



An Exploration into EFL Learners' Vocabulary Learning in Flipped Classrooms

Nouroddin Yousofi¹
Saba Bashiri²

¹Associate Professor, Department of English Language and Literature, Faculty of Persian Literature and Humanities, Razi University, Kermanshah, Iran

²Ph.D. Candidate, Department of English Language and Literature, Faculty of Persian Language and Humanities, Razi University, Kermanshah, Iran

ARTICLE HISTORY

Received: 27 August 2022
Revised: 27 October 2022
Accepted: 24 January 2023
Published: 01 March 2023

CORRESPONDING AUTHOR

E-mail: nyousofi@yahoo.com

ABSTRACT

Utilizing a sequential exploratory mixed-methods design, this study investigated the effects of flipped classrooms on Iranian EFL learners' vocabulary learning. Thirty Iranian EFL learners, who were enrolled in an upper-intermediate class at a private language school in Iran, were randomly divided into two groups: the experimental group (the flipped learning group) and the control group (the traditional learning group). Pre-tests and immediate post-tests were administered via the DIALANG online diagnostic test which was also utilized to assess the learners' current vocabulary level to explore the effects of flipped classrooms on the learners' vocabulary learning. Semi-structured interviews along with students' weekly journals were used to collect the qualitative data. The results of paired- and independent-sample t-tests showed that the experimental group performed better in the post-test both compared to their pre-test and the control group's post-test. Thematic analysis of the qualitative data indicated that the flipped classroom enhanced the experimental groups' knowledge of vocabulary, class participation, interaction, and engagement, although some of the participants were not accustomed to such an instructional method and preferred being instructed by the teacher and do the activities individually in the classroom. The study implications will be discussed.

KEYWORDS: flipped learning; EFL vocabulary learning; EFL learners

1. Introduction

One of the most important aims of language teaching is to help learners to improve different skills and language components. The field is being penetrated by the different technologies which are increasing and advancing rapidly (Chakowa, 2018). In line with the technological advancements, in both mainstream and language education, stakeholders have been propelled to take advantage of either e-learning or flipped classrooms. Flipped classrooms combine face-to-face and distance education to render what is called blended learning (Santikarn & Wichadee, 2018) and shift the learning atmosphere into a dynamic interactive environment (Bergmann & Sams, 2012) by requiring the learners to do pre-and post-class tasks in order to take advantage of in-class time (Tawfik & Lilly, 2015). An important point regarding flipped classrooms is that both learning types, i.e. face-to-face in-class and online, are integrated and none of them is prioritized over or marginalized for the sake of others (Garrison & Kanuka, 2004). Information technologies intervene in the flipped classrooms to complete knowledge teaching after the face-to-face class time (Wei, 2019), but knowledge internalization takes place with the aid of the teacher and the classmates during the class (Jinlei et al., 2012). Positive results of flipped learning in both L2 and mainstream education are

reported in the literature, including more individualized learning and more learners' satisfaction (Cho & Lee, 2016) significantly increased academic achievement and better performance (Adnan, 2017; Bang, 2017; Pyo, 2017; Wu et al., 2019) more academic self-efficacy (Pyo, 2018) higher teaching efficiency (Knežević et al., 2020), more engagement, learning motivation, and interaction (Ahmed et al., 2022; Challob, 2021; Chuang, 2018; Zainuddin & Halili, 2016). Positive students' perceptions of flipped classrooms are also reported in several studies (Hung, 2015; Lee, 2021; Nugroho & Fitriati, 2021; Teng, 2017; Webb et al., 2014; Yang, 2017).

Previously ignored compared to grammar and structure, vocabulary is now an important aspect of English language teaching (ELT) (Kim, 2018). As one of the challenging and key language components to be mastered by L2 learners (Alghamdi, 2019; Lin & Lin, 2019) vocabulary learning is the foundation for mastering an additional language (Schmitt, 2010). According to Burston "Without grammar very little can be conveyed, without vocabulary nothing at all can be conveyed." (as cited in Katemba, 2019, p.2). L2 vocabulary acquisition is facilitated by the numberless language resources and apps introduced by language technologies (Ma, 2017). The literature on technology-aided language learning is replete with studies the main target of which is vocabulary development (Stockwell, 2007). For instance, L2 vocabulary experiences can be facilitated by virtual environments and virtual reality technologies (Tai et al., 2020; Tseng et al., 2020), media and multimedia technologies (Alhamami, 2016; Arndt & Woore, 2018; Montero Perez, 2020; Peters & Webb, 2018; Ramezanali & Faez, 2019; Shadiev et al., 2020; Teng, 2020; Wang, 2019; Wong & Samudra, 2019), and the social media can also intervene to aid both learners and instructors in the process of vocabulary learning (Amer, 2014; Chen et al., 2018; Dehghan et al., 2017; Khansarian-Dehkordi & Ameri-Golestan, 2016; Ko, 2019; Ma & Yodkamlue, 2019; Terantino, 2016).

More specifically, investigating the role of flipped classrooms on vocabulary learning is also burgeoning across different language learning courses. According to Knežević et al. (2020), English academic vocabulary can be instructed more efficiently compared to the conventional approach. In Turkey, Özkal (2019) found that pre-intermediate EFL learners benefitted more from learning vocabularies through flipped classrooms. To the researchers' best knowledge, few studies were conducted on the effectiveness of flipped vocabulary learning among Iranian EFL learners (Fahandezh & Mohammadi 2021; Jalili, et al., 2020; Rezaei Fard et al., 2021). As there seems to be little information about the effects of flipped classrooms on upper-intermediate Iranian EFL learners' vocabulary learning, this study aimed at exploring the issue. Vocabulary was selected as the target component to be explored as the participants were on the verge of entering the advanced classes in which they would need to produce and comprehend a good number of vocabulary and lexical items in order to gain mastery of other language skills; furthermore, they were eager to attend a vocabulary course before attending advanced classes. The aspects of vocabulary knowledge being measured to trace the learners' improvement were word combination, word formation, semantic relations, and meaning. These criteria were selected based on the DIALNG diagnostic online test, taken by the participants, as they seemed to be troublesome for them. The following research questions guided this study:

1. To what extent do flipped classrooms affect the EFL learners' vocabulary learning?
2. What are the EFL learners' perspectives and perceptions about flipped vocabulary learning in terms of its perceived benefits and associated challenges?

2. Review of literature

The advent of technologies across teaching practices, along with all spheres of modern life, led the practitioners to embrace new instructional methods one of which was flipped learning introduced by Bergmann and Sams (2012), two chemistry teachers in the USA. Despite being a novel instructional approach, FL is not an original term (Berrett, 2012) and different terms have been used to refer to it, including inverted classroom (Lage & Platt, 2000) just-in-time teaching (Novak, 2011) and inverted learning (Davis, 2013). Bergmann and Sams (2012) stated that FL is a class in which "which is traditionally done in class is now done at home, and that which is traditionally done as homework is now completed in class" (p. 13). Therefore, flipped classrooms, as opposed to traditional classrooms, have two phases: the pre-class learning phase and the in-class student-centered phase (Network, 2014).

The most prevalent learning theory underlying FL is Vygotsky's (1978) sociocultural theory (SCT) of mind which states that all human learning is social, not individual. The main focus of this theory is on engaging students in practical activities (Lantolf & Poehner, 2014) during which interaction occurs and leads to human mental and behavioral development and functioning (Lantolf & Thorne, 2006). It has been argued that this development occurs within the person's zone of proximal development (ZPD) via mediation, which are two main terms in SCT (Lantolf et al., 2015). According to Vygotsky (1978, 1998), mediation helps the still-developing abilities to come to the surface. One of the mediating tools in flipped classrooms is the pre-class content shared by the teacher which then is discussed in pairs/groups during the in-class phase and leads scaffolding to happen (Loucky & Ware, 2016). Scaffolding happens in a social situation in which a more knowledgeable person (in this case, peers or teachers) helps the beginner to develop his/her ZPD using language and available tools (Donato, 1994; Turuk, 2008). This scaffolded functioning later becomes internalized by the learners and he/she can function independently and reach autonomy. Autonomy is defined as a learner's ability in goal-setting, self-generating opportunities for practice and learning, and self-evaluating their improvement (Cotterall, 1995).

The positive impacts of FL have been well substantiated in teaching different language skills and components. The effects of FL on Cambodian pre-university EFL learners' listening skills were explored by Roth and Suppasetseree (2016). The results showed the outperformance of the group who received the instructional material in the flipped classrooms and who also thought positively about the effectiveness of the method. In the same vein, Ahmad (2016)'s study on 34 third-year Egyptian EFL learners in a one-group pre-posttest study design showed the positive effects of flipped learning on their listening comprehension. Santikarn and Wichadee (2018) assessed the speaking and writing performance and perceptions of 40 advanced Thai EFL students who were instructed in an English course via flipped learning. Using multiple data collection instruments, they realized that the learners' performance improved significantly after the flipped course as revealed via their scores. In addition, they perceived the course to be satisfactory in making them autonomous learners. Yuliani et al. (2018) investigated the effectiveness of project-based flipped learning on 40 Indonesians' writing performance. They concluded that the flipped classroom was more successful in rendering competent writers, besides bringing about engagement and enjoyment in the flipped learners. Huang and Hong (2016) and Brown (2018) found that English learners enhanced their reading comprehension as a result of attending flipped reading classes and were satisfied with what happened to their reading abilities and autonomy. Moran (2014) opted to investigate not only 49 English Language Arts (ELA) students' emotional and behavioral engagement but also 143 teachers' pedagogical practices with flipped classrooms. The result was that the learners in the flipped classrooms increased their intrinsic and extrinsic motivation, and became more hardworking and organized compared to those who were in the traditional classrooms. Some of them reported that they experienced demotivation during the final flipped sessions, although they enjoyed them at the outset. More knowledgeable ELA students felt more comfortable with the nature of the flipped classes than those who were lesser successful, in other words, less competent ELA students felt frustration. The teachers asserted that their attitudes towards and their comfort with the method were dependent upon the class size, such that small classes size was more successfully instructed via FL.

During the history of foreign language teaching, different methods waxed and waned each of which treated each language skill and component, including vocabulary, differently. According to Carter & McCarthy (2014) and Schmitt (2010) until the 1980s, vocabulary was not paid considerable attention and after then L2 researchers got interested in vocabulary teaching (1997). Zhang et al. (2016) explored the adjustment and effects of vocabulary teaching strategies in a flipped classroom. Chinese EFL freshmen were divided into experimental and control groups in a mixed-methods study in order to compare traditional and flipped vocabulary learning methods. The flipped classroom performed better than its counterpart in the post-test. Furthermore, they had positive attitudes toward the classes in terms of better vocabulary learning, more class discussions to overcome problems, and more activity engagement. On the other hand, the control group deemed traditional vocabulary instruction time-consuming and not conducive to word memorization. Fifty-seven Korean EFL learners were the participants of a study by Kim (2018) which investigated the impact of FL on receptive and productive vocabulary learning. Based on the immediate post-test scores, the experimental group performed better than the control group. To explore the true impact of the treatment, delayed post-tests were also administered the results of which showed the endurance of the flipped classrooms' positive impact. Another intermediate EFL vocabulary class in Saudi Arabia was flipped by Alnuhayt (2018) in order to trace the impacts on the 45 students. In line with the last two studies, FL was conducive to vocabulary knowledge improvement and students' positive perceptions of them.

Jalili et al. (2020) focused on intermediate Iranian EFL learners' vocabulary development via flipped classrooms in a mixed-methods study. To the researchers' surprise, the traditional method of vocabulary instruction was superior the flipped model as the control group performed better on the post-test, and the rather obvious consequence was to the experimental groups' dissatisfaction with these classes. In a novel trend utilizing gamified flipped classrooms, Fahandezh and Mohammadi (2021) found that Iranian female EFL learners enhanced their vocabulary knowledge as a result of being provided the content in an interesting and creative context. To the best knowledge of the researchers, there are still issues to be explored regarding flipped vocabulary learning in the Iranian EFL context which should be fulfilled via conducting more empirical studies. This research aims to explore the same issue by targeting upper-intermediate EFL learners in a mixed-methods study design the first phase of which is experimental and the latter is an interview- and reflective-journals-based.

3. Method

3.1. Design

Quantitative and qualitative data were used in this study as we followed a sequential exploratory mixed-methods design. QUAN → QUAL mixed-methods type (Dornyei, 2007) was used based on which quantitative data is collected followed by the qualitative data. The quantitative data was gathered via pre-and post-tests and the qualitative data was collected through follow-up semi-structured interviews and students' weekly journals. We adopted this study design in order to elaborate more on the quantitative results through an in-depth analysis of the qualitative data (Dornyei, 2007; Riazi, 2016).

3.2. Participants

The sampling method used to select the study participants was the convenience sampling method (Dornyei, 2007). This study selected two intact upper-intermediate classes at a private language institute in Iran. There were 15 students in each class one of which received flipped vocabulary instruction and the other received traditional vocabulary instruction. They were all female learners whose ages ranged from 15 to 25 and their proficiency level was assured via the institute's standards and the DIALANG online diagnostic test. Based on the Common European Framework of Reference for the Languages (CEFR), both groups' vocabulary skills were at the B2 level. Pseudonyms are used in reporting the qualitative data results in order to protect the participants' privacy and assure their anonymity. Debriefing sessions were held before the treatment sessions during which the participants were provided with enough information about the study procedure and were given the freedom to withdraw without any penalties or need for compensation (Mackey & Gass, 2015). No participants in the study had prior experience of attending flipped classrooms and all of them were native Kurdish speakers, attending the private English school for almost five years, were at the same proficiency level, and all had access to the internet, computers, and personal email accounts.

3.3. Instrumentation

Research instruments in this study consisted of the DIALANG online diagnostic test, multimedia material for the treatment sessions, students' weekly journals, and semi-structured interviews. The DIALANG test diagnoses the language proficiency level in 14 European languages and delivers the results based on the Common European Framework of Reference for Languages (CEFR) from A1 (the least proficient) to C2 (the most proficient) in different language skills and components. The participants' proficiency level and their pre-and post-test scores were collected via this online test which is available at <https://dialangweb.lancaster.ac.uk/>.

The multimedia materials were prepared by one of the researchers who was also the course instructor of both groups. Vocabulary items from the book *504 absolutely essential words* (Bromberg et al., 6th edition) were selected to be taught in the treatment sessions, such that each lesson that included 12 words was covered during one single session. The lessons for the flipped classroom were instructed via PowerPoint slides prepared by the instructor. Each PowerPoint file contained the 12 vocabularies of a single session and each item included the following parts: part of speech, pronunciation (teachers' voice), a picture depicting the word, English definition, and contextualizing the word in sentences. (Appendix A). This group was also provided with a tutorial screen recording on how to search for online dictionaries and how to work with dictionary apps.

The students in the experimental group were asked to keep weekly journals and reflect on what aspects of vocabulary knowledge they had mastered more in this way and what affordances and challenges they faced during the flipped classes. Follow-up semi-structured interviews were conducted with eight students in the experimental group to tap into their perceptions towards attending flipped vocabulary learning classrooms. A total of four guiding questions were asked in Persian after being piloted by asking three non-participant students in the same institute in order to remove any ambiguities (Appendix B). All interview sessions were held individually in the institution and recorded, during which any popping-up points were clarified by both parties.

3.4. Procedures

This study was conducted for a total of 18 sessions during nine weeks (two 90-minute sessions per week). Right before starting the actual instructional sessions, all the students took the English vocabulary test of the DIALNG online test to determine their proficiency level (session one). The scores were recorded as the pre-test scores and no feedback was given to the students on their performance on the test. During the 15-session experimental period, the experimental group (flipped group, FG) received vocabulary instruction in flipped classrooms, while the control group (traditional group, TG) received instructions on the same vocabulary in traditional classrooms (sessions 2-16). The PowerPoint slides were shared with the FG one day before the face-to-face class via their emails. They were required to practice the pronunciation and part of speech and learn the word definition/meaning. Furthermore, they were asked to find synonyms and antonyms, find different collocations and combinations, and practice word-formation techniques to change the word into different parts of speech, e.g. via using affixes. These all had to be done in the slides to which specific spaces were allocated and then sent back to the teacher by the determined time. The same tasks formed the basis of class practices and discussions. During face-to-face classes, they formed three groups of five members (group members were subject to change each session) to answer the instructors' questions and take part in interactive activities to demonstrate what they have learned at home. After sharing their ideas on each lesson, each group had to write a short essay containing the lexical items covered in that session which was then shared with the teacher. All the participants' weekly journals were collected in the last treatment session.

The same vocabulary items were instructed to the TG following the conventional method which included: reading each word aloud in class and asking the students to repeat it, practicing its pronunciation and definition, thinking about synonyms, antonyms, different parts of speech, and collocation/combinations in a teacher-centered manner. This group was also asked to compose a short essay containing whatever they had learned in that session. The difference was that this task was done individually at home and was then submitted to the teacher the next session.

After finishing the treatment session, all the participants took an immediate post-test (three days after the last session using the DIALING online test [session 17]). Both pre-and post-tests were conducted in the institution based on a schedule and under specific time limitations. Finally, follow-up interviews were conducted individually in the 18th session. Each interview session lasted about 15-20 minutes and was audio-recorded for further analysis.

3.5. Data analysis

SPSS version 26 was used to conduct the quantitative data analysis. To compare the differences within and between groups, paired-sample t-tests, and independent-sample t-tests were calculated, respectively. The data obtained via participants' weekly journals and semi-structured interviews were analyzed via thematic analysis.

4. Results

4.1. Quantitative results

4.1.1. Pre- and post-test differences within each group

A paired-sample t-test was carried out to compare the pre-and post-test scores of each group. As Table 1 indicates, the TG's pre-and post-test scores were different from each other ($\text{sig} < 0.05$), but as shown in Table 2 this difference was not so significant as the pre-test mean was (21.07) and the post-test mean was (22.60).

The FG's pre-and post-test were also significantly different from each other ($\text{sig} < 0.05$) as shown in Table 3. But here the difference was larger and showed that the FG performed better in the post-test as the mean scores in Table 4 show.

Table 1. Paired samples t-test for the TG

	Mean	SD	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
pre-test.T	-1.533	1.506	.389	-2.367	-.700	-3.944	14	.002
post-test.T								

Table 2. Paired samples statistics for the TG

Pair		Mean	N	SD	Std. Error Mean
	pre-test.T	21.07	15	3.369	.870
	post-test.T	22.60	15	2.613	.675

Table3. Paired samples t-test for the FG

	Mean	SD	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
pre-test.F	-4.067	3.575	.923	-6.046	-2.087	-4.406	14	.001

post-test. F

Table 4. Paired samples statistics for the FG

		Mean	N	SD	Std. Error Mean
Pair	pre-test.F	22.73	15	3.595	.928
	post-test.F	26.80	15	2.624	.678

4.1.2. Pre- and post-test differences between groups

We carried out two independent samples t-tests in order to find out whether there were any significant differences between the two groups in terms of their pre-and post-test scores. Table 5 shows that $\text{sig} < 0.05$, so there was a difference between the groups' pre-tests but the mean scores (FG mean score= 22.73; TG mean score= 21.07) indicated that this difference was meager and insignificant (Table 6).

Table 5. Independent samples t-test for the pre-tests

				95% Confidence Interval of the Std. Difference		t	df	Sig. (2-tailed)
Mean	SD	Error Mean		Lower	Upper			
pre-test.F	1.667	2.895	.747	.063	3.270	2.230	14	.043
pre-test.T								

Table 6. Independent samples statistics for the pre-tests

		Mean	N	SD	Std. Error Mean
Pair	pre-test.F	22.73	15	3.595	.928
	pre-test.T	21.07	15	3.369	.870

Although there was not a great difference between the FG and the TG in their pre-test scores, the independent samples t-test statistics of the post-tests revealed that there was a significant difference between their post-tests ($\text{sig} < 0.05$, as shown in Table 7). Furthermore, Table 8 indicated that the FG performed significantly better (mean score= 26.80) than the TG (mean score= 22.60) in their post-test.

Table 7. Independent samples t-test for the post-tests

	Mean	SD	Std. Error Mean	95% Confidence Interval of the Difference		t	Df	Sig. (2-tailed)
				Lower	Upper			
post-test.F	4.200	3.167	.818	2.446	5.954	5.137	14	.003
post-test.T								

Table 8. Independent samples statistics for the post-tests

Pair		Mean	N	SD	Std. Error Mean
	post-test.F	26.80	15	2.624	.678
	post-test.T	22.60	15	2.613	.675

4.2. Qualitative results

For answering the second research question, the data obtained via conducting semi-structured interviews and weekly journals, kept by the students, were analyzed following a thematic analysis procedure. Out of the transcribed interviews and written journals, a set of themes emerged. Table 9 depicts a detailed elaboration of the results. Students' quotations will be reported anonymously by using pseudonyms including F1, F2, F3, F4, F5, F6, F7, and F8.

Table 9. Themes, codes, and segments extracted from the qualitative data

Themes	Codes	Segments
Perceived benefits	<i>-Pedagogical benefits</i>	-Different and more activities to do
		-Feeling more self-responsibility and autonomy for learning
		-Enjoying learning from discovering
		- More preparation for in-class participation
		-More engagement in the learning process
	<i>-Social benefits</i>	-Spending in-class time more efficiently
		-Gaining more profound knowledge of words
		-Better memorization of the lessons
		-Not being forced to answer without preparation
		-Not feel frustrated to take part in classroom activities
		- Sharing knowledge with classmates fostered social interaction

Associated challenges	-Pedagogical challenges	- Preferring teacher's explanations -Not suitable for those who prefer individual activities - Not being accustomed to such instruction -Preferring to think within classrooms confines
	-Material-related challenges	-Problems with downloading the file -Preferring video materials instead of audio -Time-consuming

Table 9 shows that the FG experienced both benefits and challenges during the vocabulary courses instructed via flipped classrooms. With regard to the perceived benefits, data analysis revealed two broad categories: pedagogical and social. According to F3 requiring the students to do more activities was a good instructional method:

Indeed, we did activities in our previous courses, but the nature and amount of activities differed here, as we had to surf different resources to find what was required.

Being responsible to solve the tasks at home helped learners to practice autonomy:

I think the assignments to be done at home before class brought about several positive characteristics for us. For instance, as an EFL learner, I felt more responsibility for my learning and enjoyed learning without being dependent upon in-class instructions (F8).

Some students thirst for discovering some aspects of what they are learning on their own, instead of being passive knowledge receivers. The material used for FG in this study provided these kinds of students with such an opportunity:

I always enjoyed being familiar with different uses and combinations of words via searching different resources such as dictionaries or online materials. In traditional classrooms, we always had a shortage of time to cover all those aspects and I was not prompted to discover them, but this experience was a great opportunity to do what I always enjoyed in my learning practices (F1).

As the students were required to read the material and do the tasks, they were more prepared to participate in face-to-face classes, hence more engagement in the learning process was assured. F4's comment is revealing in this regard:

We had no choice except to receive the teacher's file and do what we were asked to At first, it was somehow cumbersome for me but as time went on I felt more prepared for taking part in class activities to which I was not so eager previously.

As the actual class time is limited to cover all that is needed for better learning and consolidation of the instructional materials, FC compensated for this problem to a great extent as also pointed to by F2:

The whole class time was devoted to doing the task by interacting with the teacher and our classmates. Previously, we lacked enough time to proceed based on our syllabus, but this instructional method compensated for this problem. Another good point was that we did not feel the passage of time.

As the students were asked to find different parts of speech, word combinations/collocations, and contextualize all of those in a text, they asserted gaining a deeper knowledge of the lexical items which assisted their long-term memory as well. For instance, F6 said:

According to a famous quotation from Franklin, when you are engaged in doing something, you will understand and learn it better... this was exactly what we experienced during the course, such that instead of rote memorization of the instructed words, we were able to manipulate a word in different ways meaningfully and for different purposes.

Along with the aforementioned pedagogical benefits, some social benefits were also perceived by the FG. Doing assignments in front of several peers can be frustrating for some students, especially those who are shy and apprehend explicit performance and those who cannot perform without prior preparation. Both points were stated by F5:

I always feel frustrated to take part in class interactions which causes my teachers to perceive me as an inactive person ... In fact, I am somehow an introverted person who does not prefer to express public comments. ... The preparation we were required to gain before classes, helped me overcome this characteristic, as I was sure that I have something to say.

The social interaction invoked by practicing what was learned in the form of groups was very appealing for those students who enjoyed doing activities via social interaction. F1 was a case in point:

I think group practicing was a strong point of this experience... because I was able to share what I knew with my peers and vice versa ... I learned a lot from my classmates because we all had practiced and were somehow sure of the points raised and the solutions provided.

Although these benefits and affordances experienced during the flipped classrooms were of great appeal to the participants, some negative points were also present as perceived by the same students which cannot be neglected. These challenges were either pedagogical or related to what was embedded in the flipped material. In terms of the pedagogical problems faced by the participants, F7 and F8 asserted preferring to listen to teachers' explanations and take notes for later recourse instead of looking for what was asked them, as they were not accustomed to such an instructional method.

I have been accustomed to listening to my teacher's voice in class while she is explaining the lesson points and taking notes to look them up later. So, this class format was not so appealing to me.

During the very first sessions, I was totally demotivated to continue the course, because this kind of classroom was totally bizarre for me.... But I gradually adapted myself to it and I found how it would be of aid to practice autonomous learning. I think it would not be so easy for somebody else to be positively adapted to new instructional situations.

Some other participants were complaining about the kind of group activities going on during in-class time, indeed they were susceptible about their classmates who would rather do the activities individually as expressed in the following extract by F1:

I prefer group or pair work instead of individual work, especially when doing instructional activities, but this was not the case with some classmates... They either did not want to share what they knew or were unable to do so ... I think this issue is related to their personality type.

F7 was more in favor of doing the assignments either in the classroom or after it, as she stated:

As I said, I learn more from teacher explanations instead of browsing different sources to find out what is there, ... You know, for me the teacher is the best source who triggers me to think and answer the questions or solve the posed problems ... in such [flipped] classrooms I lacked the teacher's prompt in a voice which caused some difficulties for me during the course... in other words, the classroom atmosphere propels me to think more.

Three members of the FG had problems that were related to the material used in the classroom. According to them, some other classmates had complaints about the same problems by and large. These problematic points are evident in the following extracts:

Sometimes I lost access to the internet and got frustrated about not being able to download the file shared by my teachers, thus being blamed for not sending the answers on time (F2).

I found this kind of assignment and class preparation time-consuming. We had to devote additional time to out-of-class activities both before and after the determined class time... I was totally busy with the course requirements (F4).

I think the PowerPoint file could be created more appealing. The audio pronunciation and the pictorial depiction of the word were also good ideas but additional materials can also be added.... I and two of my classmates usually watch English movies or animations and they have helped us a lot to improve our listening. ... I think inserting small instructional videos or animations can be very helpful for the learners.... As some students have a powerful photographic and acoustic memory (F7).

5. Discussion and conclusion

The aim of this study was to explore the impact of flipped classrooms on Iranian EFL learners' vocabulary improvement. A sequential mixed-methods study design was adopted to explore the issue the results of which will be reiterated here. The quantitative findings indicated that flipped vocabulary learning was beneficial for the experimental group as they performed better in the post-test, not only in comparison with their pre-test but also compared to the control group results. In addition, the control group did not perform significantly better in the post-test. Although these results differ from some published studies (Alhamami & Khan, 2019; Fraga & Harmon, 2014; Jalili et al., 2020; Mori et al., 2016; Oh, 2017), they are consistent with those of Fethi and Marshall (Fethi & Marshall, 2018), Han (2018), Kim (2018), Knežević et al. (2020), and Özkal (2019). Better achievement in flipped classrooms is due to the before-class preparation required of the students (Kim, 2018) and using online resources (McLaughlin & Rhoney, 2015). Besides, the interactive classroom atmosphere is a great aid for the students to master what has been encountered out-of-class (Zhang et al., 2016). The interactional patterns going on in face-to-face

classrooms were perceived by the participants to be useful and conducive to better learning. As stated by Kumaravadivelu (2008) interpersonal activities have the pedagogical benefit of more learner-learner interaction, as a social process which is deemed as important as cognitive ones in the route to successful L2 achievement.

With regard to the qualitative findings, it goes without saying that most of the students held positive attitudes toward the flipped classrooms which corroborates those of Kirmizi and Kömeç (2019), Moran (2014), Prefume (2015), Santikarn and Wichadee (2018), and Webb et al. (2014). The slides used in the flipped classrooms contained different input modalities including text, audio, and picture. Using visual input is a powerful way of gaining efficiency in language instructions (Özkal, 2019; Kang, 2015). The participants believed that they were more active and engaged in the class activities. According to Ahmed (2016) and Moran (2014), flipped classes foster learners' engagement and motivation to a great degree, however just flipping the classrooms does not and cannot guarantee more learner engagement (Moran, 2014).

In the post-method era, both learners and instructors are encouraged to follow some macro strategies (Kumaravadivelu, 2003) some of which were evident among this study's participants, for instance, the learners promoted their autonomy in vocabulary learning, contextualized the language input, and took part in negotiated interactions (Kumaravadivelu, 2008). In this case, both in-class and before-class activities resulted in such benefits, in other words, flipped classrooms by the use of technology are conducive to active learning, provide a social context for learning, and cause engaging learning materials to be accessed easily (Richards, 2015). In addition, interaction in the form of small groups in the in-class phase of the experimental group was another conducive factor to better learning and positive attitudes. Ellis (2008) asserted that group activities increase social interaction, enjoyment, motivation, learning, and independence more than teacher-centered classrooms.

Apart from these positive attitudes, some technological and material-related challenges were reported by the experimental group. Technological aspects such as system and internet characteristics are among the important factors to take into account during the implementation of any kind of learning which involves a connection to the web (Al-araibi, 2019; Kanwal & Rehman, 2017). The eagerness of this study's participants to include videos is an indication of the facilitative role of audio-visual material in improving vocabulary (Çakmak & Erçetin, 2018; Kaboocha & Elyas, 2018) and overall learning performance (Montero Perez, 2020; Ramezanali & Faez, 2019), however, the teachers' role in selecting the most pertinent audio-visual input to the learners' needs should not be neglected (Stempleski, 2002).

Overall, the results of this study showed the positive impact of flipped vocabulary learning among upper-intermediate EFL learners. Moreover, it was found that they held positive attitudes towards such an experience in terms of leading to more learning engagement, more interaction, better preparation, less frustration, and more efficient face-to-face classes. On the other hand, it was revealed that some learners are not already ready to accept the instructional mode as favorable and either prefer traditional classrooms or want their classes to be flipped via different material types. One of the limitations of this study is related to the kind of material used for the experimental group and the rather short span of time devoted to the treatment sessions. As suggested by the participants, the used material could be more influential if teacher-created or available instructional videos were also embedded in the slides. As this was the first time that these students experienced attending flipped classrooms, the trajectories of vocabulary development and their perceptions towards these classes could be traced more successfully if the treatment sessions would be held for more than one semester. Other data collection instruments could also add to the study findings by adding other variables to find relationships among them, for instance, the role of the students' learning and cognitive styles on their performance in flipped classrooms could be explored via surveys and classroom observations. The impact of gender differences on learners' performance and attitude can also be explored by comparing classes with different genders as it is one of the important biological variables affecting learning in general and language learning in particular. This study has valuable implications for those EFL teachers who want to introduce flipped classrooms to their students and e-content developers, as there are many factors to consider when preparing such materials including the students' needs, preferences, learning styles, etc.

6. Data availability

The data are available upon request with the corresponding author.

7. Conflicts of interests

The authors have no conflicts of interest to declare.

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9. Appendices

Appendix A

Screenshots of the slides for the FG



Please make sure to practice each part and think about the required parts in order to be prepared for class activities and discussions.

1.

Keen is an adjective

It has different meanings based on the context

Can you guess the meaning?

1. Keen

-Wanting to do something or wanting something to happen very much.

-A keen knife is very sharp.

✓ He told me that he was keen to help.

Can you think of any **synonyms/antonyms**? Write them.

Find out what **words and prepositions** combine with this word.

What are **other parts of speech**?



2.



Vacant

Adjective



Did you guess the meaning?

2. Vacant

- A vacant seat, building, room, etc. is empty and available for someone to use.
- ✓ Only a few apartments were still vacant.
- Any synonyms/antonyms? Write them.
- Find out what words and prepositions combine with this word.
- What are other parts of speech?



Appendix B

Interview guiding questions

1. Did you enjoy vocabulary learning via this method? Why and why not?
2. What do you think about the benefits of vocabulary learning using this method?
3. What do you think about the challenges of vocabulary learning using this method?
4. What are your suggestions for improving future courses instructed this way?

