

## Research Article

# An Investigation of Flipping an English Reading Course: Focus on Reading Gains and Anxiety

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The aim of this research was to explore the effect of flipped classroom on English as a Foreign Language (EFL) learners' reading skill and reading anxiety. For this purpose, a sample of 44 Iranian EFL learners was recruited and randomly assigned to a flipped group (N=23) and a non-flipped group (N=21). Using a quasi-experimental design, the researchers employed an experimental group that received flipped instruction and a control group that were instructed based on the regular method for a period of four months. The reading component of the Cambridge Preliminary English Test (CPET) and a scale of reading anxiety were given to assess the reading comprehension and reading anxiety of the participants as pre-test and post-test of the study. The outcomes of the research indicated that the learners in the flipped class substantially performed better than those of the non-flipped class regarding EFL reading gains. Also, flipping the course significantly reduced reading anxiety of the participants. According to these results, it may be concluded that EFL teachers can utilize flipped instruction for their reading courses.

## 1. Introduction

With the recent developments in technological devices, accompanied by rapid access to proliferating digital media coupled with online resources, computer-assisted language learning (CALL) has turned into a de facto teaching tool in educational arena (see [1]). The ubiquitous internet and an array of social tools have led to the ever-increasing popularity of technology integration as a global trend in education [2]. The last few years have witnessed the integration of computer-assisted instruction in delivering educational material and innovative approaches (e.g., [3, 4]).

Along with the advent of information and communication technology (ICT) tools and availability of online learning, research has shown that the implementation of ICT in English Language Teaching (ELT) through blended learning strategy has become widely recognized [5, 6]. The internet has created richer learning environments since it offers a considerable number of opportunities, which provide more adaptable learning programs for learners [2]. A plethora of researchers have tried to analyze the usefulness of e-

learning in teaching [7, 8] and students' academic performance [9]. As an example, Kong [10] argued that digital classroom helps learners to enhance their critical thinking abilities. According to Xu, Glick, Rodriguez, Cung, Li, and Warschauer [11], via a learning management system, e-learning can offer students with a better and thorough language learning experience. For example, CALL technologies offer a variety of tests and short quizzes based on students' proficiency level.

Previously, research has suggested that *flipped classroom* is a unique instructional approach [12] and active teaching approach [13], which can be conducted as an alternative pedagogical method to traditional instructional approaches. By drawing on the concept of flipped learning, the implicit technology employment for learning, outside-the-classroom instruction is emphasized [14]. Unlike conventional classroom, in which students acquire new knowledge through teachers' lecture inside the class and practice it via homework at home, in flipped classroom, class time is allocated to various higher-level learning activities, including problem-solving, group or class discussions in order to

practice the required skills [15]. In other words, as the name *flipping or inverting* suggests, flipped learning reverses events that take place inside and outside the classroom [16]. As Ozudogru and Aksu [17] mentioned, the role of classroom activities and homework has been inverted in flipped classrooms.

In the flipped approach, according to Milman [18], students review learning materials such as instructional videos, screencasts or vodcasts created by their teacher before coming to class. Later, during a class session, students practice the concepts at a deeper level through collaborative, problem-solving activities, and peer interaction sessions facilitated by their teacher. Students in the technology era, as Touchton [19] stated, are no longer passive learners who just acquire knowledge via listening to the teacher or reading books. Flipped classroom approach is an effective environment that allows students to engage in active learning [20]. Put differently, students have autonomous and flexible learning process in flipped classroom since they are able to control their learning pace [12, 21]. They can revisit past materials or pause and rewind the video lectures sent by the teacher at anyplace and anytime [22]. O'Flaherty and Phillips [23] have drawn our attention to the role of flipped classroom in promoting lifelong competencies, particularly for 21st century students. Bergmann and Sams [22], in addition, hold the view that flipped instruction gives learners further time to use English inside and out of the classroom due to its reverse learning process.

Delving deeper into the flipped learning, Mohamed and Lamia [3] pointed out its advantages which included increased interaction among the instructor and learners, more class time for solving problems and providing students feedback on their homework, knowledge sharing, flexible lesson syllabus, and more appealing short videos rather than long tedious lectures. Furthermore, use of flipped approach in language learning classrooms lowers the affective filters (e.g., anxiety) among L2 learners given that they decide when, where and how to see the instructional videos and the intended content at their own pace [24]. Having applied approach to a skill-based English instruction in Taiwan, Hung [24] maintained that the new approach is positively correlated with students' academic achievement and learning perceptions. Further research has shown that high school students' ICT significantly improved during the flipped English classroom intervention [25].

In the past few years, interest in flipped learning approach has proliferated in the educational domain in EFL context [26, 27]. In EFL contexts, a growing body of literature has scrutinized the utility of flipped instruction on different language abilities, including writing [12], speaking ([28, 29], listening [30], and reading [31].

In particular, several studies thus far have investigated the contribution of flipped learning to reading skill of EFL learners (e.g., [32]). Sage and Sele [33], for example, investigated the influence of flipped instruction on EFL students' reading performance through reflective journals. Findings indicated that the majority of learners took advantage of reading reflections because they had more preparation and engagement during the flipped intervention. It is a widely

held view that as long as technological environment is appropriate, learners' language comprehension and reading strategies would be effectively improved (e.g., [34]). In this line of inquiry, Dreyer and Nel's [35] study substantiated the positive effect of technology-based learning environment on reading comprehension among students who were studying English for professional purposes.

So far, most research on the flipped learning has mainly investigated whether or not flipped classroom result in students' achievement [36, 37]. Further efforts have been made to explore the usefulness of flipped instructional approach on L2 writing [12], speaking [38], and listening skills [39]; yet, L2 reading and reading anxiety among EFL learners have remained untouched by this line of inquiry. In spite of an emerging body of literature mainly concerned with flipped classroom techniques, meager attention has been given to the role of students' reading skill, especially in EFL context. To the researchers' best knowledge, no research has ever probed the impact of flipped classroom on EFL students' reading anxiety. Additionally, it is significant to know that no previous studies have investigated the effect of flipped classroom approach on both reading skills and reading anxiety of EFL students, particularly in Iranian context. As a result, much uncertainty exists in this line of inquiry. To address this lacuna, this research looks into the effect of the flipped model approach in an EFL reading course on reading achievement and reading anxiety. The following research questions guided this study:

- (1) Does flipped classroom significantly enhance Iranian EFL learners' L2 reading comprehension skills??
- (2) Does flipped classroom significantly reduce Iranian EFL learners' L2 reading anxiety?

## 2. Literature Review

The adaptability and availability of technology has enabled teachers to integrate technology into their curriculum and use digital devices for different purposes [40]. In parallel with infiltration of technology into educational context, a new pedagogical method, namely blended learning has emerged [41]. As an example, flipped classrooms entail a form of blended learning [42], in which traditional instruction is supplemented with online tasks and activities [43]. In other words, the instructor's lectures in class followed by homework at home in conventional teaching process is inverted in terms of order, and mostly accompanied by pedagogic films [44]. Although flipped and blended learning are related, they are different teaching approaches [45]. In blended learning, traditional educational activities are integrated with online instruction [46], while the inverted teaching process of flipped learning is related to the activity of providing learners with pre-determined materials outside of class and assigning class time to various collaborative tasks [47].

Technological innovation, along with the convenient access to wireless technology devices has led to a renewed interest in flipped learning/teaching approach [48, 49]. The

usefulness of flipped classroom in K–12, specifically in the mainstream education has been extensively investigated [22, 50]. By definition, in the flipped classroom approach, input materials, such as lectures recorded by the instructor are sent to the learners before the class while the class time is allocated to cooperative tasks and interactions [22]. Simply put, in flipped classrooms, teachers convert conventional face-to-face lectures into pedagogic videos with the purpose of freeing up class time for collaborative tasks and feedback, interactions, and students' inquiries regarding the lesson [51]. Teachers in conventional classroom start with the input phase (e.g., lectures), whereas the starting point is output in flipped classroom [52]. From Bishop and Verleger's [53] perspective, flipping the classroom is a novel instructional mode, which is grounded in engaging teaching, inquiry-based learning, and problem-based learning. In this type of instruction, as Sohrabi and Iraj [54] noted, learners are required to get involved in meaningful instructional tasks.

In the university classes, for example, students are asked to read a novel by themselves at home rather than going over the plot in class. Because University instructors intend to allocate class time to explore symbolism or draw out themes of the novel. Students can work on their problems in groups, where the instructor can easily monitor and correct their mistakes and misunderstandings before struggling with a new concept [20]. Therefore, it may be argued that teachers and learners can use the class time more effectively in flipped classrooms. In comparison with traditional classrooms, in which students passively listen to their teacher's lecture in class, they play an active role in flipped learning classrooms [55] as they are engaged in numerous inside-the-class tasks. Flipped teaching is regarded as a learner-centered technique because it has the potential to pave the way to autonomous learning and create more opportunities for students to access meaning-focused input with the assistance of technology [56]. The purpose of flipped classroom is to keep aloof from teacher-centered and traditional lecture-oriented classroom which may pose a boring and monotonous learning experience for students [57].

In recent decades, the flipped instructional method has gained momentum in EFL context [58, 59], mainly because of its potential for inverting the conventional instruction procedures [16]. Unlike the ESL context, students only use English in the traditional EFL classrooms and rarely get the chance to use English beyond the classroom walls [60]. This seems to be true in Iran, where the present study was conducted. In addition to limited practice time in class, there are few opportunities for EFL students in Iran to employ English in real contexts. But through flipped classroom, learners are given more time to use English inside and outside the class [12]. As an example of investigations in this area, Lee and Wallace's [60] study has offered some important insights into the field of EFL teaching. Their study was carried out as an attempt to compare flipped classroom with non-flipped one. Findings indicated the majority of learners in the flipped group enjoyed learning English. Moreover, these learners reported more learning engagement and better learning outcomes.

Flipped learning formed the central focus of a recent study by Challob [61] who revealed significant results. The relevant data were gathered via administering pre-and post-study writing assignments, post-study interviews, observation, and diaries. Findings of this study demonstrated that learners' writing skill, motivation, and autonomy were positively influenced in flipped learning environment. It was also revealed that teacher and peers' feedback, time and place flexibility, and interactive feature of the flipped context were identified as factors that had effect on enhancing learners' motivation, writing skill, and autonomous learning.

In spite of the fact that there has been much argument on how flipped instructional approach influence learners' different skills, few studies have been able to draw on any empirical research into the effect of flipped learning on reading comprehension in the domain of EFL (e.g., [62]). These studies have been mainly concerned with the effect of flipped learning on students' writing [61], listening [63], and speaking performance [29]. The findings of these studies appear to demonstrate that flipped classroom can help students to improve their English skills and achieve better learning outcomes.

One example of such investigations is Amiryousefi [64] work which pondered the effect of flipped learning on L2 listening and speaking skill of EFL students in the context of Iran. The students were divided into three groups: a) conventional learning, b) structured flipped learning, in which the teacher was in charge of selecting materials, while in c) semi-structured flipped learning students chose the materials in cooperation with each other. Findings of this study revealed that flipped learning had a significant role in improving the participants' speaking and listening skills and their engagement in out-of-class activities.

In another study Bezzazi [65] investigated the effect of flipped learning on EFL students' public speaking. Comparing two groups of flipped learning and conventional indicated that students in flipped learning had better performances in terms of body language, paralinguistic, content and organization.

It is commonly agreed that flipped classroom method can be appropriately used to improve EFL students' reading skill (e.g., [25]). Huang and Hong's [25] study was an effort to explore the effect of flipped learning on Taiwanese EFL learners' English reading comprehension. The participants of their study were 77 10th grade high school students whom were assigned to an experimental group (flipped English classroom intervention) and a comparison group (regular English classroom). The results confirmed that flipped classroom intervention promoted reading comprehension and ICT skill significantly and quickly in experimental group.

Conducting a similar study in EFL setting, Samiei and Ebadi [32] surveyed the usefulness of WebQuest-based flipped teaching on the inferential reading comprehension skills of EFL students in the context of Iran. To this end, they carried out a mixed-method research design among a group of Iranian EFL learners participating in an IELTS course. Findings highlighted the effectiveness of WebQuest-based

flipped teaching in developing the participants' reading abilities. In addition, the outcomes of semi-structured interviews demonstrated that students held positive perceptions towards the innovative approach of flipped instruction in their reading comprehension skills.

In conventional classrooms, according to Hwang, Chen, Sung, and Lin, [66], teaching reading is both time-consuming and difficult because it requires training students in different reading skills, including recognizing new vocabularies, determining main ideas, explaining the reasons, along with contrasting, comparing, and arranging readings. Therefore, flipped classroom approach can be considered an alternative for traditional classrooms since it gives students more opportunities to practice and discuss with their classmates and teachers to solve their problems regarding reading [25]. As Amiryousefi [64] noted, students' engagement and learning outcome increases when they are assigned further agency in selecting class content and materials.

Anderson [67] stated that reading comprehension is an integral skill for learners to have a good command of a second or FL. Reading comprehension requires students' ability in recognizing new words, processing different structures to build comprehension, engaging various strategic processes as well as underlying cognitive skills [68]. However, some learners have difficulty in concentration, remembering the ideas, and learning anything new, as a result, these problems lead them to anxiety [69].

In their seminal study, Saito, Garza, and Horwitz [70] maintained that students experience reading anxiety when they encounter a) unfamiliar cultural material and b) unfamiliar scripts and writing systems. They argued that the readers struggle with high anxiety when they attempt to decode the script. During the reading process, learners would first face different FL symbols, decode them into sounds, associate different sounds with words, and lastly, try to process the meaning of a passage. The readers immediately experience anxiety when they have difficulty in processing the FL passage owing to their inadequate knowledge regarding the cultural materials underlying the passage.

Satio et al. [70] revealed that FL reading anxiety varies by target language. According to the results of their study, English-speaking students of Japanese were recognized as the most anxious while reading, whereas students of Russian showed the least amount of anxiety in reading. They also attempt to compare levels of general anxiety and FL reading anxiety among learners of foreign languages (Spanish, Russian, & Japanese). For data collection, they employed a self-report measure of reading anxiety developed by Saito et al. [70] and the general Foreign Language Classroom Anxiety Scale developed by Horwitz, Horwitz, and Cope [71]. Findings showed that participants felt less amount of reading anxiety than general anxiety.

Research has acknowledged that L2 reading anxiety negatively influences reading performance [70, 72]. Shi and Liu's [72] study, for instance, indicated that Chinese college students susceptible to high degrees of reading anxiety reported lower scores in their reading performance tests. It

is also believed that L2 anxiety is partially pertinent but different from general L2 anxiety (e.g., [73]).

Much of the current literature on reading anxiety has paid particular attention to the source of FL reading anxiety [74, 75] and its predictive power on FL reading performance [76]. As an attempt to investigate FL reading anxiety, Zhao [77] conducted a study among English-speaking students of Chinese as FL. Findings revealed that L2 reading anxiety was inversely correlated with FL reading performance. Moreover, the participants experienced identical degrees of FL reading anxiety and general FL general anxiety. In regard to the main sources of FL reading anxiety, unknown topics, unknown scripts and apprehension towards the reading impact were highlighted.

Recently, flipped instructional approach has been in the limelight in different contexts [48]. A number of researchers have gone to center their attention on the effect of the flipped approach on listening, speaking, and writing skills [12, 38, 39]. Although the effectiveness of flipped instruction has been acknowledged by numerous researchers [12, 22, 61], very little empirical evidence is found in the literature about whether it can develop EFL students' reading skills. Furthermore, no studies have so far investigated the impact of flipped learning on reading skills and reading anxiety among EFL students, particularly in Iranian context.

### 3. Method

*3.1. Participants.* The research objectives were examined by recruiting the total number of 44 Iranian EFL students as the participants in this research. These participants were, in fact, learners from two intact classes in a private language institute in Tehran, Iran. All the participants were female students with their age ranging from 17 to 23 with the mean age of 21.63. One of the classes was randomly assigned to a flipped group (N=23) and the other class was assigned to a non-flipped group (N=21). The course was a supplementary course designed to enhance reading skills of the intermediate EFL learners. Since overall English proficiency affects reading comprehension of the participants, the homogeneity of the two classes regarding general English proficiency was checked by administering "Oxford Quick Placement Test" (Allan, 2004).

#### 3.2. Instruments

*3.2.1. English Placement Test.* In order to assess the global English proficiency of participants, a valid version of QPT [78] was utilized. This version of QPT contains 60 multiple-choice item assessing students' knowledge of grammar and vocabulary. This test has been widely used and is considered as a reliable and valid proficiency test particularly for intermediate learners. The reliability coefficient of this test was 0.86 in this study, as calculated with KR-21 formula.

*(1) Reading Comprehension Test.* The reading gains of participants were measured through two parallel versions of the reading component of the Cambridge Preliminary English Test 4 (CPET), one before (as pre-test) and one at

the end of the treatment (as post-test). The reading section of CPET measures reading skills of the intermediate level (B1) EFL learners. It includes five sub-sections with 35 questions. The internal consistency of CPET as estimated by KR-21 formula for the pre- and post-tests was 0.79 and 0.82, respectively.

(2) *Reading Anxiety Scale*. The reading anxiety of participants was assessed through administering the Foreign Language Reading Anxiety Scale (FLRAS) which was designed and validated by Saito et al. [70]. This self-report measure includes 20 items which evaluate respondent's apprehension while doing L2 reading tasks. Each item is measured on a 5-point Likert scale varying from 1 (*strongly disagree*) to 5 (*strongly agree*). The internal consistency of FLRAS as measured by Cronbach's alpha formula was reported to be 0.83 in this study.

**3.3. Data Collection Procedure.** After the students were randomly assigned to the flipped and non-flipped groups, the experiment began. The participants were notified of the purpose of the study and were assured that the gathered data would remain confidential. Concerning the pre-tests of the study, the reading pre-test and reading anxiety questionnaire were given to the participants during the first session. The experiments lasted for about 14 weeks.

As for the instruction of the flipped group, the e-learning (electronic version) materials were used for each session while the printed version of materials was employed for the conventional non-flipped group. Nevertheless, the same reading passages were chosen for the instruction of both classes. The only difference was that the flipped group was provided with electronic materials before attending the class.

The instructional procedure used for the flipped group was carried out using the presentation of the instructional resources and tasks, pre-prepared instructional videos, voice annotated PowerPoints, and supplementary electronic devices. The flipped group participants were also exposed to links to useful websites about the instructional contents prior to coming to the class. Telegram and WhatsApp were employed for providing the participants of the flipped classroom with the course materials. Consequently, the flipped group participants were given this opportunity to get exposed to the materials and contents prior to coming to the class. This opportunity gave the students greater free time to collaborate with their classmates in the learning process and enhance their reading competencies. These students were also provided with the audio file of the texts before the class via Telegram or WhatsApp applications.

As a portion of the classroom participation grades of the course, the participants of the flipped group were required to go through each passage before the class time. Additionally, they were encouraged to listen to the audio files of the passages several times at home. During the class time of the flipped instruction, the instructor asked question regarding the passages to assure that the students had covered the content of the instruction before attending the class. For instance, he requested some learners to mention the summary or main idea of the given texts. In the next step, the

students got involved in group discussion and did the exercises collaboratively. More particularly, the participants were asked to brainstorm, locate the main idea, answer the questions, and paraphrase or reproduce some parts in groups. Then the teacher explained the new or difficult points in the videos or PowerPoints. At the end of the class, he also provided the learners with the summary of the texts and issues raised in each session.

In contrast, the learners of the non-flipped group were instructed based on the conventional instruction in which all the teaching occurred inside the class. Prior to going through each passage, the instructor activated learners' background knowledge of the passage by asking them some questions or encouraging them to have brainstorming. After teaching each passage, the learners were asked to respond the questions pertaining to the passage. In this conventional, non-flipped procedure, only the printed format of reading passages was used and no types of electronic materials were given to the students. The procedure lasted for the whole period of 14 weeks. At the end of the experiment (week 14), participants' reading comprehension and their level of reading anxiety was measured via giving the posttests.

**3.4. Data Analysis.** As for the data analysis and to explore the impact of the flipped classroom on the reading comprehension and reading anxiety of students, two one-way between-groups analyses of covariance (ANCOVA) were performed to compare the usefulness of the two types of treatment (i.e., flipped versus non-flipped) on the two dependent variables (i.e., reading comprehension and reading anxiety). For the performed ANCOVAs, the type of instruction was the independent variable, and the scores on the post-tests were the dependent variables. The scores on the pretests were regarded as the covariate. As a pre-requisite step, preliminary checks were conducted to make sure that all the assumptions of running ANCOVA were met.

## 4. Results

First, an independent-samples t-test was run to examine the QPT scores for the flipped and non-flipped groups. As observed in Table 1, the results demonstrated that no statistically substantial difference was found in the QPT scores for the flipped group ( $M=47.38$ ,  $SD=12.01$ ) and the non-flipped group ( $M=48.89$ ,  $SD=12.69$ );  $t(42) = -.697$ ,  $p > 0.05$ , verifying the fact that the both flipped and non-flipped groups were not heterogeneous concerning general English proficiency.

Then, descriptive statistics were computed for the variables under investigation. As presented in Table 2, the mean score of reading comprehension for the flipped group was 18.04 on the pretest and it increased to 25.52 on the post-test. By the same token, the mean score of reading comprehension on the pre-test for the non-flipped group was 17.14, which increased to 21.00 on the post-test. As a result, it appears that both kinds of instruction have been effective in enhancing reading skill of the EFL participants.

However, ANCOVA was run after adjusting for the pre-test scores of reading comprehension. The results showed

TABLE 1: Results of the QPT.

Groups	M (SD)	T	Sig.
Flipped	47.38 (12.01)	-.697	.594
Non-flipped	48.89 (12.69)		

TABLE 2: Descriptive Statistics.

Groups	Scales	Pretest		Posttest	
		M	SD	M	SD
Flipped	Reading	18.04	5.12	25.52	5.63
	Anxiety	54.69	12.49	41.17	12.91
Non-flipped	Reading	17.14	4.72	21.00	5.39
	Anxiety	50.42	11.09	49.19	11.80

that there was a substantial difference between the flipped and non-flipped groups on the post-test scores of reading comprehension,  $F_{(1, 41)}=12.69$ ,  $p \leq 0.001$ , partial eta squared=0.236) (see Table 3). These results corroborate the fact that the students in the flipped class enhanced their L2 reading substantially more than the students in the non-flipped group, revealing that flipped classroom was useful in enhancing the reading gains of the EFL learners.

Concerning the second research question and the impact of the flipped instruction on the reading anxiety of EFL learners, the descriptive statistics (see Table 2) illustrates that the mean score of the flipped group for reading anxiety was 54.69 in the pretest and it was reduced to 41.17 on the post-test. Also, the reading anxiety mean score for the non-flipped group was 50.42 on the pre-test and it was slightly decreased to 49.19 on the post-test. However, upon adjusting for the pre-test scores of reading anxiety, the results of ANCOVA (see Table 4) revealed that a statistically significant difference was found between the two groups on post-test scores of reading anxiety,  $F_{(1, 41)}=64.55$ ,  $p \leq 0.001$ , partial eta squared=0.612). Based on this finding, it may be concluded that flipped classroom significantly contributed to reducing reading anxiety of EFL students in this study.

## 5. Discussion and Conclusion

As previously discussed, there seems to be a paucity of empirical research on the impact of the flipped instructional mode on reading skills. Against this backdrop, the main purpose of the current study was to throw more light on the role of flipped instructional approach in learning performance, specifically L2 reading. This study was set to explore the impact of flipped learning on reading skill and reading anxiety of a sample of Iranian EFL students. The results of this research showed that the participants in the experimental group (flipped classroom) reported higher levels of L2 reading achievement in comparison with learners in the non-flipped group (conventional classroom approach). The role of flipped classroom in improving students' reading skill is clearly supported by the current findings of other studies (e.g., [32, 79]), which indicated its effectiveness in promoting students' reading comprehension. In accordance with the present result, Samiei and Ebadi's [32] study revealed that

TABLE 3: The Results of ANCOVA on Reading Skill.

Source	Type III sum of squares	Df	Mean square	F	Sig.	Partial eta squared
Covariate (pretest)	785.194	1	785.194	67.273	.000	.621
Between-subjects	148.220	1	148.220	12.699	.001	.236
Within-subjects	478.545	41	11.672			

flipping a reading course improved EFL students' inferential competencies in reading skill. The results of the interviews with the learners highlighted learners' positive attitudes towards flipped classroom as an effective approach in inferential reading comprehension skills. It was also revealed that WebQuest-based flipped classroom improved students' critical thinking and cognitive ability.

The finding of the present study is partially in line with previous conducted empirical studies [80, 81]. Parallel with such results, for instance, Yulian [81] showed that flipped classroom enhanced EFL learners' critical thinking for critical reading. In a similar vein, Fulgueras and Bautista [80] asserted that the learners in the flipped group significantly had better performance than those in the conventional group concerning reading comprehension and critical thinking.

One possible explanation for these findings might be that as the materials were sent to the students beforehand, they had adequate time to read the required passage several times and listen to the audio text to ponder over the main idea and analyze it. They could watch the instructional videos sent by the teacher anywhere and anytime at their own speed in case they had difficulty in understanding a sentence [82]. As a result, class time was devoted to collaborative activities (e.g., brainstorming, paraphrasing, questions and answers), group discussions, and teacher's information elicitation. Therefore, there were more opportunities for further inquiry and problem solving activities with regard to a particular topic, accompanied by peer- and teacher interaction. Given that the participants in the flipped group had access to reading materials before the class, they had more learning autonomy [12]. This is confirmed by Challob [61], who argued that students become autonomous learners in flipped environment.

However, to practice reading in traditional classrooms, students are asked to read the passages in their course books out loud for the whole class. In fact, this method helps students to make the connection between sound and spelling and read correctly with the help of teacher correcting their mispronunciations on the spot rather than understanding the meaning or message that the text conveys (Doff, 1988). When reading the text aloud, the reader's attention is focused on pronouncing the words correctly rather than getting general understanding of the text. Sometimes, teachers would rather read the text themselves because it gives them more control over the activity; but they cannot be sure that all the students are following the text at their teacher's speed.

TABLE 4: The Results of ANCOVA on Reading Anxiety.

Source	Type III sum of squares	Df	Mean square	F	Sig.	Partial eta squared
Covariate (pretest)	5467.092	1	5467.092	226.084	.000	.846
Between-subjects	1561.045	1	1561.045	64.555	.000	.612
Within-subjects	991.451	41	24.182			

Moreover, there are no interactive activities and group discussions about the passage due to limited time [83]. This seems valid in a crowded class in which class time is devoted to students reading the text aloud without having interaction and practice with their peers owing to inadequate time. This interpretation refers to idea that the students engage with the course content through an active student-centered learning in flipped classroom, where they get more constructive feedback from their teachers [3]. Therefore, more practice of new concepts, along with teachers' support and feedback leads students to have a better reading performance.

Finally, the results of this study verified the effectiveness of flipped classroom approach in reducing the reading anxiety levels of EFL students in the experimental group. In light of justifying this finding, three possible explanation seem true. First, students become more confident in reading skill when they perform better in terms of L2 reading achievement in the flipped classroom. Consequently, students with high levels of confidence experience less anxiety [84]. It can be inferred that students' better L2 reading performance is accompanied by positive changes in emotion (e.g., more confidence & less anxiety). Second, the reversed nature of the flipped classroom allows the participants in the experimental group watch various instructional videos that demonstrate the correct ways of using reading strategies and comprehending the text at home. This approach provides learners the definitions of grammar and vocabulary (e.g., chunks, phrasal verbs, & idioms) used in the text available online. Therefore, this can be considered as an advantage over traditional L2 reading instruction as teachers cannot explain different structures from the text owing to constraints of time. In addition, this approach frees up teaching time, letting teachers work on students' weakness, ask comprehension questions via collaborative and interactive activities, and give them immediate feedback in class [26]. Therefore, it can be argued that students are less anxious when they are engaged in activities rather than listening to their teachers' lecture passively. This is partially in agreement with [85], who believed that further practice and students' classroom engagement in class help them to have a better reading performance [86].

Lastly, group learning might reduce students' reading anxiety level as they are engaged in different cooperative activities and group discussions. As mentioned earlier, students are divided into groups to complete assignments in flipped classroom and since they share their thoughts and responsibilities with other group members, they may struggle with lower levels of anxiety. Whereas, in traditional classes they may be afraid of making mistakes and their peers' negative evaluations during individual activities [71]. This

is partially supported by [87], who argued that being part of a group in flipped classroom helped pre-service teachers reduce their anxiety and gain confidence in themselves.

Taken together, the findings of this study evinced that the learners in the flipped group substantially performed better than those in the non-flipped group with regard to L2 achievement, suggesting that the flipped instructional approach was influential in improving L2 reading skills of Iranian EFL learners. It was also revealed that flipped reading instruction significantly reduced students' reading anxiety. The combination of these results lends support for the conceptual premise that when L2 reading achievement increases, the reading anxiety reduces among students in flipped classroom.

In a nut shell, due to its inverted teaching process, flipped instruction can expand the knowledge of students beyond the classroom wall and provide them with various interactive collaborative, and cooperative activities. As a result, flipped instruction can be an appropriate alternative approach for conventional approach to improve students' L2 reading skill and reduce their reading anxiety. Nonetheless, less attention has been directed to this research domain. Accordingly, the results obtained from this study can enrich current literature on flipped learning since this approach is still in its infancy.

As far as pedagogical implications of this study are concerned, EFL teachers are recommended to take the initiatives to integrate flipped instructional approach into their regular classrooms, particularly in reading instruction. Since EFL instructors in Iranian context have lack of adequate time to work on skills separately, flipped approach allows them save more in-class instructional time for solving students' problems. In addition, unlike traditional classroom in which some time of class is devoted to the evaluation of the learners' assignments, students will get the opportunity to have more practice and receive teacher-and peer-feedbacks with regard to reading skill. Nonetheless, it is worth mentioning that the implementation of flipped instruction will not ensure effective reading outcomes as the major responsibility (e.g., creating instructional videos or podcasts, preparing quizzes and questions for in-class activities) is on teachers' shoulders [88]. Furthermore, the EFL instructors should be trained on how to use flipped method for teaching reading skills.

There are some limitations to the findings of the current study. As this study used a small sample size, the findings must be interpreted with caution because the results might not be transferable to other populations. A larger sample from different cities would enable researchers to provide a more comprehensive understanding of the flipped reading approach in the Iranian context. The current study only

explored the effect of the flipped instructional approach on reading achievement and reading anxiety. It would be also interesting to assess the effects of flipped classroom on students' reading motivation, self-efficacy, and reading burn-out. As the nature of this study was quantitative, there is a definite need for qualitative research design (e.g., semi-structured interviews & classroom observation) to propose more conclusive and accurate findings. Moreover, this research has thrown up some questions in need of further exploration. One question that needs to be asked, is how flipped classroom approach reduces students' reading anxiety. To the best of researchers' knowledge, FL reading anxiety is a salient problem to Iranian learners of English given the different writing systems the two languages use, they need different word recognition skills. Research into the sources which help students decrease their reading anxiety level in flipped classroom can be a novel topic for future studies.

### Data Availability

The data that support the findings of this study are available on request from the corresponding author.

### Conflicts of Interest

The author(s) declare(s) that they have no conflicts of interest.

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