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The Role of Data-Driven Learning and Traditional Instruction of Vocabulary in an English as a Foreign Language (EFL) Context (in Secondary School)

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Extended abstract of Ph.D. dissertation in Education Sciences

Tbilisi 2015

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Introduction

Just like Laufer (1986) and Nation (1990), Wilkins (1972) expressed an opinion that "while without grammar very little can be conveyed, without vocabulary nothing can be conveyed" (p. 23). Meara (1980) also found the lack of vocabulary as one of the biggest difficulties among second language learners.

Vocabulary has a great role in language skills. As Folse (2004, p. 26) argues, "people can generally communicate their meaning with less than perfect grammar whereas incorrect vocabulary can substantially impede communication". Vocabulary teaching is an important component in language teaching, and it plays a key role in learning a new language. However, teaching vocabulary to second/foreign language (L2) students is one of the main difficulties of teachers.

Until the last two decades, teaching vocabulary was just thought to have a great facilitative effect or it was viewed like "appendage" while teaching a language with its important components like grammar (Irvin, 1990). In addition to this, DeCarrico (2001, p. 285) states that "vocabulary has not always been recognized as a priority in language teaching".

After the 1980s, vocabulary has become the area of interest of many investigators (Laufer, 1986; Carter, 1988; Nation, 1990; Descamps, 1992; Nattinger & DeCarrico, 1992). It has been concluded that, as a result of inadequate vocabulary, learners face difficulties in receptive skills (listening and reading) and productive skills (speaking and writing) (Laufer, 1986; Nation, 1990).

The past thirty years have seen increasingly rapid advances in the field of teaching vocabulary. So, there have been lots of debates about how to teach and which methods are best for learners to learn and acquire new vocabulary. One of the best ways of acquiring new words and enriching one's vocabulary, like in the native language (L1), is by extensive real-world experience (Krashen, 1982). However, a second/foreign language is mostly learned in a classroom atmosphere, as it is part of the curriculum of schools. According to Watts (1995), the curriculum in schools does not permit to dedicate enough time to teaching vocabulary. In spite of the lack of emphasis, there has been quite much research which helped teachers to have more information about the importance of vocabulary learning.

Learners may gain proficiency in some language skills in a relatively short time, but learning vocabulary is a life-long process. In one of the studies, Tabatabaei and Goojani (2012,

p.47) emphasize that the acquisition of vocabulary is the biggest challenge among students. In another study, Hiebert and Kamil (2005) state that "vocabulary is not a developmental skill or one that can ever be seen as fully mastered. The expansion and elaboration of vocabularies is something that extends across a lifetime" (p. 2).

As we live in technology-integrated life and as most of the learners enjoy learning using technology, they have to be used to teach vocabulary to make its acquisition more motivated and efficient.

Corpus Linguistics has been applied in language teaching for more than three decades. Keeffe, A., McCarthy, M., & Carter, K. (2007) describe corpus as a tool in order to collect either written or spoken, or electronic texts and to store them on a computer for the later qualitative and quantitative use. In the past, the term was generally used for studying the work of art of a unique author, but by the emergence of computers, a great amount of texts from different authors can be kept and analyzed with the help of software.

Data-Driven Learning was introduced as a new language learning strategy especially in vocabulary learning by Tim Johns (1991) so as to make advantage of corpora by means of text analysis programs. Keeffe, A., McCarthy, M., & Carter, K. (2007) describe it as a way "to find every occurrence of a particular word or phrase" (p. 8). In other words, in DDL, the information in corpus is presented by means of concordance lines (Tribble and Jones, 1997) in which a particular word or phrase is listed in all sentences vertically, usually with a few words to the left and right.

Although Data-Driven Learning has been acknowledged by many researchers with many benefits as being student-centered, portable, discovery-based, deductive etc., there are few studies showing real-life usage of it. Boulton (2007) found only five studies which aim to empirically evaluate language learning using DDL. He also highlighted that these studies were implemented to postgraduate students. This is why the empirical study in this dissertation has an urgent and important role in finding out whether Data-Driven Learning contributes to vocabulary learning in high schools. All this reveals the **significance** of the research topic.

Irrespective many improvements in vocabulary teaching that have occurred during the last 3 decades, students still have difficulties in learning vocabulary and are not very motivated to work hard to overcome them. Thus, the **problem** of the research is the urgent necessity of improvement of vocabulary learning. Another essential problem is that language teachers are often unaware of

the contemporary technologies that can help them or, even if aware, they think them too difficult to be used.

The **goal** of my doctoral dissertation was to find out:

- ✓ Whether Data-Driven Learning has benefits in vocabulary learning
- ✓ Whether Data-Driven Vocabulary Learning is more effective than the traditional way of vocabulary teaching
- ✓ Whether Data-Driven Vocabulary Learning would foster students' autonomy
- ✓ Whether Data-Driven Vocabulary Learning would motivate learners
- ✓ Whether Data-Driven Vocabulary Learning could be applied out of classroom
- ✓ Whether Data-Driven Vocabulary Learning would contribute to learners' discovery skills

The **hypothesis** of my study is:

Implementation of data driven vocabulary learning will improve students' English vocabulary level more than the traditional way of vocabulary teaching:

- ✓ It will increase their testing results in vocabulary
- ✓ The students will become more autonomous than before in mastering new vocabulary when/wherever needed
- ✓ The students will be more motivated to enrich their vocabulary

Methods of research in the dissertation are:

- ✓ review and analysis of existing literature on the topic
- ✓ interview
- ✓ experiment
- ✓ statistical analysis of obtained through experiment data

Quantitative paradigm:

I have used the Non-Equivalent Experimental Research design (Lynch, 2005) based on

- ✓ a pretest (one week before the study)
- ✓ immediate posttest (upon the immediate completion of the study)
- ✓ delayed posttest (two weeks after the study completed)
- ✓ statistical analysis of obtained through interview and experiment data

Qualitative paradigm:

Interview of randomly selected students:

✓ pre-interview (one week before the study)

✓ post-interview (upon the immediate completion of the study)

Novelty

The Data-Driven Vocabulary Learning was introduced by Tim Johns (1991) as a new language learning strategy by taking advantage of corpora. Since then it has been welcomed many researchers. The positive and negative criticism was put forward. Yet there have been so few empirical studies to show whether it is advantageous when compared to traditional way of vocabulary teaching. Furthermore, as far as I investigated, almost no empirical study was conducted in high schools. Therefore this study will be the first which will be implemented in high schools and Uganda.

Theoretical value

The theoretical bases of my research are:

✓ the ideas on vocabulary learning strategies and activities (e.g., Richards, 1976; Oxford, 2001; Schmitt, 2010; Allen, 1983; Folse, 2004, Nation, 1990)

✓ the ideas of student-centered teaching (e.g., Farrant,1980, Richards and Renandya, 2002)

✓ the ideas of using Computer-Assisted Language Learning (CALL) and its benefits together with hindrances (e.g., Levy, 1997, Beatty, 2003)

✓ the details of corpus studies and the path to electronic corpora (e.g., Keeffe, A., McCarthy, M., & Carter, K., 2007)

✓ the emergence of DDL and the implementation of concordancing in language learning (e.g., Johns, 1991; Sinclair, 1991; Meyer, 2002)

I have compared the vocabulary learning strategies in the first and second languages, ways of learning vocabulary, and the opportunities offered by contemporary technologies to make vocabulary learning more efficient. I have studied the advantages and the drawbacks of DDL applications to vocabulary teaching and learning. My research contributed to the development of DDL stages, steps of implementation and DDL activities.

Practical Value

The DDL activities offered as well as the step-by-step recommendations on how to teach students to use DDL constitute the main practical value of the research. The students, armed with these strategies, can deduce word meaning in and out the class, armed by mobile electronic

devices, whenever they need it, even if it is not available in the dictionary or if the dictionary gives too many meanings, which makes it difficult to choose the adequate to the context meaning.

Structure of dissertation

The dissertation involves the following parts: Introduction, 3 chapters, conclusion, and an appendix. There are 19 tables and 15 figures in it.

CHAPTER 1. THEORETICAL BACKGROUND

Initially, the steps and experiences of language acquisition in first language are overviewed. Language learning initially begins with listening in the environment. Babies first hear the expressions in their parents' or caretakers' speech, then stories in the storybooks (Hart & Risley, 1995). The knowledge or competence of learners' vocabulary in the native language (L1) becomes better month by month, year by year as their experience in life and knowledge of different contexts make them learn new vocabularies in different atmospheres.

In Chapter 1, the strategies of vocabulary learning are reviewed. Besides, a short historic overview of grammar translation method, translation method, memorization method in vocabulary teaching is explained.

In this chapter, the question "what affects vocabulary learning strategies" is raised and the possible solutions are highlighted. A variety of factors are discussed, such as learners':

- socioeconomic status of the family
- education level of the family
- type and the number of story books they read
- experience in life
- being in different contexts
- guessing–inferencing strategies
- exposure to language
- culture

If in the native language, most of vocabulary is acquired incidentally and intuitively, in the second and especially foreign language learning purposeful learning provides correct comprehension and sufficient repetitions for memorization, while incidental vocabulary learning

provides internal motivation (the need to understand the word for communication), so the two approaches have to be combined.

In order to overcome the hindrances, there have been many attempts by researchers to create second/foreign vocabulary learning strategies such as root approach, mnemonic approach, topical vocabulary checklist, lexical inferencing, glossing, etc.

The role of student-centered education is also discussed in this chapter. Besides, the effect of student-centered education in vocabulary teaching is highlighted.

Chapter 1 includes a theoretical background of computer-assisted language learning as well as types, areas, benefits and limitations of it. In computer-assisted language learning (CALL), computer is not the main method; it is just a tool for making learning process easier. Moreover, it is engaged language learning in which a learner uses a computer and, as a result, improves his or her language (Beatty, 2003).

There are various advantages of CALL in language learning, such as:

- it provides authentic opportunities to make learners' skills in writing, listening, reading and speaking better;
- learners can fulfil drills or they can investigate and study via projects or they can read or listen any type of content they are interested in;
- learners are more motivated since they can use visuals.

CALL has a vast area of interest in language learning such as simulations, games, authentic video, internet and mobile phones. Each of these areas has many benefits in language learning, as they facilitate learning. These areas also motivate learners, because students have fun while implementing them.

Although CALL has many advantages, it has some limitations such as:

- Psychological limitations: Some learners may not have a computer, tablet, smart phones etc. because of economic problems, while others have one of the devices. Therefore, they can psychologically be affected.
- Pedagogical limitations: Some teaching and learning items may not exist electronically and some materials may be limited for computers.
- Technical limitations: Some schools may not have computer laboratories. Even if there are computers or other technological devices, they are inclined to be broken down.

In chapter 1, the information about corpus and its usage in the past and nowadays is also presented. In addition, the theoretical background of concordancing and Data-Driven learning (DDL) approach is explained. To sum up:

Data-Driven Vocabulary Learning and concordancing are a new strategy to foster vocabulary learning, taking advantage of electronic corpora. By means of DDL learners read the sentences in corpora and try to infer the meaning of the word that they would like to learn. Moreover, they analyze the collocations and the actual usage of the word in authentic contexts through concordance lines. DDL also gives great autonomy to learners (Tribble and Jones, 1997, Keeffe, McCarthy & Carter, 2007).

However, some researchers (Flowerdew, 1996; Lamy & Klarskov Mortensen, 2007; Granath, 2009) criticize DDL because:

- The size of the corpus (the immediate context) is sometimes too little to be analyzed.
- The linguistic or intellectual level of students may not be appropriate to the corpora.
- There may be lots of variety of usage of unfamiliar vocabulary.
- Technical problems that students and teachers may encounter while using the corpora.

Most of the researchers imply that the drawbacks mentioned above can be overcome by means of carefully made orientations and a few hours of training. Sealey and Thompson (2007), for example, show how even primary school children can take advantage of corpora in their mother tongue, suggesting that, in the right conditions, no great level of sophistication is necessary. Moreover, Bernardini (2001) states that "the difficulties should not be overestimated; learners should quickly acquire the skills needed" (p. 243). Likewise, Breyer (2006) stress that on condition that there is enough training, DDL can be adopted easily.

In brief, DDL can be implemented by ordinary learners giving them autonomy to discover the language items and deduce the meaning of unfamiliar words making them linguistic researchers. Today's students are normally happy when technologies are used for learning. In addition, students have a portable teacher in and out of classroom where they can take advantage of it easily in minutes.

CHAPTER 2. TEACHING VOCABULARY EFFECTIVELY

This chapter reviews the vocabulary learning strategies and taxonomies in addition to studies performed in the field. To summarize:

Since education moved toward more student-centered language learning and the learners have been required to learn and find out word meanings and collocations independently, to understand how they learn and what affects their learning has become as crucial as what is learned.

DDL is a vocabulary learning strategy that is mentally adequate for high school children as they have reached formal operational stage of cognitive development. In DDL students study and discover the target words as if they are making a linguistic research with the help of online corpora. To apply DDL, teachers have to be informed about its advantages and taught the technology and some DDL activities. Later teachers can develop their own DDL activities, to make the students' experience really effective and enjoyable learning.

Students need to master DDL under teacher's guidance:

- The involved computer skills
- The word meaning elicitation strategies

Students will need to undergo the following stages:

- Stages which involve integration;
- Stages which involve memory skills;
- Stages which involve language use;
- Stages which involve exposure.

They will apply DDL first completely under teacher's supervision, as a whole-class activity, then with the help of more knowledgeable others (their peers who better acquired the new strategy), as pair or small group work, and eventually completely on their own, out of class.

DDL has the following advantages:

- Authentic language
- Application of technologies (which is normally motivating for students)
- May be practiced in class, at home and outdoors via smart phones, tablets and laptop computers, in many cases can play the teacher's role
- Provides learner autonomy and intellectual development (application of cognitive strategies)
- Can involve cooperation

Compared to the application of on-paper and electronic dictionaries, DDL

- can help with those items or meanings which are not offered by dictionaries
- provides student mental involvement and thus enhances memorization
- offers more information concerning collocation
- permits not only effective receptive applications, but also productive applications

When / if they master DDL, students will become more motivated and they can get qualified help from a limitless resource which never gets angry or tired thus, creates a student-friendly classroom atmosphere.

CHAPTER 3. RESEARCH DESIGN AND METHODOLOGY

The research held consisted of two parts: Non-equivalent experimental research and pore and post experimental interview.

The *goal of the experiment* was to find out whether DDL contributes learners` vocabulary competence more than traditional way of vocabulary learning or not.

The *goal of the interview* was to take the opinion of participants whether they liked the DDL approach in vocabulary learning or not.

The *method of research* used was quantitative and qualitative statistical analysis of obtained through interview and experiment data.

The experiment was conducted at one of the private dormitory boy high schools in Kampala, Uganda at the beginning of third semester in 2013-2014 academic years. The system of education in Uganda has a structure of 7 years of primary education, 6 years of secondary education divided into 4 years of lower secondary and 2 years of upper secondary school and 3 to 5 years of post-secondary education. The present system has existed since the early 1960s. Although the local folk use Ugandan tribe languages in daily life (belonging to the following families: Bantu, Swahili the most influential of them, Nilotic, Central Sudanic and Kuliak) English is widespread throughout the country and it is the education language in all schools (Parry, 2000). However, the status of English is between a second (education language) and foreign (there is little English-speaking environment outside school) language.

The target population for this study was grade 10 students, as they had no stress like other grades that were preparing for national promotional exams. After the approval of the school director was obtained, 84 grade 10 learners were randomly distributed into four classes, which were selected for the study and randomly assigned into two experimental instructional and traditional instructional classes.

Some of the learners failed to complete some lessons and post-tests so 12 students were removed from the analyses. Therefore in the end, for the analysis of the results, the final N size was 36 for Experimental group and 36 for Control Group.

32 words out of 50 were chosen according to preliminary testing that more than 60% of the students did not know (failed to fulfil corresponding items) in order to be taught. Eight words were taught in each session which was composed of two lessons totally lasting 80 minutes.

The duration of the experiment was three months and during this time, both EG and CG took a pre-test before the experiment for 50 words and immediate post-tests as soon as instruction of each batch of words was over. Besides, they were given delayed post-test to analyze retention rate of words two weeks after the experiment was done.

The tests held involved multiple choice gab filling; matching the words with their definitions, interpretation/synonym and words in context tasks, and the whole test was assessed out of 100 points.

In control - traditional instructional – classes (initially 42 students), traditional vocabulary teaching activities were prepared and presented to students so as to teach the target eight words. In each eighty minutes of instruction, a number of different traditional vocabulary teaching activities were implemented. Students had to learn eight words in each session which lasted 80 minutes and in total 32 words in four sessions.

The other half of the students which initially were 42 students of experimental classes, their number later decreased to 36. In experimental - Data-Driven Learning - classes, students were applying DDL activities for vocabulary study.

For each session, Data-Driven Vocabulary Learning activities were prepared and presented to students in order to teach the target eight words, in total 32 words in four sessions: When students were taken into computer laboratory with an internet connection, they were asked to open a web page and enter an URL ``British National Corpus`` (http://www.natcorp.ox.ac.uk/) .

- After the students opened the website, they were asked to write the target words one by one to the ``look up`` box.
- After that, they were asked to read first ten sentences in five minutes and try to deduce the meaning of each sentence.
- When students finished reading, they were encouraged to read ten more sentences giving their focus to the meaning of target word at this time and they tried to infer the meaning.

- Upon students` guess attempts, they were asked to compare their results and how they found out the meaning of the word with their classmates. While they were discussing the methods, teacher walked around and listened in.

- As soon as all the students were certain about the meaning of target word, they shared what they inferred with their teacher. Upon students` feedback, the exact meaning of the word was presented to students.

- Since the students learned how to use and implement the procedures above, at this time, they were asked to find out the meaning of second target word by using same methods taught them above on their own. They were given 10 minutes to find out the meaning of second target word using the same order.

- They were also asked to find out other two target words using the same methods and same order on their own.

- The other 4 words were given as homework to be learned using same methods taught above.

- After the students underwent the procedures above, they were introduced another web site "Corpus Concordance English" so as to analyze the sentence structure and collections with the target words and asked to enter the URL "http://www.lextutor.ca/conc/eng/".

- After the students opened the website, they were asked to write the target words one by one to the search box.

- When the target word was written to the search box, students were asked to choose a corpus from the box next to search box. The students chose a corpus or a number of corpuses from the list by the help of teacher.

- As soon as the students entered the target word, they encountered a number of sentences enumerated in a concordance style in which the target word was listed in perpendicular direction as in Figure 1 below.

- After the concordance lines appeared, consisting of minimum 2-3 words left and 2-3 words right from the target word as in Figure 3, students were asked to read the sentences and try to analyze the structure of it silently in 5 minutes. As soon as the allocated time was finished, they were told to compare their results with the student who was sitting near them. Teacher observed them during their discussions and listened in.

Figure 1. A sample of concordance lines in BNC-COCA for "parched"

```
y nailed him up Ah what pain His lips are PARCHED with thirst and they mock him still
eeds before the ground becomes completely PARCHED To this class belong many of our cu
 a most unpleasant manner Her tongue felt PARCHED for a cool drink She came upon him
What do you say Don Esteban moistened his PARCHED lips and with the back of his hand
 up boys Can you not see the gentleman is PARCHED Mayhew I have to get back They all
u like a drink B I d love some coffee I m PARCHED or B No thanks I ll have some coffe
on the phone And I m Tegan Walker and I m PARCHED Could I get a water Of course Um f
st around Bombay across immense tracts of PARCHED and sun scorched table land where
faster fell the rain How lovely cried the PARCHED flowers as they raised their droop
```

- When students ended up discussing, they were told to share their deductions loudly one by one with their friends. They were given corrective feedback when they shared something wrong.
- In another activity, to increase the awareness of how the target word was used in sentences, the collocations were repeated to students 2-3 times loudly like;
  - ✓ His lips are ***parched* with** thirst
  - ✓ Don Esteban moistened **his *parched* lips**
- After teacher intentionally read the collocations bold above, he wanted students to repeat them loudly first in group then one by one to absorb the actual usage of the word.
- Because the students were taught how to use and implement the methods above, they were asked to analyze the second target word by using same methods taught them above on their own. They were given 10 minutes to analyze the second target word using same order above.
- Upon this activity, students were asked to analyze other two target words using the same methods and same order on their own.
- The teacher asked the students to fulfil gap-filling and matching drills, write sentences by using the target words and read one of them aloud in class.
- Form (vocabulary)-focused speaking exercises were applied.
- The remaining 4 words were given as homework to be analyzed and written down the findings using same methods taught above.

With time, students became more independent in using DDL. If the first 4 weeks involved whole-class activities, later the students were working in pairs and small groups, while the teacher

was available for help whenever needed. While doing homework, students were also recommended to use DDL when they came across unfamiliar vocabulary.

Before the experiment, interview was held with six of the students, three from the experimental group and 3 from the control group in order to understand the motivational level and to add a qualitative dimension to the study. Those thus selected were asked if they consented to be interviewed, and all agreed.

After the experiment was over, in order to understand students' point of on DDL and corresponding vocabulary learning activities, a post-experimental interview was conducted. In addition to eight pre-experimental interview questions, five questions were also asked to the same participants who took part in pre-experimental interview.

This chapter presents the results of the analyses for the effects of various instructional types on the application of data driven vocabulary learning as measured by both production (experiment) tasks in the pre-test, post-test and delayed post-test and interpretation (interview) procedure.

The results revealed that the mean pretest scores in both groups are close to each other (M=23.44; M=24.83) for control group (CG) and experimental group (EG) respectively as in Table 1 and Figure 2 below. The standard deviations are also close to each other, but a bit too high (showing that the groups' level of vocabulary skills is not very homogeneous).

Table 1. Pretest, Immediate Posttest &Delayed Post-test Scores out of 100 for CG+EG

		PRETEST	IMMEDIATE POSTTEST	DELAYED POSTTEST
CG	Mean	23.44	55.90	45.75
	N	36	36	36
	Std. Deviation	11.14284	17.22646	21.3411
EG	Mean	24.83	65.19	58.77
	N	36	36	36
	Std. Deviation	13.3619	14.13726	17.4043
Total	N	72	72	72

Figure 2. Pretest, Immediate Posttest &Delayed Post-test Scores out of 100 for CG+EG
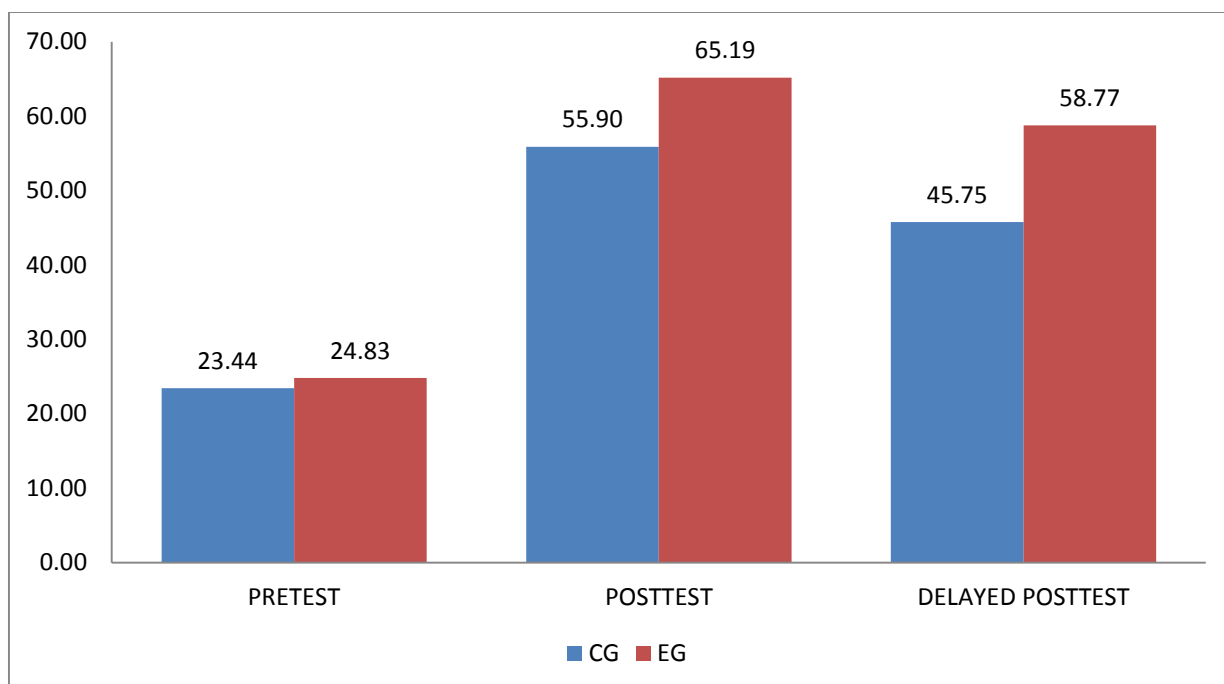
The control group students' score increased from 23.44 in pretest to 55.90 in immediate posttest, but decreased to 45.75 in delayed posttest. Thus the final increase was by 22.31 points.

On the other hand, the experimental group students' score increased from 24.83 in pretest to 65.19 in immediate posttest, but decreased to 58.77 in delayed posttest. Thus the final increase was by 33.94, which is substantially more, which reveals a higher efficiency of DDL approach to vocabulary instruction.

The decrease in the delayed post-test in both groups is explained by the natural knowledge decay with time process, however, the decrease between the immediate and the delayed post-test in the control group is rather substantial (by 10.15), while in the experimental group it is less (6.39), which shows that in the long run DDL approach also yields better results.

Therefore, it can be said that the experimental group learned and retained the target words better than the control group.

Table 2. Pretest, Immediate Posttest &Delayed Post-test Score effects for CG+EG (ANOVA)

		Sum of Squares	df	Mean Square	F	Sig.
PRE-TEST	Between Groups	34.722	1	34.722	.229	.633

	Within Groups	10594.618	70	151.352		
	Total	10629.340	71			
IMMEDIATE POST-TEST	Between Groups	1552.870	1	1552.870	6.254	.015
	Within Groups	17381.456	70	248.307		
	Total	18934.326	71			
DELAYED POSTTEST	Between Groups	3051.757	1	3051.757	8.048	.006
	Within Groups	26542.426	70	379.177		
	Total	29594.184	71			

Moreover, by means of ANOVA test, it is clearly seen in Table 3.11 that there is no significant difference between CG and EG in pretest, $F(1, 71) = 0.229$, $p = .633$, however EG did significantly better than CG, $F(1, 71) = 6.254$, $p = 0.015$, $F(1, 71) = 8.048$, $p = 0.006$ in immediate posttest and delayed posttest respectively. The quantitative results have revealed that both groups enhanced their performance on the word recognition test, but it was greater for the experimental group. And the difference was statistically significant. The obtained results support the hypothesis of the research that DDL is effective for vocabulary knowledge increase.

To be able to find a qualitative support, pre- and post-experimental interviews were also analyzed.

The pre-experimental interview questions showed that almost all of the students learn the meaning of the word by means of internet and online dictionaries. In terms of dictionary use, most of the students responded that it is difficult to look up the meaning of unfamiliar word as it takes time. Besides, it is hard to find the target word as some dictionaries have a limited capacity. On the other hand, another question revealed that they mostly prefer inferring the meaning from context, however, if they cannot find the answer, they look it up from internet.

The pre-experimental interview questions also showed that the students were ready to learn and apply DDL in and out of classroom, as they like learning on their own and they use computers so much and feel happy when technology is integrated in their learning process. Moreover, they want to use their own potential and learn on their own rather than teacher pressure on them.

Upon experiment, the same students from CG and EG were asked another set of questions regarding the instruction they got together with the questions asked in pre-experimental interview. The control group students gave almost same responses as in the pre-interview, but in the experimental group the students began to change their attitudes towards vocabulary learning methods.

The experimental group students were directed five questions. The first one was about how they found DDL throughout the instruction. The responses were all positive. They expressed an opinion that DDL was comfortable and relaxed and they had fun while applying DDL, as it involved technology.

The interview responses also showed that concordance to search for the words' meaning and collocation and learn inductively and autonomously was favored and preferred by the participants. So the hypotheses that students become more autonomous and motivated while using DDL was also supported by the qualitative results.

CONCLUSION

1. Vocabulary plays a key role in learning a new language. However, teaching vocabulary to second/foreign (L2) students is one of the main difficulties of teachers. To overcome this problem, more contemporary and efficient methods of teaching and learning strategies should be investigated and, if successful, applied.

2. In the mother tongue, babies acquire vocabulary by hearing and the motivation for learning vocabulary is as natural as breathing, as this is the way which leads to communication with the adults on whom the child depends completely. In learning a second and especially foreign language there is no such natural motivation and the teacher's task is to stimulate students' motivation. The traditional methods of vocabulary teaching are efficient to a certain degree, but they are rather teacher-centered, which is eventually not very good.

3. Vocabulary learning strategies refer to the techniques which help learners to build up their FL / SL vocabulary stock. Compared to the older language teaching methods (Grammar-Translation, Direct, Audio-Lingual) and psychological theories (Behaviorism) that applied rote memorization via numerous repetitions, contemporary methods (Communicative Learning) and psychological (Cognitive) theories emphasize higher-order cognitive strategies and learner autonomy: word-building, morphological and syntactic, as well as contextual analysis, combined with the application of background knowledge, help

language learners memorize and retrieve whenever needed the words and their semantics, also their collocation.

4. As a result of fast development in technology, computers and other high tech devices have become an indispensable part of our daily lives in the last few decades. The students of today learn differently than the previous generation did. They are not satisfied when computers and mobile technologies, especially their interactive applications are not involved in the learning process.

5. Corpus linguistics works with the collection of written or spoken texts. It permits to create new dictionaries and to study certain authors' style, as well as to study the general peculiarities of various functional styles. Corpus linguistics began to develop much faster when computers were involved in linguistic data processing. Information about the target word usage from thousands of authentic written and spoken texts can be collected now. What took years before, today, with the application of corresponding software, takes minutes. Recently, corpus linguistics has found educational applications as well. Without having linguistic research skills, students can undergo the exciting experience of being language researchers and use various corpora to guess word meaning or to find out the collocation ability of the unfamiliar word.

6. Whatever the quality of the dictionary, it cannot contain all words in the language, as vocabulary stock today develops fast, trying to reach up with the fast-developing life. Students do not always have their teacher by their side to provide help, and from time to time the dictionary cannot help them. The Data-Driven Learning approach to dealing with vocabulary permits language learners to use the corpora available for free on the internet. Reading whole sentences or their fragments (at least 2-3 words to the left and right), students, using inferencing strategies, can guess the word meaning and study the collocations.

7. DDL supports:
- Autonomy and curiosity
- incidental learning of vocabulary (the way we do in L1)
- memorization of vocabulary (via numerous repetitions)
- inductive learning (from example to meaning)
- higher order thinking (vocabulary learning and meaning elicitation strategies)
- eliciting word meaning and dealing with its variance with context
- dealing with collocation
- self-confidence and motivation of learning

8. Due to mobile electronic devices, after the technology of DDL application and the strategies of meaning elicitation are acquired, DDL can be used both in class and out of it, and the mobile electronic devices become the vocabulary learning support which is available everywhere where internet can reach

9. The steps of learning to use DDL are:

    - Training
    - Execution
    - Deduction
    - Cooperation
    - Assessment

10. The DDL activities to be used as both class and home work are:

    - While reading a text, use DDL to find out the meaning of the unfamiliar words you come across
    - Match the synonyms from the two columns. As all /some words given are unfamiliar, DDL will be used to find out the meanings.
    - Find out what the typical structures / collocations are in which the given words are used. Apply DDL for help.\
    - Find out the similarities and differences of the synonyms (they may concern both the meaning shades and the collocation ability)
    - Competition in groups on all the above.

11. It was hypothesized that the implementation of DDL in vocabulary learning would improve students' English vocabulary skills' level more than in the traditional way of vocabulary teaching. The skills were measured by immediate and delayed posttests. The quantitative results showed that both instructional groups (CG+EG) improved their mean scores on immediate and delayed posttests compared to the pretest, but the DDL group performed significantly better than the traditional group, which meant that EG group supported the first hypothesis. These results also supported some previous studies (e.g., Allan, 2006; Cobb, 1999; Horst and Cobb, 2001; Koosha and Jafarpour, 2006; Sun and Wang, 2003).

12. The second and third hypothesis were that students would become more autonomous than before in mastering new vocabulary wherever needed and they would be more motivated to enrich their vocabulary. In fact, the qualitative (interview) results revealed that both groups expressed readiness to use DDL. In the post-experimental interview the experimental (DDL) group the respondents confirmed their satisfaction with the DDL

application and their motivation to continue using this strategy of vocabulary learning. They responded that DDL:

- involves technology
- makes learners autonomous
- stimulates learners to use their potential by discovery-based skills
- provides a stress-free atmosphere as there is no teacher pressure
- provides authentic examples via internet

Since DDL was aimed to make students autonomous learners who could use their potential and improve their discovery skills by guessing and inferencing strategies by means computers (e.g. Partridge, 2006; Tribble and Jones, 1997; Donesch-Jezo, 2013), the qualitative (interview) results in this dissertation also supported this view by the responses of students.

13. DDL can be applied by ordinary learners, making them autonomous and armed to discover the language items and infer the meaning of unfamiliar words, hence making them linguistic researchers. Nowadays, students are happy most of the time when technologies are used for learning. In addition, students are lucky to have a portable teacher in and out of classroom where they can make use of it easily in minutes.

List of publications related to the doctoral dissertation:

1. Data-Driven Vocabulary Learning Activities. Fifth International Research Conference on Education, English Language Teaching, English Language and Literatures in English. Tbilisi, IBSU, May 1-2, 2015, p. 411-417
2. Data-Driven Learning as a portable teacher. Fifth International Research Conference on Education, English Language Teaching, English Language and Literatures in English. Tbilisi, IBSU, May 1-2, 2015 p. 418-422
3. Data-Driven Vocabulary Learning vs Traditional Instruction at a high school in Uganda. *IBSU Journal of Education*, 2015, vol. 4, iss. 1, p. 79-85