



The Comparison of the Use of Data-driven Learning in Flipped, Blended and Conventional Classes on Students' Grammar Learning

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Abstract

Today, the use of technology in teaching foreign language has become a matter of considerable interest to language teachers in all over the world. The current study tried to investigate the suitability of data-driven learning in flipped and blended classes vs the conventional ones on students' grammar learning. To run this study, 48 homogenized students were selected and divided into three groups, including two experimental and one control group, 16 in each. Before the treatment, a grammar pre-test was administered. The two experimental groups received 12 sessions of data-driven instruction in the flipped and blended classes but the control group received grammar instruction based on the textbook. At the end, statistical analysis showed that the participants in both flipped and blended groups had better performance in the post-test. It also was concluded that the usage of data-driven learning had significant impact on both experimental groups. The results of this study can be beneficial for teachers, learners, syllabus designers, managers in learning environments, and policy makers to use data driven learning.

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Introduction

In this digital world, technology has been widely used as a resource for instruction of foreign language as educators increasingly recognize its ability to produce both independent and collaborative learning environments (Kern, 2006). In the same vein, computer technology used in Corpus Linguistics, i.e. the study of language as expressed in corpus (a collection of language texts organized and stored on a computer), has revolutionized the fields of linguistic research and applied linguistics (Boulton & Cobb, 2017).

Over the last two decades, linguistic corpus has shown tremendous potential in the computer assisted language learning and teaching (Cobb, 2010). These affordances have made some practitioners adopt the data-driven learning (DDL) approach, first proposed by Johns (1991), to provide inductive, discovery-oriented learning opportunities for learners whereby second language learners analyze corpus acting like a researcher as they are engaged in an active and autonomous process of learning (Chambers, 2010). DDL method uses corpus, as a tool in the hand of teachers or students to aid language teaching and learning (Lee & Lee, 2020). DDL can help students increase their ability to process language input efficiently by providing them with corpus data through concordancing programs (Granger & Tribble, 2014). The authentic language of DDL is one of the greatest benefits that is cited in its favor (Clifton & Phillips, 2006; Romer, 2008). In this way, DDL allows teachers and students to study naturally occurring language for grammatical patterns, word usage, semantic and pragmatic features, and textual discourse (Flowerdew, 2009). Another possible benefit of DDL is that it allows for more potential learner autonomy in the classroom, with less reliance on the teacher (Talai & Fotovatnia, 2012). With greater autonomy, students can also use DDL techniques to answer their own questions about language, as well as to become more independent language learners (Hunston, 2002).

As teachers now turn to the DDL approach and use corpora for pedagogical purposes (Mizumoto & Chujo, 2015), the possibility of using corpora in different kinds of technology-based approaches; such as flipped and blended learning motivated the researcher to explore the viability of extending the concept of DDL approach in flipped and blended classrooms to EFL contexts with reference to exploring the impacts on students' grammar learning.

Blended learning is defined simply as a learning environment that combines technology with face-to-face learning (Rasheed et al., 2020). In other words, blended learning means using a variety of delivery methods to best meet the course objectives by combining face-to-face teaching in a traditional classroom including teaching online (Asarta & Schmidt, 2020). According to Bersin (2003), "blended learning is the combination of different training "media" (technologies, activities, and types of events) to create an optimum training program for a specific audience" (p. 13). A sort of blended approach is flipped classroom learning where learning and teaching processes are reversed (Van Alten et al., 2020). In this kind of classroom, the materials related to the next session's lesson content will be given to students to observe at home in a videotape. The core premise of the flipped classroom is to remove the typical lecture portion from the class, replaced by exposing students to new active learning material so that the classroom becomes the place to practice activities and exercises (Tecedor & Perez, 2019).

Due to the pivotal role that DDL approach play in second language acquisition (Gilquin & Granger, 2010), utilization of corpus studies has drawn the attention of considerable number of researchers (Soruç & Tekin, 2017). Even though there are many studies about DDL approach, there has not been a parallel uptake of DDL on EFL learners' grammar in flipped, blended and conventional classes in formal language learning settings. As such, this research was designed on comparison of the suitability of the DDL in flipped and blended vs traditional grammar classes, so far lacking in literature. To fill the gap, the following research question was proposed:

- 1) What, if any, is the effect of data driven learning on EFL learners' learning grammar in flipped and blended classes versus the conventional one?

Literature Review

Related Studies in Flipped Learning

The literature indicates that the implementation of flipped learning in EFL classes is a promising instructional method (Arslan, 2020) which promotes students' English learning (Lee & Wallace, 2018) and their positive emotions in education (Jdaitawi, 2020). As some researchers pointed out, teaching through flipped classes fosters students' critical reading (Fatemeh et al., 2020), improves their writing achievement (Sukerti et al., 2020; Wu et al., 2020), enhances their vocabulary retention (Kirmizi & Kömeç, 2019; Rezaei Fard et al., 2021), develops their speaking ability (Abdullah et al., 2019; Amiryousefi, 2019; Chen & Hwang, 2020; Wang & Wright, 2018), and their listening comprehension (Ahmad, 2016; Namaziandost et al., 2020). Inverting the traditional way of instruction and allocating more class time to peer-to-peer discussions and interactive tasks improves students' learning achievements, increases their engagement (Shahnama et al., 2021), and their motivation in the learning process (Zheng et al., 2020). Pudín (2017), Al-Harbi and Alshumaimeri (2016) compared flipped classes to traditional-learning ones in terms of teaching grammar and confirmed that sending materials or contents based on students' textbook to them before their class time lets them learn at their own pace, enhances their involvement in class activities and improves their grammar learning achievement.

Related Studies in Blended Learning

Several studies have been carried out to find out the role of blended learning in the process of language learning. For example, Alipour (2020); Jia et al. (2012); Masita (2020); Pazio (2010), investigated the positive benefits from applying blended learning on developing vocabulary learning and showed that incorporating blended learning into language instructional-learning contexts benefits learners in terms of expanding their vocabulary knowledge. Merging conventional classes with online ones has also been examined in EFL writing classes (Alrouji, 2020; Hosseinpour et al., 2019; Sujannah et al., 2020), and their results confirmed that blended learning could develop learners' writing competence and increase their motivation as online classes which are used in blended learning settings support learners' collaboration, and interaction.

Incorporating online lessons into existing conventional classes enhances the quality of teaching and learning and enlarges learners' motivation and attitudes towards learning (Bañados, 2006; Wang et al., 2021; Wright, 2017). Moreover, engaging learners in blended

classes enhances their English communication skills (Kobayashi & Little, 2011). Yang, (2012) compared college students' reading with blended learning with their peers reading with on-site instruction and concluded that blended learning can improve students' reading proficiency because the online reading activities facilitate their social interaction and promote their engagement with the text and enable them to practice more than their peers who read just online. Likewise, a study done by Bataineh and Mayyas, (2017) explored the effects of blended learning on EFL students' reading comprehension compared with their peers reading by conventional methods. Their findings revealed that using Moodle supplemented in-class reading instruction can increase their higher level of reading comprehension. Moreover, the blended learning provides students with more opportunities to practice their speaking (Ibrahim & Yusoff, 2012). The modality of the blended learning also reduces students' anxiety and help them produce more oral output at their own pace (Ehsanifard et al., 2020)._ According to Klímová and Toman (2020), students who learn grammar through the blended learning approach using face-to-face teaching and mobile learning, outperform those who learn through traditional methods. The use of blended learning in EFL classes can maximize the quality of students' grammar learning (Grgurovic, 2011).

In few studies, blended and flipped classes were compared to conventional ones. For instance, Khodabandeh and Tahririan (2020) investigated the effect of flipped and blended classes on students' grammar learning and revealed that both blended and flipped classrooms develop EFL learners' grammar knowledge and also enrich their learning motivation, and teamwork skills. Both flipped and blended learning influence positively students' perceptions and satisfaction of EFL classes (Fisher et al., 2018).

Blended and flipped learning are underpinned by theoretical foundations of social-cognitive theory (SCT), Piaget (1971) and Vygotsky (1978), According to these viewpoints, learners learn not only through their own experiences, but also by their interactions with others (Wang & Wu, 2008).

3.1. Method

3.2. Design of the Study

In the present study, an experimental research design was adopted. The independent variable was DDL method and the dependent variable was the participants' grammar learning.

3.3. Participants

This research was performed in Safir English institution in Esfahan. The participants of the research were non-randomly selected among 140 female learners in the mentioned institution. Oxford Placement test was submitted to students and among the homogenized learners only 48 students were selected. The mean age of the learners was 17 years old. Theses 48 students were divided into three groups. Each group had 16 participants.

3.4. Instruments

3.4.1. Oxford Placement Test. Oxford placement test (OPT) was utilized as the placement test. This test places the students into the appropriate level class for a language course.

3.4.2. Pre-test. The researcher used English Grammar Test Package which was downloaded from med.fums.ac.ir. The current package had hundreds of grammar questions in the form of

multiple questions which were divided into three levels of elementary, intermediate, and advanced. The researcher extracted 40 questions from the package and were given to all the participants as pre-test. Each question had 0.5 point and the total points was 20.

3.4.3. Post-test. The current study used post-test to measure the grammar ability of the learners after performing the treatment. This test was provided by the researcher and was extracted from English Grammar Test Package that was described in the previous part. There were 40 multiple questions with 20 points.

3.4.4. WhatsApp Application. The online classes of both the flipped and the blended groups were held in WhatsApp. This application can be downloaded easily from Google play and Bazar applications.

3.4.5. Grammar Data. Grammar lessons were sent to the participants in the form of PDF files. Full expressions of English grammatical tenses produced by English native speakers were provided and were sent to the experimental groups. They had to read corpora and recognize designated tenses (Present, Past and Perfect Tenses) among a lot of examples which were given to them.

3.5. Procedure

140 volunteers took part in the homogeneity test and among the intermediate level learners, only 48 of them were chosen. The selected participants were divided into three groups of 16 learners. The current study was conducted during 2 months. Sessions were carried out once a week with the total number of 12 sessions except those three sessions which were allocated for performing placement test, pre-test, and post-test.

Regarding the blended group, the participants received their grammar instruction both in WhatsApp and their face-to face class. Every week, the teacher sent one pdf file of grammar corpus in the online group. The participants were required to read the file carefully and underline the designated tense and share their exercises with each other. During the face-to-face class also, the teacher first repeated the explanation of tenses and the participants worked on the exercises.

The participants of the flipped group received their pdf file of grammar corpus in their WhatsApp group two days before their online class and were asked to read and underline designated tenses and share their exercises with each other in the WhatsApp group. In both experimental classes, the teacher attempted to use some examples about grammar parts and the participants were supposed to guess the relationship between the examples. It encouraged them to identify the structure and then the rules for making it. The role of teacher was as time-monitoring and conducting the class activities rather than teaching deductively and lots of questions were asked during the class sessions to contribute the participants in grammar activities. It should be mentioned that the content of grammatical tenses was suitable for the intermediate level. In addition, the teacher did not teach the lessons, she only gave some examples as texts to the participants and asked them to discover the grammar points. At the end, the post-test was assigned to the participants.

The participants in the control group received grammar instruction through their designated textbook in the face-to-face class. The researcher who was also the teacher of all three groups,

started teaching grammar with first explaining the rules. After explanation and examples, the participants were supposed to do the exercises of the book. After the treatment sessions, the grammar post-test was assigned to them.

4.2. Results

In the following table the descriptive statistics of the pre-test and post-test related to the control, flipped, and blended classes are described.

Table 4.1. Descriptive Statistics

Variable	Stage	Statistical index		
		Group	Mean	Std. Deviation
Grammar Learning	Pre-test	Control Group	13.90	2.52
		Flipped Group	13.42	2.69
		Blended Group	13.90	2.76
	Post-test	Control Group	15.75	2.22
		Flipped Group	17.40	1.90
		Blended Group	17.90	1.97

Looking at the information of the Table 1, it can be obtained that there are significance differences between the performance of the all participants in the flipped and blended classes regarding grammar learning variable in the pre- and post-tests. The three groups had roughly the same means on the grammar pretest.

4.3. Inferential Results

4.3.1. Assumption One (Normality). Kolmogorov-Smirnov Test to measure the normality of data was used and the results of this test is represented in the following table. All the data obtained from pre-test and post-test of the control, flipped, and blended groups are normally distributed.

Table 4.2. One-Sample Kolmogorov-Smirnov Test

distribution of Scores	Stage	Groups	Kolmogorov-Smirnov		Result
			Sig	Z	
Grammar Learning	Pre-test	Control Group	0.38	0.99	Normal
		Flipped Group	0.45	0.98	Normal
		Blended Group	0.60	0.85	Normal
	Post-test	Control Group	0.60	0.86	Normal
		Flipped Group	0.89	0.40	Normal
		Blended Group	0.92	0.36	Normal

As it is observed in Table 2, the assumption of normality of distribution of scores in all groups for grammar learning was proved ($p > 0.05$).

4.3.2. Assumption Two (Equality of Error Variances). To consider the assumption of equality of error variance, Levene test was used. It is a rule that if the statistical result of the current test is not meaningful ($\text{sig} > 0.05$), the assumption of equality of error variance is proved.

Table 4.3. Levene's Test of Equality of Error Variances

Variable	F	df1	df2	Sig
Grammar Learning	2.12	2	57	0.12

Based on the Table 3 and the amount of F which was obtained by Levene test, there was no significance difference $\alpha = 0.05$ between the variance of the flipped and blended classes. So, the equality of error variance was 0 which means that the assumption of equality of error variance is acceptable.

4.3.3. Results of Analysis of Covariance. According to the results obtained from the Table 1, and considering the amount of F in the Table 4, it can be said that there was a significance difference between post scores of grammar learning of the three groups.

Table 4.4. Results of analysis of covariance

source	Dependent variable	Sum of squares	df	Mean square	F	sig	Partial Eta squared
Groups	Grammar	56.08	2	28.04	17.78	0.001	0.38

)Post-test(

According to Table 4, the performance of the flipped and blended classes was better than the control group in the post-test and there was significance different between the control group and the other groups in the post-test. So, it can be concluded that DDL learning had significant impact on the experimental groups.

4.4. Independent Samples Test

The following table compared the performance of the participants in the flipped and blended classes.

Table 4.5. Independent Samples Test

Grammar Learning	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	0.04	0.842	-0.815	38	0.420	-0.613	0.613	-1.742	0.742
Equal variances not assumed			-0.815	37.944	0.420	0.500	0.613	-1.742	0.742

Based on the Table 5, it can be understood there was no significance difference between the performance of the flipped and blended participants in the post-test. The reason is that, sig is more than 0.05 and H0 cannot be ignored (sig=0.420).

Discussion

The current study investigated the suitability of DDL in the flipped, blended, and traditional classes in the process of grammar learning. The results showed that the performance of the

flipped and blended classes was better than the traditional group. The results are in line with the previous studies who showed that the implementation of flipped and blended learning in EFL classes is a promising instructional method (e.g., Abdullah et al., 2019; Ahmad, 2016; Al-Harbi & Alshumaimeri, 2016; Alipour, 2020; Amiryousefi, 2019; Arslan, 2020; Chen & Hwang, 2020; Fatemeh et al., 2020; Jia et al., 2012; Jdaitawi, 2020; Kirmizi & Kömeç, 2019; Lee & Wallace, 2018; Masita, 2020; Namaziandost et al., 2020; Pazio, 2010; Rezaei Fard et al., 2021; Sukerti et al., 2020; Wang & Wright, 2018; Wu et al., 2020). According to the results of the current research, teaching grammar through DDL in both flipped and blended classes promoted the participants' grammar learning. According to the results, sending DDL to the experimental participants before their class time let them learn at their own pace, enhanced their involvement in class activities and improved their grammar learning achievement. In addition, the results showed that the performance of flipped and blended groups was approximately the same. Both flipped and blended groups facilitated the participants' social interaction and promoted their engagement with the pdf files and enabled them to practice more than their peers who just attended the face-to-face class and were taught grammar tenses through their text-book.

The results show that the DDL approach provided discovery-oriented learning opportunities for the participants of both experimental groups as they analyzed the corpus and were engaged in an active and autonomous process of learning. The results are in line with the previous studies who support teaching second language through corpus data (e.g., Chambers, 2010; Clifton & Phillips, 2006; Flowerdew, 2009; Lee & Lee, 2020; Granger & Tribble, 2014; Romer, 2008).). In addition, the use of grammar corpus in both experimental groups increased the participants' autonomy in the classroom (Talai & Fotovatnia, 2012) which helped them use DDL techniques to answer their own questions about grammar and become more independent language learners (Hunston, 2002).

Conclusion

The present study explored the suitability of the data-driven learning in flipped and blended classes vs the conventional ones in the process of grammar learning. The results were in line with the previous studies and it was concluded that teaching grammar through DDL in both blended and flipped classes had significant positive impact on the participants' grammar learning.

The suitability of DDL in the form of guided discovery approach in both flipped and blended classes were proved. So, the results can be helpful for teachers to implement the data-driven learning tasks in both flipped and online classes. Another group that can use the advantages of the data-driven learning approach is students who can use grammar corpus in their learning process.

The current research tried to work on data-driven learning in traditional, flipped, and blended class. So, the impact of DDL can be measured in other types of classes. Another point that must be considered is that the current research worked on the grammar ability of the learners where as some other skills such as listening, reading, and writing were neglected in this research. In addition, advantages and disadvantages of the DDL approach can be

investigated. Finally, the suitability of DDL in classes with different gender and age can be measured.



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