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Research Paper

The Impact of Flipped Classroom on Learning Outcome in a General English Course: Grammar and Vocabulary Gains in Focus

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Abstract

Flipped classroom establishes a framework for personalized education tailored to students' individual needs by incorporating simple technologies of audio/video recordings into instruction. Considering the challenges General English (GE) students and instructors face such as time limitation, students' low motivation and diverse learning preferences, there seems to be an urgent need for studies on flipped learning. The aim of the present study was to investigate the effect of flipped classrooms on Iranian EFL learners' learning outcome in a GE course. As such, fifty students of engineering majors in two intact classes participated in the study and were assigned to a control (n=25) and an experimental (n=25) group. The experimental group received instruction in line with the principles of flipped learning while the control group was taught using the conventional method. The participants' level of learning outcome was measured before and after the treatment by an achievement test consisting of two parts: grammar and vocabulary. The data were analyzed by Multivariate Analysis of Variance (MANOVA). The results revealed a significant difference between the two groups' performance on the achievement post-test in general and in its two sections (grammar and vocabulary) in favor of the experimental group. Further analysis showed that the effect size for the intervention was large ($\eta_p^2=.19>.14$) for general learning outcome; however, as for the components of the achievement test, the effect size was found to be large for vocabulary section ($\eta_p^2=.16>.14$) and middle for the grammar section ($\eta_p^2=.134<.14$), respectively. Possible interpretations of the findings are discussed and certain implications and applications for GE instructors and materials developers are suggested.

Keywords: *Flipped classrooms; flipped learning; learning outcome*

تأثیر کلاس معکوس بر یادگیری در درس زبان عمومی: تمرکز بر یادگیری دستور زبان و واژگان

کلاس معکوس چارچوبی برای آموزش شخصی‌سازی شده متناسب با نیازهای فردی دانش‌آموزان با استفاده از فناوری‌های ساده ضبط صدا / فیلم ارائه می‌دهد. با توجه به چالش‌هایی که دانشجویان و مدرسان کلاس‌های زبان انگلیسی عمومی از قبیل محدودیت زمانی، انگیزه کم و تنوع در ترجیحات یادگیری زبان‌آموزان با آن روبرو هستند، نیاز به مطالعات مربوط به یادگیری معکوس در این دوره‌ها ضروری به نظر می‌رسد. هدف از مطالعه حاضر، بررسی تأثیر کلاس معکوس بر یادگیری زبان‌آموزان ایرانی در دوره زبان عمومی بود. در این راستا، پنجاه دانشجوی رشته مهندسی در این تحقیق شرکت کردند و به یک گروه کنترل (25 نفر) و یک گروه آزمایش (25 نفر) تقسیم شدند. آموزش در گروه کنترل از طریق روش مرسوم و در گروه آزمایش متناسب با اصول یادگیری معکوس صورت گرفت. شرکت‌کنندگان قبل و بعد از آزمایش در آزمون پیشرفت تحصیلی که شامل دو بخش دستور زبان و واژگان بود، شرکت کردند. داده‌ها با استفاده از روش تحلیل واریانس چندمتغیره مورد تجزیه و تحلیل قرار گرفت. نتایج نشان داد که تفاوت معنی‌داری بین عملکرد دو گروه در پس‌آزمون پیشرفت تحصیلی به‌طور کلی و در هر دو بخش آن (دستور زبان و واژگان) به نفع گروه آزمایش وجود دارد. نتایج تحلیل‌های بیشتر نشان داد که میزان تأثیر مداخله در یادگیری به‌طور کلی زیاد بود ($\eta_p^2=.19>.14$). با در نظر گرفتن بخش‌های آزمون مشخص شد میزان تأثیر برای بخش واژگان ($\eta_p^2=.16>.14$) زیاد و برای بخش دستور زبان ($\eta_p^2=.134<.14$) متوسط بوده است. یافته‌های پژوهش و کاربردهای آن برای مدرسان زبان عمومی و طراحان مواد آموزشی تبیین شده و پیشنهادهای مرتبط ارائه شده است.

واژگان کلیدی: کلاس معکوس؛ یادگیری معکوس؛ پیشرفت تحصیلی

Introduction

The use of technology across the globe and the ubiquitous access to different types of technological tools and affordances among people of the 21st century have transformed the meanings of school, learning, teaching, teacher, and learner. This transformation has affected almost all fields of study and school subjects, and English is not an exception. Nowadays, many English as a Foreign Language (EFL) teachers incorporate different forms of technology into instruction to increase their teaching effectiveness and assist students' learning by promoting their learning motivation and helping them become more self-directed and autonomous language learners.

Flipped classroom as one of the most ambitious attempts to meet the needs of learners and promote learner-centered learning via using very simple technologies in education was introduced to the arena of education in 2000 by Lage and his associates (Lage, Platt, and Tregila, 2000). Flipping the classroom simply means what normally happens in the classroom is done at home and everything that students do as homework is completed in the classroom (Lage et al., 2000; Bergmann, and Sams, 2012). To achieve this goal in a flipped class, the teacher provides the students with his/her pre-prepared audio or video taped lectures. Students should listen to the lecture or watch it before the class and learn the taught materials. Classroom time is allocated to examining students' problems through group activities and questions and answer techniques (Bergmann, and Sams, 2012).

The flipped class affects teachers' instructional practices and the way they interact with students or communicate with parents. The main difference between flipped and traditional classroom is that the teacher abandons his role as a speaker and controller of the teaching process and becomes a guide and facilitator of the learning process (Noroozi, Rezvani, and Ameri-Golestan, 2021). The flipped class gives students control over the teaching process by pausing and rewinding audio/video files. In this way, students with different levels of proficiency can listen to or watch the instruction over and over again, hence taking the main responsibility for their learning. Saving class time, making the teacher more aware of the students and their strengths and weaknesses, developing a sense of responsibility and academic self-regulation in students and creating an active learning environment are also among advantages of the flipped class (Mehring, 2018).

While flipped instruction is a valuable teaching strategy for language classes, language teachers do not show much interest in applying it in teaching language skills and as a matter of fact flipped instruction is not very popular in ELT (Mehring, 2018). Reasons vary from limited familiarity with this type of instruction to administrative and academic constraints teachers face at the educational centers. Literature shows that most studies done on flipped classroom in higher education are on science and math subjects and a few studies have probed into the application of flipped classroom in general English courses of colleges or universities. To fill this gap, the current study investigates the impact of flipped teaching on General English (GE) students' learning outcomes in comparison to a conventional GE course.

Review of literature

Although the flipped class is suggested to have entered the field of education in the first decade of the 21st century, the underlying assumptions of flipped classroom are attributed to learner-centered education of the 70s and even to the philosophical schools of the ancient time (Bates, Almekdash, and Gilchrest-Dunnam, 2017). One of the oldest learner-centered approaches is the Socratic dialogue (questions) that forms the basis of critical thinking. In this model, the learner's role in instruction is to discover the truth and knowledge through debate and questioning.

In the twentieth century, John Dewey emphasized social education and the learner-centered approach as the first priority of the educational system by focusing on learners' motivation and desire for learning through experiencing. According to his pragmatism, learning occurs by challenging the learners' mind through solving real problems. In this process, the responsibility of discovering and learning concepts is given to the learner. In addition to these philosophical schools, cognitivism and constructivism can be related to the idea of flipping the instruction. In the flipped classroom, learning occurs at both individual and group levels. At the individual level that is related to the cognitive aspects, three principles are emphasized: a strong knowledge base, learning new concepts through scaffolding, and organizing new concepts by schemata activation (Bates, Almekdash, and Gilchrest-Dunnam, 2017). At the group level, social education is underscored by group work and collaboration, intrapersonal relations, problem-solving and active learning, and placing students in the Zone of Proximal Development (ZDP) (Khadri Ahmed, 2016).

In a flipped classroom, Bloom's taxonomy is reversed in a way that the cognitive activities of the lower levels (i.e., remembering and understanding) are done before class and thus learners have plenty of time to deepen the learning of basic concepts before entering the classroom. After that, higher level cognitive activities (application, analysis, evaluation, and creation) are done under the teacher's guidance and support in the classroom (Andrade & Coutinho, 2016).

Despite the emergence of the idea of flipping the class in 2000, studies on the effectiveness of this approach in educational settings boomed in the second decade of the 21st century. A review of research related to the use of the flipped class in education in 2016 showed that 80% of research in this field was conducted in 2015 and 2016. This can be related to the increase in access to various technologies, especially the Internet in recent years (Akçayır, and Akçayır, 2018). In a pioneering study, Lage (2000) first used the inverted class (as they called it) at the University of Miami to teach the principles of microeconomics and introduced this educational approach to education. In the following years, a significant number of studies examined the impact of flipped classrooms in higher education courses such as pharmacology (See, and Conry, 2014), chemistry (He, Holton, Farkas, and Warschauer, 2016), zoology (Thai, Wever, and Valcke, 2017), calculus (Yilmaz, 2017), and biology (Awidi, and Paynter, 2019).

Some studies have reviewed the literature of flipped classroom in certain time periods with a focus on specific themes. O'Flaherty and Phillips (2015), by reviewing the research done till 2014, found that in spite of the fact that flipped instruction is time-, money- and energy-consuming university professors and students generally have positive perceptions of the value of this educational approach. In another review study, Akçayır and Akçayır (2018) examined the advantages and disadvantages of flipped instruction by reviewing studies done till 2016. Their findings revealed that the most frequently reported advantage of the flipped classroom is the improvement of student learning performance followed by pedagogical contribution, time efficiency, and positive dispositions. Furthermore, a number of challenges related to out-of-class activities, such as inadequate student preparation prior to class and teachers' perspective, and technical and technological problems have been found. In a recent study, Strelan, Osborn, and Palmer (2020) performed a comprehensive meta-analysis of the effects of flipped classroom on student performance, relative to traditional teaching models, across disciplines and education level. The results showed that overall, the flipped classroom had a moderate positive effect on students' performance regardless of their disciplines. Testing of other moderators relating to group sizes, in-class activities, pre-class testing, and the sophistication of a flipped classroom design provide evidence to suggest that the primary contributing factor to the flipped classroom effect is the opportunity it provides for structured, active learning and problem-solving.

Due to the educational values of flipped instruction for language learning, some studies have also probed into the effectiveness of this instruction on language learners' learning outcome or attitudes. The studies that have been carried out in the context of secondary education mostly focused on grammar performance and attitudes among EFL learners. Löfnertz (2016), for instance, investigated high-school students' perceptions of the flipped classroom approach considering the EFL classroom and grammar teaching in Sweden. The results indicated that students were positive towards implementing the flipped classroom and they found flipped classroom grammar teaching less anxiety-inducing. Similarly, Al-Harbi and Alshumaimeri (2016) examined the impact of flipped class on secondary school students' performances, perceptions, and attitudes toward learning English grammar independently. The results showed that adopting the flipped classroom strategy appeared to play a role in enhancing students' grammar performance. In addition, their attitudes towards using the flipped classroom strategy in the EFL class were found to be positive.

In another study, Warden (2016) utilized flipped instruction in teaching grammar to Italian learners of English. Data were collected through a mixed-methods approach involving a small amount of quantitative data gathered through a two-group pre-test post-test design. The results of the study showed that the participants had positive perceptions of the flipped class and the time they spent at home on their learning. They believed that in this approach the time of the class is mostly allocated to meaningful and communicative activities.

The studies that have been done in higher education context have generally focused on English major participants and how flipped instruction affected either their learning outcome or attitudes to learning. Zhang, Li, Jiao, Ma, and Guan (2016), for example, examined the effect of flipped class in teaching vocabulary to sophomore English students in a university in China. They integrated out-of-class watching video lectures with storytelling and in-class activities with educational games. The results showed that the experimental group's learning of vocabulary was significantly better than the control group. Adding elements of gamification in class activities created a sense of competition among students, enhanced their learning motivation, and inspired students to attend the class with more preparation.

Similarly, Hsieh, Huang, and Wu (2017) performed critical analysis of the dynamics embedded in EFL learners' technological acceptance in English Oral Training classes. A mixed methods design was employed to analyse multiple sources of data, including pre- and post-tests of oral proficiency, the TAM questionnaire, and semi-structured focus-group interviews. The results revealed positive effects of the mobile-based flipped instruction over the conventional lecture-based approach, and yielded the determinantal role of attitude about the use of the social media LINE in learners' subsequent behavioural intention to accept the integration of such technology in language learning.

In another study, Shyr and Chen (2018) designed a technology-enhanced flipped language learning system (Flip2Learn) to provide facilitation and guidance for learning performance and self-regulation in the Applied English course in a public university in Taiwan. A quasi-experimental study was carried out to examine the effects of whether Flip2Learn could enhance college students' self-regulatory skills and later contribute to the learning performance in the flipped classrooms. The results showed that Flip2Learn not only better prepared students for flipped classrooms but also better promoted learning performance compared to the conventional flipped classrooms.

In another study, Bakla (2018) examined the impact of learner-generated materials in a flipped classroom of English phonology among Turkish university students on enhancement of active and inquiry-based learning and attitudes towards flipped learning. The results of the study showed that learner-generated materials seemed to be a good option for learners to get involved

in research in a flipped class. The findings also revealed that although the learners reported mostly positive attitudes, radical changes as a result of both the use of the flipped model itself and new software and a lesson sequence based on thinking, production and research might constitute a major challenge for students that are accustomed to traditional methods.

Some studies have also been done on flipped class by Iranian researchers. Kheirabadi (2017) investigated the effect of flipped class in grammar instruction of grade 10 of high-school. The result did not show any significant effect for the flipped teaching; however, it caused enhancement of students' motivation and satisfaction, and teachers' instructional effectiveness and time management.

Haghighi, Jafarigohar, Khoshsima, and Vahdany (2018) investigated the impact of a flipped classroom on enhancing EFL learners' pragmatic competence. The findings revealed that the participants of the flipped group were more engaged with the course contents and significantly outperformed their counterparts in the conventional group in the post-test. Moreover, most participants of the flipped group enjoyed learning English in a flipped learning environment.

Amiryousefi (2019) investigated the effect of flipped classroom on EFL learners' L2 speaking, L2 listening, and out-of-class participation and engagement with course materials and activities. The results showed that flipped learning can help EFL learners improve their L2 speaking and listening and be more engaged with materials and activities outside of class.

Vaezi, Afghari, and Lotfi (2019) examined EFL students and teachers' perceptions about the role of implementing flipped teaching in the university context. The findings revealed that a majority of students held positive perceptions about engagement, effectiveness, attitudes, and positive affect through flipped instruction constructs in the flipped teaching class. University instructors also had an inclination towards implementing flipped teaching on the whole for the constructs named language improvement, attitudes about flipped instruction, better education through flipped instruction, and difficulty of implementing flipped instruction.

Zarrinabadi and Ebrahimi (2019) examined the impact of flipped classroom strategy to increase the amount of peer dialogue among a group of Iranian EFL learners. The analysis of audio-recordings of peer collaborative talk indicated that the flipped strategy, as compared to the traditional teaching, significantly increased collaborative peer dialogue among the learners.

As these studies showed, examination of the impact of flipped instruction in higher education is limited to some studies whose participants were English majors and the study of GE students' learning outcome in this regard is ignored in the literature. It is evident that both GE students and instructors face many challenges in GE courses such as students' low motivation and high learning anxiety, lack of background knowledge on the topic of the reading passages, and problems with language forms (Phuong, 2002). In-class time limitations for teachers and high load of out-of-class activities for students are among other challenges of the GE classes. In fact, teachers and students are under the pressure of covering particular contents to make students ready for the final achievement tests that are to be held. Further, most GE courses are not supported by technology-aided teaching materials (software or websites), and as a result, the students do not show much interest in studying these types of materials. Proficiency levels of students is also another source of problem in GE classes, as students with various language abilities attend GE classes and the lessons may be difficult for some students, while they might be easy for others. Therefore, keeping a balance between teaching effectiveness and managing the time becomes very challenging for most GE instructors. As such, flipped teaching seems to be a suitable teaching approach as it divides the instruction into two phases of out-of-class and in-class activities that give students the chance of learning the materials before the class considering their needs and background on the lesson. Further, the time of class can be allocated to cooperation and collaboration where students find the opportunity of clarifying their problems

and learn from each other under the instructor's guidance and support. Due to scarcity of research on using flipped instruction in GE courses in Iran, this study examined the impact of flipped instruction on learning outcome of GE students. The study aimed to answer the following research question:

RQ. Does a flipped class have any significant impact on Iranian GE students' learning outcome?

Method

Participants

The participants of the study included 50 sophomores of engineering majors enrolled in GE courses in Islamic Azad University, South Branch in the academic year 2018-2019. The enrolment of students was done by the office of education and thus students were randomly assigned into different GE classes. From available GE classes, two intact classes were randomly selected and were assigned to be the control group (n=25) and the experimental group (n=25). The sample included both male (n=33, 66%) and female students (n=17, 34%).

Instrumentation

In order to assess the participants' learning outcome, an achievement test was used. In line with the goals of GE courses that mainly include mastering grammatical structures and vocabulary learning, the test had 35 items organized in two sections: grammar part (16 items) and vocabulary part (19 items). The following steps were followed to develop the test and use it as the pre- and post-test:

- a. Table of specification of structural points and vocabulary items was constructed and checked "to assure ... that the test includes a representative sample of the materials covered" (Farhady, Jafarpur, & Birjandi, 2009, pp. 86-87).
- b. Pretesting: The test was piloted with 100 examinees with characteristics similar to the sample of the study to check test reliability and item characteristics.
- c. Revising: Based on the results gained in the previous steps, some minor revisions were made to a few items.
- d. Test administration: The test was administered both as the pre-test prior to the study and the post-test after the experiment.

The reliability of the test was estimated by KR-21 and found to be .76 for the pre-test and .87 for the post-test.

Instructional Content

Both the experimental and control groups studied the same textbook for their GE course (Kasikhan, 2016). The content of each lesson was organised in the following three main parts:

- (1) Grammar-oriented texts
- (2) Vocabulary building texts on the latest scientific and social news.
- (3) Study Skills with three sections: dictionary skills, speed reading techniques, and morphology

The instructor also prepared the audio and video recordings for the instruction for the experimental group. The audio files were recorded by a digital media player and the video files were recorded by a cell phone. The pre-class contents were given to the experimental group via social media Telegram.

Procedure

The study took place in the academic year 2018-2019 and lasted for 16 weeks. The students attended the classes once a week and each session lasted for 150 minutes. Two sessions

were devoted to administering the pre-test and post-test. All participants sat the pre-test and their entry level knowledge of vocabulary and grammar was checked prior to the study. The students of the experimental group were then introduced to the instruction, how it was going to be implemented by the instructor, what they were expected to do, and what type of technology they needed for the course. The procedure of teaching in each group is explained below:

The flipped class: The instruction was based on the flipped instruction consisting of two phases: pre-class and in-class. The pre-class teaching content included vodcasts and podcasts delivered to the students via the social media Telegram. The students were asked to watch the vodcasts or listen to the podcasts and do as the teacher instructed them in the pre-class phase including completing task sheets, taking notes, generating or answering questions, and writing summaries. The time of the class was allocated to group work, asking and answering questions, and doing interactive activities (Table 1, adapted from Hsieh, 2017).

Table 1

In-class interactive activities (Adapted from Hsieh, 2017)

Activity	description	Goal
Think-Pair-Share	Students write or think about a given prompt/question, then share with a partner before sharing aloud	Increase and scaffold student participation
Class discussion	Students discuss class topic in small or large groups	Deepen understanding, share perspectives
Jigsaw Readings	Students are assigned different segments of a particular text to become expert on. They share their understandings of their segment of the text in small groups and learn from peers about other assigned sections.	Reduces cognitive load by chunking reading material; encourages interaction, participation and accountability for knowledge
Group work on problems set	Students work in groups on challenging problem sets	Scaffold understanding through peer interaction and instructor support
Rubric-based feedback	students receive peer and instructor feedback using rubrics	Students interact with rubric criteria, understand how to improve

Conventional instruction: The instruction was delivered through conventional teaching techniques where no specific technology was used to teach the content. At the end of the course, both groups participated in the post-test.

Results

In order to answer the research question of the study, multivariate analysis of variance (MANOVA) was conducted. In this analysis, the achievement test served as the dependent variable and the type of instruction (2 levels: flipped instruction vs. conventional teaching) was the independent variable. Preliminary assumption testing was conducted before using the main MANOVA analysis to check for normality, linearity, multicollinearity, and homogeneity of variance-covariance matrices (Pallant, 2020).

The result of normality for the achievement test is shown in Table 2. As indicated under the Sig. column, the Kolmogorov-Smirnov statistic is not significant ($p=.05$), this assumption is fulfilled.

Table 2*Tests of normality*

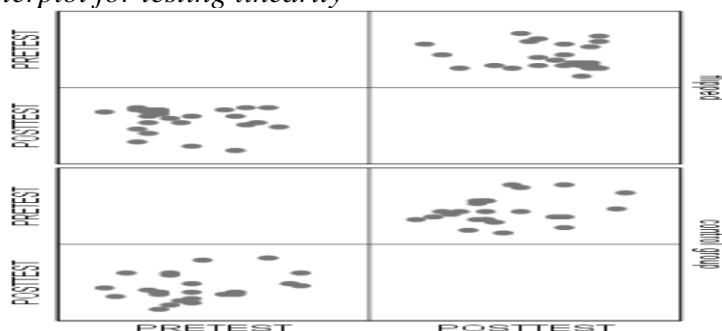
	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Achievement test	.122	50	.060	.970	50	.240

Mahalanobis distance was calculated to test the multivariate normality of the sample. As Table 3 below shows, the maximum value for Mahalanobis distance for post-test scores is 3.836. This value was compared with the critical value in chi-square table for two dependent variables (13.82) and no multivariate outliers in the data are observed as the Maximum Mahalanobis value is smaller than the critical value.

Table 3*Residual's statistics of post-test scores*

	Minimum	Maximum	Mean	Std. Deviation
Predicted Value	20.60	77.59	50.52	15.276
Std. Predicted Value	-1.959	1.772	.000	1.000
Standard Error of Predicted Value	5.075	11.227	6.985	1.598
Adjusted Predicted Value	15.98	82.42	50.50	15.716
Residual	-66.214	74.024	.000	35.444
Std. Residual	-1.849	2.067	.000	.990
Stud. Residual	-1.921	2.163	.000	1.013
Deleted Residual	-71.454	81.020	.023	37.105
Stud. Deleted Residual	-1.978	2.252	.002	1.025
Mahal. Distance	.004	3.836	.980	.940
Cook's Distance	.000	.221	.024	.042
Centered Leverage Value	.000	.078	.020	.019

The assumption of linearity was assessed by generating a matrix of scatterplots between each section of achievement test, separately for experimental and control groups. As Fig. 1 shows, no evidence of non-linearity is observed; therefore, the assumption of linearity is satisfied.

Figure 1*Scatterplot for testing linearity*

The correlation among two parts of the achievement test was calculated to test this assumption. As the values of correlation between these two sections of post-test ($r=.586$, $p=.000<.05$) does not exceed .9, this assumption is satisfied.

Box's Test of Equality of Covariance Matrices was conducted in order to examine whether the data violated the assumption of homogeneity of variance-covariance matrices. As Table 4 shows, the significance value is larger than .001 ($p = .432$), hence the assumption of homogeneity of variance-covariance matrices was met.

Table 4

Box's Test of equality of covariance matrices

Box's M	2.284
F	.727
df1	3
df2	414720.000
Sig.	.536

As no serious violation of any assumptions was observed, MANOVA was performed. The result of multivariate tests is presented in Table 5.

Table 5

Multivariate tests

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
group	Pillai's Trace	.189	5.464	2.000	47.000	.007	.189
	Wilks' Lambda	.811	5.464	2.000	47.000	.007	.189
	Hotelling's Trace	.233	5.464	2.000	47.000	.007	.189
	Roy's Largest Root	.233	5.464	2.000	47.000	.007	.189
Root							

As Table 5 above shows, there is a significant difference between control and experimental groups' performance in combined dependent variables [Wilks' Lambda=.811; $F(2, 47) = 5.464$; $p=.007$; $\eta_p^2=.189$]. Therefore, dependent variables can be checked separately. However, before interpreting tests of between-subjects' effects, Levene's Test of Equality of Errors Variances was examined (Table 6).

Table 6

Levene's test of equality of error variances

Variables	Levene Statistic	df1	df2	Sig.
Vocabulary section	.242	1	48	.625
Grammar section	1.124	1	48	.294

As Table 6 shows, equal variances are assumed and none of the variables indicated any significant values at the level of $p=.001$.

As the result of tests of between-subjects effects shows (Table 7), when the dependent variables are considered separately, both differences for vocabulary section [$F(1, 48) = 9.189$, $p=.004$, $\eta_p^2=.161$] and grammar section [$F(1, 48) = 7.441$, $p=.009$, $\eta_p^2=.134$] reached the statistical significance.

Table 7*Tests of between-subjects' effects*

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Vocabulary	112.500	1	112.500	9.189	.004	.161
	Grammar	74.420	1	74.420	7.441	.009	.134
Intercept	Vocabulary	6704.820	1	6704.820	547.630	.000	.919
	Grammar	6160.500	1	6160.500	615.947	.000	.928
Group	Vocabulary	112.500	1	112.500	9.189	.004	.161
	Grammar	74.420	1	74.420	7.441	.009	.134
Error	Vocabulary	587.680	48	12.243			
	Grammar	480.080	48	10.002			
Total	Vocabulary	7405.000	50				
	Grammar	6715.000	50				
Corrected Total	Vocabulary	700.180	49				
	Grammar	554.500	49				

It should be noted that based on Cohen's guideline (1988), the effect size for the intervention for the vocabulary is large ($\eta_p^2=.161 > .14$) and for grammar is medium ($\eta_p^2=.134 < .14$).

Moreover, the descriptive statistics of the achievement test (Table 8) shows that the experimental group outperformed the control group in achievement test in general and its two sections, specifically i.e., vocabulary and grammar.

Table 8*Descriptive statistics for post-test scores*

Variables	Group	Mean	SD
Achievement test	Control	19.960	6.106
	Experimental	25.400	5.408
Vocabulary	Control	10.08	3.604
	Experimental	13.080	3.390
Grammar	Control	9.880	3.527
	Experimental	12.320	2.749

Discussion

The main aim of the present study was investigating the impact of flipped instruction on EFL learners' learning outcome in comparison to a conventional instruction.

The results of the study primarily revealed that the experimental group outperformed the control group in achieving higher levels of learning outcome in learning English. This finding supports the fact that flipped instruction is a useful and advantageous teaching strategy for teaching general English because it can tackle the problems of learning motivation, time, and high load of teaching materials that both students and instructors face in GE courses. This being so, the students benefit from richer instructional content as pre-class activities and their collaboration during the instruction are enhanced. The instructor has more time during the class time to focus on students' learning problems, and thus learning motivation and outcome will increase.

The finding corroborates the theoretical underpinnings of flipped instruction that flipping the course allows easy access to teaching materials by means of mobile devices and video playing platforms on the Internet, it can provide the active use of class time, it enables students to move at their own pace, and in case they are unable to participate in the class due to various reasons, they are given some opportunities to learn about topics that are taught outside the class hours (Bergmann & Sams, 2009; Fulton, 2012; Noroozi, Rezvani, & Ameri-Golestan, 2021).

The finding is also in agreement with the empirical studies that underscored the benefits of flipped instruction for learning outcome (e.g., improving learning performance satisfaction, engagement, and motivation), pedagogical contributions (e.g., flexible learning, enhancing enjoyment, better preparation before class, fostering autonomy, enabling more feedback, providing peer-based learning, increasing study effort, supporting interest in the course, decreasing withdrawals), time efficacy (e.g., efficient class time, more time for practice), dispositions (e.g., positive feedback, perceptions, attitudes), and interaction (general, student to student, student to instructor) (Akçayır & Akçayır, 2018).

Further, the result of the study revealed that the experimental group outperformed the control group in vocabulary learning. First, it can be assumed the advantage of flipped instruction to conventional teaching was it provided pre-class materials in the form of audio-video taped files and the students had the opportunity to go through these materials for learning the new words of the lesson. It is known that vocabulary learning needs multiple resources for presentation and practice and more exposure to contextual input is a key factor in vocabulary teaching (Thornbury, 2002). Vocabulary learning and retention is not a simple task and it needs a great deal of attention and practice from the learners' side. When it is supported by diverse activities, the learning and retention of new words are amplified.

Moreover, there was a fundamental difference between the nature of input for the two classes, as in the flipped course the input was multimodal (audio, video, text) but the conventional class had just the printed materials as the input. The modality of the input plays a key role in information processing on account of the fact that it can reduce the load of the learning task (Sweller, Ayres, & Kalyuga, 2011). The way the teaching materials are designed and delivered (i.e., using multimodal input), especially in teaching difficult subject matters, can reduce the extraneous load of the learning task and helps the learners feel less pressure in processing the information. When multimodal instructional materials are prepared in flipped instruction and are delivered before the class, the load of learning tasks is managed and thus the capacity of working memory increases. Further, this type of input gives students with diverse learning preferences (audio, visual) the chance of benefiting from the instructional materials and thus they become engaged in active learning that ultimately leads to better remembering and retention of the learned words. As Qian (1999) stated, the knowledge of pronunciation, spelling, morphological and syntactical properties, how the words combine to other words, and multiple meanings of the words should be taken into consideration for vocabulary learning. Moreover, this type of input gives learners opportunities to deploy different types of vocabulary learning strategies (VLSs) such as determination, discovery, social, consolidation, memory, cognitive, and metacognitive VLSs (Schmit, 1997), because using multimedia in vocabulary instruction increases VLS use and awareness (Rahimi & Allahyari, 2019). The benefit of using VLSs in technology-based learning environments is that learners become more autonomous and self-directed, resulting in better vocabulary learning.

Moreover, the result of the study with respect to the effect of flipped instruction on participants' grammar achievement revealed that the experimental group outperformed the control group in grammar achievement. One reason for this finding is that while students of the flipped instruction used a variety of out-of-class instructional materials, they became more prepared in the class and the time of the class was spent on higher order cognitive activities rather

than just focusing a lot on language forms. In this way the lower order cognitive activities including understanding and remembering were carried out before the class and learners had a lot of time for learning deeply before entering the class. Afterwards, the cognitive activities of upper level including applying, analyzing, evaluating and creating were carried out by the presence and support of the instructor and other students in the class time.

Flipped instruction provided students with different types of authentic resources for learning grammatical structures before coming to the class. In the class what was learned out of class was reinforced by group, pair, and individual work while the teacher served as the facilitator. This made the learning of grammar as communicative as possible by emphasizing the three-dimensional teaching strategy of teaching grammar (form, meaning, use) (Larsen-Freeman, 2014). That is, not only the forms of the grammatical structure were taught, but also their meaning and use were supported through extensive reading activities, meaningful exercises, and in-class communicative tasks.

The findings also showed that the effect size for grammar achievement was not as strong as vocabulary learning. Grammar is one of the neglected areas in the literature of EFL flipped instruction. Those studies that have been done on the issue of the effect of flipped instruction on grammar learning at school level have not reported any significant advantages for flipped instruction over conventional teaching with respect to learning outcome, although most of them reported positive attitudes towards this approach (e.g., Kheirabadi, 2017; Al-Harbi & Alshumaimeri, 2016). The finding of this study underscores the fact that these positive attitudes can guarantee better learning outcome in upper stages of learning English grammar as flipped instruction makes students feel more satisfied with their learning experience (Pudin, 2017); and out-of-class activities makes them believe that they are learning grammar for real purposes (Warden, 2018).

Conclusions

The current study examined the impact of flipped classroom on GE students' learning outcome in general and achievement in grammar and vocabulary learning in particular in comparison to a conventional teaching method.

The findings of the study underscore the importance of blended learning and incorporating technology appropriately in GE classes in line with pedagogical principles. Flipped instruction has certain advantages for GE courses as it gives flexibility to students with respect to freedom with schedule and assignments as well as having an anywhere or anytime learning experience. Additionally, it supports teacher's capability to expand and deliver the learning experience outside the classroom and thus saving the time for more critical issues to be covered in class time.

The findings of the study can be beneficial for language instructors and EFL materials developers. When technology is used for materials preparation and delivery, the instructor has more time during the class to focus on students' learning problems, resulting in an increase in learning outcome, autonomous learning, motivation of students, and opportunities of language practice. By using innovative strategies such as flipped instruction, EFL materials developers can design more personalized instructional materials addressing the needs of language learners with diverse learning styles and preferences. Using technologies helps them prepare multimodal materials and thus making different types of learners interested in the content.

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