwise might not occur in a textbook or from the examples created in teachers' minds, to be used in vocabulary and grammar discussions. It has traditionally focused on concordance lines, or incomplete sentences that focus on a common word, but new research and corpora have also used lines of texts with expanded context to increase learning possibilities (Boulton, 2009b& Davies, 2008).

Chambers (2010) mentioned that DDL contains two types that refer to Hybrid Learning, hands-on DDL (computer-based DDL) which corresponds to direct corpus consultation and hands-off DDL (paper-based DDL) which is equivalent to indirect corpus consultation. Corpora allow access to authentic data; they reveal knowledge about the language that is not intuitive and show frequency patterns of words and grammar constructions (J. Flowerdew 2009).

Literature Review

Literature review, here, includes studies related to DDL approach and EFL writing and DDL and lexico-grammatical performance skills.

Studies Related to Data-driven Learning and EFL writing

The effect of DDL on writing is tackled from a variety of perspectives including errors correction, enhancement of fluency, complexity and particular tasks of writing. The majority of the empirical studies that have been conducted on issues of DDL and writing tasks agreed that the DDL approach has positive effects on the overall improvement of writing. The most prominent studies that examined the effect of DDL on EFL writing include Mao et al (2018);

Qoura (2018); Ali (2016); Luo (2016); Sepehri (2015); Luo and Lia (2015); Yoon and Jo (2014) & Gilmore (2009). Results of these studies showed certain theoretical guidance to the improvement of the EFL writing level of college students due to DDL.

Studies Related to Data-driven Learning and Lexico-grammatical Performance Skills

Lexical Grammar Theory is an important theoretical contribution for language study. Sinclair (2009) believed that a description of English cannot divide the language into two separate components, lexis and grammar, since grammatical features are decided by lexis and all lexical elements can have grammatical patterns. He observed that lexical meaning and grammatical meaning make up the word meaning as neither can exist without the other and many uses of words and phrases show a tendency to co-occur with certain grammatical choices.

There have been a number of studies on vocabulary, collocations and grammar development through the use of DDL in the two recent decades. Most studies have aimed to investigate the effects of DDL on learners' lexico-grammatical performance skills (Vyatkina, 2016; Mizumoto & Chujo, 2016; Ucar & Yükselir, 2015; Yunus & Awab, 2014; Huang, 2014; Liu & Jiang, 2009; Varley, 2009; Coxhead & Byrd, 2007). The results showed that both DDL types were effective for learners, and overall learner proficiency increased.

Statement of the problem

In light of the previous studies, the pilot studies results and the researcher's experience in teaching student teachers, the problem of the study is that EFL student

teachers' have limited lexico-grammatical performance skills. Moreover, they have difficulties acquiring the language or expressing themselves in a clear, correct and comprehensible manner. These problems may be due to the traditional methods of teaching lexico-grammatical performance skills in EFL classroom where students have a passive learning role. Therefore, the present research is an attempt to solve this problem through using data-driven learning and testing its effectiveness in improving EFL student teachers' lexico-grammatical performance skills.

Research Questions

The present research attempted to answer the following main question:

"How can data-driven learning based program contribute to develop second section student teachers' lexico-grammatical performance skills in EFL writing?"

The main question leads to the following sub questions:

- What are the lexical skills required for the second section student teachers' at the faculty of Education?
- What are the grammatical skills required for the second section student teachers' at the faculty of Education?
- What are the EFL writing skills required for the second section student teachers' at the faculty of Education?
- What are the features of the proposed data-driven learning based a program?
- To what extent can data-driven learning based a program develop second section student teachers' lexico-grammatical performance skills?

- To what extent can data-driven learning based a program develop second section student teachers' EFL writing skills?
- What is the impact of using data-driven learning based a program for developing student teachers' lexico-grammatical performance skills on the development of student teachers' performance in the EFL writing skills?

Purpose of the Research

The present research aims at

- Investigating the impact of using data-driven learning in improving the lexico-grammatical performance skills in the EFL writing of the second section student teachers' at the Faculty of Education.
- Raising students' and researchers' awareness of using innovative methods in teaching lexico-grammatical performance skills in EFL writing.

Significance of the Research

The significance of this research comes through these points:

- Help specialists in organizing an effective teaching learning environment through using data-driven learning approach.
- It helps syllabus designers to modify, organize, and enrich English language curricula with activities based on applying data-driven learning.
- Provide a teacher guide of how to teach by using computer based on DDL and paper based on DDL to

apply Hybrid Learning to improve lexico-grammatical performance skills in EFL writing.

Participants of the Research

A group of 60 second year general stage student teachers' were purposively selected from Damietta University, Faculty of Education, English department in New-Damietta in the academic year 2020/2021. The study targeted selected participants that have computer and internet skills. Students' age ranged from 20 to 21 years old. The participants of this research constituted a homogeneous group in terms of their schooling and English language proficiency. This number of participants was divided equally into two groups. The first group of 30 students comprised the experimental group and received data-driven learning based a program. The other group of 30 students served as the control group and received the regular teaching methods course.

Design of the Research

The design adopted in this research is quasi-experimental design (pretest-posttest). Two groups participated in this research. The first group represented as the experimental group and the second group represented as the control group.

Hypotheses of the Research

The research aimed at testing the following hypotheses:

- There is a statistically significant difference at $\leq$ (0.05) level between the mean score of the experimental group

and that of the control group on the post administration of the lexical performance skills test in favor of the experimental group.

- There is a statistically significant difference at ≤ (0.05) level between the mean score of students of the experimental group on the pre and post lexical performance skills test in favor of the post test.
- There is a statistically significant difference at ≤ (0.05) level between the mean score of experimental group and that of control group on the post administration of the grammatical performance skills test in favor of the experimental group.
- There is a statistically significant difference at ≤ (0.05) level between the mean score of students of the experimental group on the pre and post grammatical performance skills test in favor of the post test.
- There is a statistically significant difference at ≤ (0.05) level between the mean score of experimental group and that of control group on the post administration of the EFL writing test in favor of the experimental group.
- There is a statistically significant difference at ≤ (0.05) level between the mean score of students of the experimental group on the pre and post EFL writing test in favor of the post test.
- Using DDL based program achieves effect size at (≥ 0.14) level for improving student teachers' lexico-grammatical performance skills in EFL writing.

- Developing lexico-grammatical performance skills has an impact on the development of EFL writing performance of the experimental group students.

Instruments and materials of the research

The researcher made use of the following instruments and materials:

- A Program based on Data-driven Learning (Designed by the researcher).
- A Lexical Skills Checklist submitted to a panel of jury to determine its validity and the appropriateness of the skills needed for second year general section student teachers' (Designed by the researcher).
- A Grammar Skills Checklist submitted to a panel of jury to determine its validity and the appropriateness of the skills needed for second year general section student teachers' (Designed by the researcher).
- A Lexical pre-posttest to assess students' lexical performance skills (Designed by the researcher).
- A Grammar pre-posttest to assess students' lexical performance skills (Designed by the researcher).
- An EFL Writing Skills Checklist Skills submitted to a panel of jury to determine its validity and the appropriateness of the skills needed for second year general section student teachers' (Designed by the researcher).
- An EFL Writing Pre-posttest to assess students' writing skills (Designed by the researcher).

- An EFL Writing Rubric to score students' responses to the EFL writing skills test (Designed by the researcher).

Delimitations of the Research

The current study was delimited to:

- Second year general section student teachers in Damietta University, Faculty of Education, English department in the academic year 2020/2021.The participants were chosen by a Computer and Internet Skills Questionnaire.
- A limited duration for implementing the program based on Data-driven Learning (A university semester, i.e., nearly 2 months).
- Fourteen sessions designed by the researcher according to the program based on DDL and each session included three lessons.
- Some lexico-grammatical performance skills and EFL writing skills required for second year general section student teachers.

Results of the Study

Results of the study are presented in terms of the study hypotheses.

Results of hypothesis 1:

The first hypothesis stated that "there is a statistically significant difference at $\leq$ (0.05) level between the mean score of the experimental group and that of the control group on the post administration of the lexical test in favor of the experimental group". The researcher used Independent samples t-test to verify this hypothesis. Table (1) shows the results:

Table (1): Comparing the Performance of the Experimental and the Control Group on the pre-post administration of the lexical test

Lexical Skills	Study groups	Mean	SD	t-test		
				t	DF	P-value
Skill1	Experimental group	4.57	0.50	16.34	58	0.001
	Control group	2.27	0.58			
Skill2	Experimental group	9.03	0.76	24.48	58	0.001
	Control group	4.70	0.60			
Skill3	Experimental group	4.60	0.50	14.65	58	0.001
	Control group	2.13	0.78			
Skill4	Experimental group	4.33	0.66	12.06	58	0.001
	Control group	2.03	0.81			
Skill5	Experimental group	1.70	0.47	5.03	58	0.001
	Control group	1.03	0.56			
Skill6	Experimental group	4.47	0.68	12.29	58	0.001
	Control group	1.87	0.94			
Skill7	Experimental group	4.23	0.82	10.04	58	0.001
	Control group	1.97	0.93			
Skill8	Experimental group	4.37	0.61	17.30	58	0.001
	Control group	1.47	0.68			
Skill9	Experimental group	2.63	0.49	14.23	58	0.001
	Control group	0.97	0.41			
Skill10	Experimental group	9.33	0.71	20.15	58	0.001
	Control group	5.23	0.86			
Lexical test	Experimental group	49.27	1.86	42.31	58	0.001
	Control group	23.67	2.75			

Table (1) reports that the mean score of the experimental group was higher than that of the control group in all skills of the lexical test and in the total score of the test. The results also reveal that the mean score of the different lexical skills have been enhanced. The ″t″ value of the skills ranged between (24.48- 5.03), all of which are statistically significant at (0.001). Whereas, the mean score of the experimental group students in the post administration of the whole test were (٤٩.٢٧) and the control group were (23.67). The value of ″t″ of the test was (42.31). Therefore, the results pointed to that there is a statistically significant difference at (0.001) between the mean score of the experimental group and that of the control group in all skills in favor of the experimental group.

Results of hypothesis 2:

The second hypothesis stated that "there is a statistically significant difference at ≤ (0.05) level between the mean score of students of the experimental group on the pre and post lexical skills test in favor of the posttest". To verify this hypothesis, Paired samples t-test was used to calculate the difference between the experimental group performance on the pre and that on the post application of the lexical test. The results are presented here in table (2)

The results in table (2) indicate that the mean score of the experimental group was higher in the post administration of the lexical test than that of the pre administration of the test.

**Table (2): Comparing the Experimental Group Performance on
the Pre and Post Administration of the Lexical Test**

Lexical Skills	Test	Mean	SD	t-test		
				t	DF	P-value
Skill1	Pre-test	1.23	0.68	21.63	29	0.001
	Post-test	4.57	0.50			
Skill2	Pre-test	3.10	1.21	23.01	29	0.001
	Post-test	9.03	0.76			
Skill3	Pre-test	1.77	0.77	15.22	29	0.001
	Post-test	4.60	0.50			
Skill4	Pre-test	1.67	0.84	15.84	29	0.001
	Post-test	4.33	0.66			
Skill5	Pre-test	0.53	0.51	9.87	29	0.001
	Post-test	1.70	0.47			
Skill6	Pre-test	0.63	0.56	25.18	29	0.001
	Post-test	4.47	0.68			
Skill7	Pre-test	1.43	0.73	13.61	29	0.001
	Post-test	4.23	0.82			
Skill8	Pre-test	1.53	0.94	15.75	29	0.001
	Post-test	4.37	0.61			
Skill9	Pre-test	1.37	0.76	9.38	29	0.001
	Post-test	2.63	0.49			
Skill10	Pre-test	1.50	0.94	34.77	29	0.001
	Post-test	9.33	0.71			
Lexical test	Pre-test	14.77	2.49	58.80	29	0.001
	Post-test	49.27	1.86			

The value of the "t" test was (58.80) which point to a statistically significant difference at (0.001) between the mean score of the experimental group students on the pre-post administration of lexical test in all skills in favor of the post administration.

Results of hypothesis 3:

The third hypothesis stated that "there is a statistically significant difference at ≤ (0.05) level between the mean score of the experimental group and that of the control group on the post administration of the grammar test in favor of the experimental group". The researcher used Independent samples t-test to verify this hypothesis. Table (3) shows the results:

Table (3): Comparing the Performance of the Experimental and the Control Groups on the Post Administration of the Grammar Test

Grammar Skills	Study groups	Mean	SD	t-test		
				t	DF	P-value
Identify parts of speech in sentences	Experimental group	18.13	0.90	25.09	58	0.001
	Control group	11.40	1.16			
Identify the grammatical units of English, sentences	Experimental group	15.07	0.83	24.18	58	0.001
	Control group	9.43	0.97			
Grammar test	Experimental group	33.20	1.16	33.44	58	0.001
	Control group	20.83	1.66			

The mean score of the experimental group was higher than that of the control group in all skills of the grammar test and in the total score of the test as it was reported by table (3). The results also reveal that the mean score of the individual grammar skills have been enhanced. The mean score of the experimental group students in the post administration of the whole test were (33.20) and the control groups were (20.83). The value of ″t″ of the test was (33.44). The results pointed to a statistically significant difference at (0.001) between the mean score of the experimental group and that of the control group in all skills in favor of the experimental group.

Results of hypothesis 4:

The fourth hypothesis stated that "there is a statistically significant difference at ≤ (0.05) level between the mean score of students of the experimental group on the pre and post grammar skills test in favor of the posttest". To verify this hypothesis, the Paired samples t-test was used to calculate the results presented in table (4)

Table (4) indicates that the mean score of the experimental group was higher in the post administration of the grammar test than that of the pre administration of the test. The value of ″t″ test was (73.47) which refer to a statistically significant difference at (0.001) between the mean score of the experimental group students on the pre-post administration of grammar test in all skills in favor of the post administration.

Table (4): Comparing the Experimental Group Performance on the Pre and Post Administration of the Grammar Test

Grammar Skills	Test	Mean	SD	t-test		
				t	DF	P-value
Identify parts of speech in sentences	Pre-test	6.27	0.94	44.64	29	0.001
	Post-test	18.13	0.90			
Identify the grammatical units of English, sentences structure and sentence concepts	Pre-test	4.93	0.69	50.19	5829	0.001
	Post-test	15.07	0.83			
Grammar test	Pre-test	11.20	1.16	73.47	29	0.001
	Post-test	33.20	1.16			

Results of hypothesis 5:

The fifth hypothesis stated that "there is a statistically significant difference at ≤ (0.05) level between the mean score of the experimental group and that of the control group on the post administration of the EFL writing test in favor of the experimental group". The researcher used Independent samples t-test to verify this hypothesis. Table (5) illustrates the results:

Table (5): Comparing the Writing Performance of the Two Groups on the post Administration of the EFL writing test

Skills	Study groups	Mean	SD	t-test		
				t	DF	P-value
Pre-writing	Experimental group	24.33	1.54	18.27	58	0.001
	Control group	16.03	1.96			
During-writing	Experimental group	11.80	1.49	11.49	58	0.001
	Control group	7.10	1.67			
Post-writing	Experimental group	10.53	0.68	10.37	58	0.001
	Control group	6.27	2.15			
Writing test	Experimental group	46.67	2.38	26.77	58	0.001
	Control group	29.40	2.61			

The results in table (5) indicate that the mean score of the experimental group was higher than that of the control group in all skills of the EFL writing test and in the total score of the test. It is worth noting that the mean score of the experimental group students in the whole test were (46.67) compared to the control group were (29.40). The value of ″t″ of the test was (26.77). The results pointed to a statistically significant difference at (0.001) between the mean score of the experimental group and that of the control group in all skills in favor of the experimental group. These results mean that using the program based on DDL was effective in enhancing lexico-grammatical performance skills and this is reflected on the performance of the students in the EFL writing.

Results of hypothesis 6:

The sixth hypothesis stated that "there is a statistically significant difference at ≤ (0.05) level between the mean score of students of the experimental group on the pre and post EFL writing skills test in favor of the posttest". The results are presented in table (6)

Table (6): Comparing the Experimental Group Performance on the Pre and Post Administration of the Writing Test

EFL Writing Skills	Test	Mean	SD	t-test		
				t	DF	P-value
Pre-writing	Pre-test	9.23	3.08	25.94	29	0.001
	Post-test	24.33	1.54			
During-writing	Pre-test	4.33	2.01	18.14	29	0.001
	Post-test	11.80	1.49			
Post-writing	Pre-test	3.20	1.10	32.36	29	0.001
	Post-test	10.53	0.68			
Writing test	Pre-test	16.77	2.92	49.40	29	0.001
	Post-test	46.67	2.38			

Results in table (6) show that the experimental group performance in the post administration of the writing test was better than that of the pre-administration. The mean score on the post one was (46.67) compared to (16.77) in the pre administration.

Results and discussion related to the effect size of DDL based program

The seventh hypothesis stated that "using DDL achieves effect size at (≤ 0.14) level for improving student teachers' lexico-grammatical performance skills in EFL writing".

To calculate the effect size of the independent variable (teaching using a program based on DDL) on the dependent variable (lexico-grammatical performance skills in EFL writing), the (η2) value was calculated as presented in table (7):

Table (7): the effect size of using a program based on DDL on the experimental group lexico-grammatical performance skills in EFL writing

Dependent Variables	T	DF	Eta square (η^2)	Effect size
Lexical skills	58.80	29	0.992	Large
Grammar skills	73.47	29	0.995	Large
Writing skills	49.40	29	0.988	Large

Results in table (7) indicate that the effect size (η2) of the program based on DDL on the lexico-grammatical performance skills in EFL writing was arranged respectively (0.992-0.995-0.988). This illustrates the effectiveness of using a program based on DDL in improving the experimental group student teachers' lexico-grammatical performance skills in EFL writing.

Results of hypothesis 8:

The eighth hypothesis stated that "developing lexico-grammatical performance skills has an impact on the development of EFL writing performance of the experimental group students". To test this hypothesis, the researcher used the multiple linear regression method. The results are shown in the following table:

Table (8): the effect size of developing lexico-grammatical performance skills on the development of EFL writing performance on the experimental group students

	Sum of Squares	df	Mean Square	F	P-value
Regression	81.92	2	40.96		
Residual	82.74	27	3.06	13.37	0.001
Total	164.67	29			

Table (8) reveals that there is a good effect for the lexico-grammatical performance skills on the performance of student teachers' EFL writing skills on the experimental group. The ″f″ value was (13.37) and statistically significant at (0.001). The results indicate the regression coefficients and its significance as shown in the following table:

Table (9): the regression coefficients and its significance

	B	t	P-value
(Constant)	3.04	0.31	0.755
Lexical skills	0.23	3.55	0.001
Grammar skill	0.97	3.45	0.002

Table (9) reveals the values of regression model and its significance. The results illustrate that all the values were statistically significant in the lexico-grammatical

performance skills. The performance of EFL writing can be predicted from the following formula: EFL Writing Performance= (0.23) Lexical Skills + (0.97) Grammar Skills + (3.04) From Table (8 & 9)

Discussion of the Research Results

The results revealed that most of the participants evidently had a positive attitude towards the DDL approach as it is considered to be a useful resource to acquire lexico-grammatical in order to improve EFL writing. In particular, almost all of the participants thought that their lexico-grammatical performance skills was enhanced by applying the program through the DDL approach as it helped them understand the lesson and be able to apply lexico-grammatical skills in the real context and in the writing process.

The research revealed that DDL can be an effective tool to learn lexico-grammatical performance skills and this improvement is reflected on student teachers' performance in the EFL writing especially on the advanced level of EFL acquisition. This research is supported by literature (Noguera-Díaz & Pérez-Paredes, 2020; Römer, Viviana & Eric, 2020 ; Qoura, 2018; Ali, 2016) that establish evidence that the DDL approach has several advantages for language learners. For example learners take an active role in working through an extensive language material independently which consolidate their anatomy. Exposure to authentic language input make learners more sensitive towards language variation. In addition, discovery learning

is enhanced because using data-driven is an inquiry-based activity and opposes explicit instruction by the teacher. Finally, using data-driven learning access such as BNC, COCA and CANCODE helped learners to make their own judgment about the meaning of lexico-grammatical items.

Results of the current research are in line with those of (Noguera-Díaz & Pérez-Paredes, 2020; Römer, Viviana & Eric, 2020; Qoura, 2018; Mao et al, 2018; Yılmaz, 2017; Barabadi & Khajavi, 2017; Nugraha et al, 2017; Mizumoto & Chujo, 2016; Ali, 2016; Luo, 2016; Sepehri, 2015; Ucar & Yükselir, 2015; Sah, 2015; Yoon & Jo, 2014 which reported the effectiveness of program DDL based program on developing learners' lexico-grammatical performance skills in EFL writing.

During the implementation of the DDL program the researcher noticed that the results of the current research indicated the verification of the previous hypothesis and the high value of the experimental treatment's effect size upon the overall lexico-grammatical performance skills in EFL writing. Some student teachers of the experimental group expressed their positive attitudes towards data-driven learning based program.

Conclusions

A number of conclusions were derived from the current research.

- Applying DDL helps student teachers' to feel more confident to formulate their own findings. It proved suitability for different learners' styles especially

kinesthetic. It has a positive effect on student teachers' through using hands on DDL and hands off DDL.

- Applying DDL approach in learning showed that the more students are exposed to authentic data, the less possibility and the negative transfer occurs as authenticity reduces negative transfer and brings unnatural English to the minimum. Also, DDL approach helped to reduce the gap of studying English as a foreign language in Egypt where students are often exposed to pedagogical pre-fabricated data rather than authentic data.

- Using computer based DDL and paper-based DDL approach in teaching lexico-grammatical performance skills gives students a chance to notice and build up rules as it enhances their understanding of lexico-grammatical in EFL writing as a description of the actual language.

- DDL program proved that it is more suitable for student teachers' level because of the huge amount of data the students need to be exposed to. Hence, it is unsuitable for lower level learners.

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