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## The Effect of Data-Driven Learning of Grammar on Georgian EFL University Students' Grammar Achievement

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### Abstract

The purpose of this study is to investigate the effect of Data-Driven Learning of grammar on Georgian English as a Foreign Language (EFL) University students' grammar achievement. The study used a quasi-experimental research design with a quantitative approach. The sample of the research was 44 Georgian EFL students of Sokhumi State University, divided into experimental and control groups with 22 students in each. The experimental group was instructed English grammar using the Data-Driven Learning method and the control group was taught by conventional, explicit grammar teaching approach. The result of the paired-samples T-test showed that there was a significant difference in the scores for the control group ( $M=62.13$ ,  $SD=14.46$ ) and experimental group ( $M=1.5$ ,  $SD=0.58$ ) conditions;  $t=8.3$ ,  $df=3$ , significance  $p=0.003<0.05$ . Thus, the difference between control and experimental group achievements was statistically valuable, Data-Driven group students achieved significantly higher results than the traditional teaching group students. A questionnaire was applied to evaluate experimental group students' perceptions of the Data-Driven Learning method. The results showed that students felt positive about the DDL method. Based on students' achievements and evaluation of the method, it can be inferred that Data-Driven Grammar Learning is an effective grammar instruction method. It builds a student-centered learning environment with improved classroom interaction, enhanced autonomous learning, and increased student engagement. It offers real-life language exploration possibilities and a skills-oriented grammar

teaching process.

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**Keywords:** Data-Driven Learning, EFL grammar, student-centered learning, active learning

## **Introduction**

In the Georgian higher education EFL (English as a Foreign Language) context, grammar instruction is generally carried out through the deductive approach. The deductive approach to grammar teaching constitutes a teacher-centered method, the teacher transmits all information to students - provides grammar rules and explanations, and then, the students apply the rules to specific examples. In this way, the learners are passive recipients of the knowledge. Technological advances of the past decades originated a new field – corpus linguistics. The development of corpus linguistics emerged new trends in language education. Corpus-based teaching creates new opportunities for language teaching including grammar and offers transformation of traditional teaching into active, student-centered, constructivist learning.

## **Literature Review:**

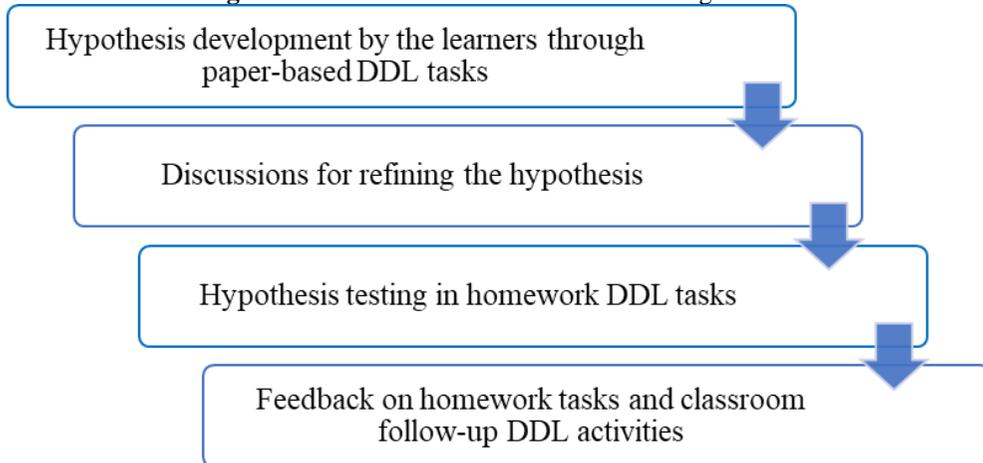
According to Reppen (2010), a corpus is “a large, principled collection of naturally occurring texts (written or spoken) stored electronically (p. 23). Corpus linguistics denotes corpus-based language studies. It emerged in the 1950s. The potential and benefits of corpora for language education have been soon recognized and gained increasing attention among scholars and teachers. Applying a corpus in language instruction started in the 1980s. The exploitation of a corpus for language teaching is referred to as Data-Driven Learning. The concept of Data-Driven Learning (DDL) was coined by Johns (1990).

Corpus has two kinds of application in the foreign language classroom: indirect application by the learners - the teacher designs corpus-based materials for students and the students detect the language patterns in these resources, or direct application – the students interact with corpus software where they investigate the language. Thus, there is paper-based or computer-based/hands-on Data-Driven Learning (Brown, 2017; Elsherbini & Ali 2017). In the DDL activities, learners have the role of researchers, they examine the data on a specific language feature, categorize the data, make a generalization based on the evidence and draw conclusions. Corpora make it available to do both quantitative and qualitative analysis of language patterns. Learners can get a frequency of occurrence of the target feature in the corpus as well as investigate its use in authentic contexts (O’Keeffe, McCarthy & Carter, 2007).

Learners can observe and analyze grammatical structures as well as lexicogrammatical patterns.

Chujo and Oghigian (2008) developed a Data-Driven Grammar Learning method, shown in figure 1.

**Figure 1 :** The Data-Driven Grammar Learning method



Source: Chujo and Oghigian, 2008.

In the first step, students are provided with paper-based DDL tasks. Students in pairs or groups observe the presented concordance lines on a particular grammar point and develop a hypothesis on the formation and use of this target grammar point. In the second step, the teacher gives some explanations or clarifications that allow students to improve or confirm their hypotheses. In the third step, students test the hypothesis in homework DDL tasks prepared by the teacher, and in the final step, the teacher provides feedback on completed homework tasks and some practice continues through classroom activities.

Data-Driven Learning has many advantages. First of all, through corpora students can explore the language in authentic contexts. Students become familiar with real-language examples.

The Data-Driven Learning method induces active learning in class (Chambers, 2010; Lee 2011). Students carry out investigations on language features. Data-Driven Learning is a constructivist teaching method (Boulton & Cobb, 2017; Lili, 2015). It focuses on building knowledge by the learners rather than passively transmitting the knowledge to them. Students “work independently or collaboratively to observe, analyze, and interpret patterns of language use” (Huang, 2008, p. 21). DDL activities foster interaction in class among the students and the students and the instructor as well (Meunier, 2002).

The Data-Driven Learning method transforms the roles of the teacher as well as students. In the established student-centered environment, students

perform as researchers, whereas the teacher acts as a facilitator (Huang, 2018; Kazuko, 2014). Data-Driven Learning encourages students' autonomy (Sah, 2015; Zhang & Liu, 2014).

The Data-Driven Learning method facilitates the development of higher-order thinking skills of students. Numerous cognitive skills are involved in Data-Driven Learning, e.g. "predicting, observing, noticing, thinking, reasoning, analyzing, interpreting, reflecting, exploring, making inferences (inductively or deductively), focusing, guessing, comparing, differentiating, theorizing, hypothesizing, and verifying" (O'Sullivan, 2007, p. 277).

Data-Driven Learning is often considered to be appropriate for advanced language learners. Though, there are scholars who claim DDL relevance to all levels of language proficiency. For example, Al-Gamal and Ali (2019) assert that the corpus-based teaching method is beneficial for all levels of students' language proficiency. Moreover, there are studies (e.g., Boulton, 2008; Chujo, Utiyama & Miura, 2006; Takahashi & Fujiwara, 2016; Yunus, 2014) that proved the effectiveness of Data-Driven learning on elementary language level students as well.

## **Research Methodology:**

### **The design of the study**

This study used a quasi-experimental research design. A quantitative research method was applied in it. The research sought to investigate the following research questions: 1) How effective is Data-Driven Learning of grammar on EFL University students' grammar achievement? 2) What are the attitudes of the experimental group students toward the Data-Driven Grammar Learning method?

The population of this research was the first-year students of the faculty of Education Sciences of Sokhumi State University, Tbilisi, the capital of Georgia. They were taking English as a Foreign Language as a compulsory course in their majors. There were four groups of freshmen students, with a total number of 100 students, at the faculty of Education Sciences in the academic year 2020-2021. Out of four groups, two groups, with 22 students in each, were selected as a sample. The purposive sampling technique was used in the selection of these two groups – students of both groups were similar in English ability level. One group (consisting of 16 females and 6 males) was assigned as an experimental group, the other one (consisting of 15 females and 7 males) as a control group. So, the total sample of this research was 44 EFL students. Their ages ranged from 18-20 years. Their proficiency level of English was B1.

## **Treatment**

The treatment was given to both, experimental and control groups. The experimental (DDL) group was instructed grammar through the four-step Data-Driven Grammar Learning paradigm developed by Chujo and Oghigian (2008). Data-Driven Learning tasks provided by the teacher at the first step of learning included original concordance lines on a particular grammar point in KWIC (Key Words in Context) format taken from Corpora at CQPweb of Lancaster University (Hardie, 2012), in particular British National Corpus (XML Edition), Brown Family (extended) and BNC sampler. The concordance lines were followed by the leading questions students needed to focus on when forming hypotheses. Data-Driven Learning tasks developed by the teacher for homework or classroom follow-up activities at the third and fourth steps of the paradigm were of different types: multiple-choice, gap-filling, Matching, True/False, error correction, transformation, close/open-ended, etc. Primarily, in all DDL tasks, original concordance lines were maintained, occasionally they were adopted to students' language proficiency level.

The control (traditional teaching) group was an explicit instruction group, learning grammar deductively. The teacher provided rules and explanations on a specific target grammar point and then the students applied those rules to different instances. *LASER BI* (Mann & Taylore-Knowles, 2013) was used to teach target grammar points to the control group.

The treatment lasted 8 weeks, 16 contact hours in total. Grammar points taught to the experimental and the control group were identical. These were: countable and uncountable nouns, comparatives and superlatives, modals, time clauses, and relative clauses.

## **The research tools**

Two research tools – tests (pre and post-tests) and a questionnaire were developed to achieve the objectives of the study. Ordinary, non-DDL grammar tests were created for research: the pre-test aimed to evaluate students' grammatical knowledge before treatment, the post intended to measure students' achievements after treatment. The questionnaire was designed to evaluate students' attitudes towards the experimental method. The tests comprised 50 questions on the target grammar points in multiple-choice format. The questionnaire included close-ended questions. There were 10 items in the questionnaire. They followed the five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree).

For ensuring the validation of the pre and post-tests and the questionnaire, their content validity, and face validity were checked. Content and face validity were assessed by 3 qualified specialists in the fields of English Philology and Education Sciences. For verifying the reliability of the

research tools, the tests and the questionnaire were piloted within a group of 10 students. Their reliability was measured with test-retest correlation. For the pre-test, Pearson correlation was 0.997 and the significance was  $p=0.000<0.01$ ; and for the post-test, the correlation was 0.998 and the significance was  $p=0.000<0.01$ . As for the questionnaire, the Pearson correlation was 0.934 and the significance was  $p=0.000<0.01$ . The piloting results of the tools demonstrated that in all three cases, Pearson correlation was higher than 0.08 and the significance was below 0.01 which means that in each case there was a strong correlation between the two results, the results were statistically significant and the tools (pre-test, post-test, and questionnaire) were reliable.

### **The procedures of gathering and analyzing data**

The data was gathered by using the pre-test, post-test, and questionnaire. The pre-test was administered to the experimental and control group students before treatment to evaluate the students' grammatical knowledge before treatment was given. The post-test was administered to the students of both groups after treatment to find out what achievements the students obtained. In addition to the post-test, the questionnaire was given to the experimental group students to evaluate their perceptions of the Data-Driven Learning method. The results of the tests and the questionnaire were prepared for analysis.

SPSS 22.0 statistics program was used for analyzing the data of the research. Through the program, the mean, median, mode(s), and standard deviation of the groups' results were calculated. To see how significant the differences between groups were t-test was applied. The results of the questionnaire were also analyzed using the SPSS program.

### **Results and Discussions:**

Students' test results and descriptive analyses of the results are shown in Table 1 and Table 2.

**Table 1 : Control group**

Student	Pre-test	Post-test
Student 1	73	82
Student 2	52	68
Student 3	54	70
Student 4	46	56
Student 5	61	78
Student 6	36	58
Student 7	56	75
Student 8	62	80
Student 9	52	63
Student 10	42	63
Student 11	51	70
Student 12	53	78
Student 13	75	86
Student 14	45	62
Student 15	47	69
Student 16	43	61
Student 17	45	67
Student 18	43	62
Student 19	37	52
Student 20	34	59
Student 21	55	71
Student 22	45	63
Mean	50.32	67.86
Median	54.5	69
Mode(s)	45	63
St. Deviation	10.68	9.02

**Table 2 : Experimental group**

Student	Pre-test	Post-test
Student 1	63	89
Student 2	45	69
Student 3	51	74
Student 4	77	98
Student 5	41	78
Student 6	53	85
Student 7	35	67
Student 8	44	75
Student 9	74	97
Student 10	46	82
Student 11	53	79
Student 12	37	71
Student 13	44	79
Student 14	52	86
Student 15	55	84
Student 16	57	84
Student 17	61	91
Student 18	39	67
Student 19	54	80
Student 20	40	75
Student 21	42	72
Student 22	46	77
Mean	50.41	79.95
Median	56	82.5
Mode(s)	44, 46 and 53	67, 75, 79 and 84
St. Deviation	11.11	8.77

Source: Developed by the author.

No significant difference was found between the mean scores of the experimental and control groups in the pre-test. The experimental group received a slightly higher result than the control group (M=50.41 vs M=50.32), therefore it is completely safe to say that the two groups were quite equivalent in grammatical knowledge on intended grammar points before the treatment. Standard deviation values show that both groups were quite heterogeneous in terms of participants' knowledge. The most frequently occurring scores in the test results of each group are also given in the tables.

**Table 3 : Summary for t-test**

Test	Control group	Experimental group
Pre-test	50.32	50.41
Post-test	67.86	79.95

Source: Developed by the author

From Table 3 we can see that both groups achieved higher scores in the post-test than in the pre-test. To be more specific, for the control group, the mean score of the post-test was 67.86 compared with 50.32 of the pre-test; and for the experimental group, the mean score of the post-test was 79.95 compared with 50.41 of the pre-test.

To find out whether this difference between the means was statistically significant, a paired-samples t-test was held, as shown in the tables below.

**Table 4 : Paired samples statistics**

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1				
Control group	62.1350	4	14.45936	7.22968
Experimental group	1.5000	4	.57735	.28868

*Source: Developed by the author.*

**Table 5 : Paired samples test**

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Control group – experimental group	6.06350E1	14.32992	7.16496	37.83290	83.43710	8.463	3	.003

*Source: Developed by the author.*

A confidence interval of the difference was 95%. The results showed that there was a significant difference in the scores for the control group (M=62.13, SD=14.46) and experimental group (M=1.5, SD=0.58) conditions; t=8.5, df=3, significance p=0.003<0.05, which means that the difference between control and experimental group achievements is statistically significant. Thus, the results of the study displayed that Data-Driven Grammar Learning was an effective grammar teaching method and students of the DDL group achieved significantly higher results than those of the traditional teaching group.

The questionnaire applied to the experimental group of students is shown in Table 6.

**Table 6:** Questionnaire for the experimental group students

Statements	1=Strongly disagree; 2=Disagree; 3=Neither disagree nor agree; 4=Agree; 5=Strongly agree				
1. The Data-Driven Grammar Learning method was an interesting and motivational method for learning English grammar well.	1	2	3	4	5
2. The Data-Driven Grammar Learning method transformed the classroom into an active learning environment.	1	2	3	4	5
3. Data-Driven Learning of grammar was fun.	1	2	3	4	5
4. Discovering grammatical features on my own was a more valuable experience than receiving all the information from my teacher.	1	2	3	4	5
5. The Data-Driven Grammar Learning method enhanced classroom interaction (among students, between the student and the teacher, and the teacher and the student)	1	2	3	4	5
6. Exploring the language in authentic contexts was a meaningful learning experience.	1	2	3	4	5
7. The Data-Driven Grammar Learning method generated a skills-based grammar learning process.	1	2	3	4	5
8. The Data-Driven Grammar Learning method promoted autonomous learning.	1	2	3	4	5
9. The inclusion of pair and group work in grammar teaching boosted my engagement in grammar learning.					
10. I would like to continue learning English grammar through the DDL method.	1	2	3	4	5

*Source: Developed by the author.*

Table 7 shows the statistical analysis of the results for each Likert-scale item.

**Table 7 :** Statistic results of the questionnaire

	Mean	Median	Mode	Standard Deviation
Item 1	4.27	4	4	0.63
Item 2	4.64	4	5	0.58
Item 3	4.04	3	5	1.25
Item 4	3.73	3	4	1.28
Item 5	4.45	3.5	5	0.8
Item 6	3.95	3	4	1.13
Item 7	4.5	4	5	0.67
Item 8	4.04	3	4	1.04
Item 9	4.59	4	5	0.59
Item 10	3.95	3	4	1.13

*Source: Developed by the author.*

As illustrated, the items of the questionnaire received high results. The lowest mean value was 3.73 and the highest one was 4.64. The results demonstrated that the students' evaluations of the new method were positive, they turned out to have positive attitudes towards each component of the Data-Driven Learning method. The mean to be quite trustworthy has to be close to the median and the mode and in the results of this questionnaire, the mean values were more or less close to the median and mode values. Standard deviation values revealed that the answers to statements 1, 2, 5, 7, and 9 are relatively homogenous while others are more heterogeneous. The mode values indicate that the answers "Agree" or "Strongly agree" dominated in students' responses.

To be more specific, the questionnaire results revealed that 90.90% of students found the DDL method as an interesting and motivational grammar learning method. For 95.45% of students, an active learning environment was created by the DDL method. 81.81% of students found learning grammar through the DDL method fun. 68.18% of students valued discovering grammatical features by themselves as a more valuable learning experience than receiving all information from the teacher. 90.90% of students agreed that the Data-Driven Grammar Learning method enhanced classroom interaction. For 77.27% of students, the exploration of grammatical features in authentic contexts was a meaningful learning experience. 90.90% of students accepted that the Data-Driven Learning of grammar was a skills-oriented grammar teaching method. 81.81% of students approved that the Data-Driven Grammar Learning method promoted autonomous learning. 90.90% of students agreed that collaborative learning increased their involvement in grammar learning. 77.27% of students expressed a willingness to continue EFL grammar studying through the Data-Driven Learning method.

To sum up, the findings on research question 1 "How effective is Data-Driven Learning of grammar on EFL University students' grammar achievement?" revealed that the Data-Driven Grammar Learning method was more effective than the traditional, deductive grammar teaching approach. The questionnaire results on research question 2 "What are the attitudes of the experimental group students toward the Data-Driven Grammar Learning method?" revealed that the students felt positive towards the Data-Driven Grammar Learning method.

The results of the presented study are in line with the findings of Nugraha, Miftakh, and Wachyudi (2016). The study conducted by Nugraha, Miftakh, and Wachyudi revealed that Indonesian University students had positive attitudes toward the overall Data-Driven Learning method developed by Chujo and Oghigian (2008) and each component of it: DDL worksheet, grammar explanation provided by the teacher, follow-up activities, and feedback from the teacher.

The results of the introduced study also coincide with the outcomes of Wang (2018). The study conducted by Wang showed that corpus-based grammar teaching had a significantly positive effect on Chinese EFL University students' grammar skills. Class observation and interviews revealed that corpus-based grammar teaching increased students' motivation to learn.

The results of this research are also consistent with the findings of Abdul-Ameer (2019). According to the study conducted by Abdul-Ameer, Iraqi EFL University students showed successful performance on each stage of the Data-Driven Learning model created by Chujo and Oghigian (2008). Students showed satisfaction with the integration of DDL activities in grammar learning and expressed positive attitudes towards each step they underwent.

## Conclusion

This study explored the effect of Data-Driven Learning of grammar on Georgian EFL learners' grammar achievement. The outcomes of the research revealed that Data-Driven Learning was an effective method for the acquisition of grammatical knowledge by the University EFL students. Student questionnaire results showed that students were very positive towards the Data-Driven Grammar Learning method. Based on the findings, it can be concluded that Data-Driven Grammar Learning is an effective grammar teaching method. It revolutionizes the teaching of grammar: promotes the transformation of teacher-centered education to student-centered learning, generates constructivism-based active learning, promotes autonomous learning and increased student engagement, and proposes a skills-oriented, real-language-based grammar learning process. The findings of the present study will bring a new perspective to EFL grammar teaching in Georgia. The study results will encourage EFL teachers to start significant shifts in grammar teaching methodology and move towards student-driven, technology-enhanced authentic learning.

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