An account of EFL learners’ listening comprehension and critical thinking in the flipped classroom model

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Abstract: The present research aimed to seek the effects of flipped classrooms on improving Iranian EFL learners' listening comprehension. To this aim, 40 intermediate students were chosen based on an Oxford Quick Placement Test (OQPT) and they were assigned to a flipped classroom (experimental group) and at traditional classroom (control group). After running a pretest of listening comprehension, the listening materials were presented to the participants in the flipped classroom through the Internet and computer, while the participants in the control group were deprived of the mentioned facilities. At the end of the treatment which lasted for 10 sessions, 50 minutes each session, a listening comprehension test was administered as posttest. In addition, an interview was administered among the participants in the experimental group. The results revealed significant differences in learning English listening comprehension and critical thinking between both groups in favor of the experimental group. The study recommended the necessity of implementing flipped classroom in teaching and learning English listening comprehension to bring about better outcomes in students’ achievement. Flipped learning requires L2 learners to be autonomous at home and collaborate in class.
1. Introduction

The flipped classroom is a modern technique in instruction, but it is not a totally original thought. Instructors frequently dole out reading to be done at home, and after that, anticipate that learners should discuss about the reading in class. This plan is referred to as an inverted classroom by Mok (2014). According to Rutkowski (2014), in the flipped homeroom learners watch video-recorded addresses outside of class, in this manner they expand time for dynamic learning and practice to happen in class. While execution of this technique may appear to be marginally unique for every instructor, basically “the flipped section of the flipped classroom implies learners watch or listen to exercises at home and accomplish their homework in class” (Yelamarthi et al., 2015, p. 28).

As flipped models have turned out to be progressively common in the instructional literature and extensively executed by various researchers in recent years (Moranski & Kim, 2016), the need to explore the impacts of flipped models on language learning is fundamentally significant (Hashemifardnia et al., 2018). The flipped model classroom is an educational technique that inverts the process of conventional classroom by presenting the educational substances normally online involving the students in cooperative group learning or potentially basic critical thinking exercises that are completed under the educator’s direction amid class (Herreid & Schiller, 2013; Namaziandost & Çakmak, 2020).

Flipped classroom are accepted to be helpful for educating and learning. Some educational advantages of the flipped classroom were specified by various specialists. These advantages incorporate (1) learners’ and teachers’ certain impression of the dynamic learning condition (e.g., Abedi et al., 2019; Butt, 2014; Gilboy et al., 2015), (2) progressively dynamic involvement amid the class (e.g., Lee et al., 2017), and (3) excellent success and attainment on developmental/summative evaluations (e.g., Nat, 2015). For instance, when Love et al. (2014) executed a flipped linear algebra course, most of the learners announced that the methodology helped them build up a more profound comprehension of the substance. Lo and Hew (2017) divulged that learners in a flipped classroom model performed outstandingly superior than learners in the traditional classroom structure on homework and tests.

The instructive significance of the flipped homeroom is propped up by a scope of learner-focused learning hypotheses in the domain of educational psychology (O’Flaherty & Phillips, 2015), including helpful learning (Namaziandost, Neisi, Moomtaz et al., 2019; Slavin, 1991), cooperative learning (Namaziandost, Homayouni et al., 2020; Nat, 2015), peer mentoring (Karabulut-Ilgu et al., 2017; Namaziandost, Sawalmeh et al., 2020), peer-assisted learning (Lee et al., 2017), problem-based learning (Stannard, 2012), and dynamic learning (Smith & McDonald, 2013).

As of late, the expansion of instructive innovation has permitted flipped homerooms to be effectively and easily adopted in advanced education settings (Slomanson, 2014). This learning condition can be portrayed as learner-focused-learners that are required to come to class having just picked up the information important to effectively take part in critical thinking exercises with their companions. Throughout the cycle of teaching, they keep up a dynamic contribution at the heart of learning. The training depends on the hypothesis that meaningful interaction among companions patronizes learning building and that educators can give extensive auspicious and customized guidance and criticism amid in-class exercises (Kim et al., 2017; Namaziandost, Rezvani et al., 2020). As this study dealt with the effect of flipped classroom procedures on improving EFL learners’ listening comprehension as well as their level of critical thinking, the following section is devoted to a brief explanation on critical thinking.
When the concept of critical thinking is considered, it is seen that it emerged about 2000 years ago by Socrates’s search for the truth. The transfer of Socrates’ discourses by Plato and Aristotle contributed to the development of today’s critical thinking system. When the dialogues conveyed by Plato are examined, it is seen that the validity, source and validity of the information are discussed in the conversation process (Thayer-Bacon, 2000). In addition to the many recognitions made in the following years, John Dewey defined modern thinking in critical thinking. In his definition of reflective thinking, Dewey defines critical thinking as in the light of active, persistent, opposing views or supporting evidence, and identifies the development of careful thinking, without the prejudice of belief or knowledge (Fisher, 2001).

According to Rudd (2007), critical thinking is a unique way of thinking. An individual who has systematic thinking and habit, intellectual lowbrow, empathy, open-mindedness, and courage, examines the facts in intellectual integrity. To put intellectual standards or criteria in the thought e.g., to define the reasons for the criteria, to give the idea to success or to the evaluation step, to specify precise, accurate, relevant, deep, meticulous, adequate, open standards. To support the structuring of thinking, to be aware of the components of rational thinking, to transform any component into a disciplined process, to bring standards to thinking, to evaluate the process by the continuous review, to use criteria for this purpose are the things to decide on the effectiveness thinking.

It is a fact that critical thinking has been acknowledged as a significant part of all fields of education for many years. Although teaching critical thinking is still not clear (Atkinson, 1997; Rfaner, 2006; Wallace, 2003), Wallace (2003) claims that successful teaching of critical thinking can be achieved only when the teachers understand the concept of critical thinking. Therefore, it is inarguably suggested to form the concept of critical thinking. In other words, Ennis (1991) revised his explanation of critical thinking to mean “reasonable contemplative rational that is concentrated upon determining what to rely on or not”.

There are some definitions of critical thinking. Some believe that critical thinking is a broad construct (Davidson & Dunham, 1997) which focuses mainly on reasonable thinking which focuses on what to believe or do, while some others consider it more narrowly which is specific to a certain content area (McPeck, 1981; Namaziandost, Hosseini et al., 2020). According to Halvorsen (2005), critical thinking is not easy to define, since it may mean different things to various people in different contexts. Nevertheless, instructors can incorporate some of its key elements in their classrooms. He defines critical thinking as: “to think critically about an issue is to consider that issue from various perspectives, to look at and challenge any possible assumptions that may underlie the issue and to explore its possible alternative” (p. 1).

Wright (2002) tried to present a suitable definition by means of clarifying the concept of critical thinking and determining what problem the definition should help to solve. For the purpose of teaching, for example, the definition should help the teachers teach and assess critical thinking in school classrooms. Thus, the definition is intended to “preserve the core meaning of the original concepts used to define critical thinking” (p. 41).

Critical thinking includes the ability to analyze and evaluate one’s own thinking processes. Huff (2000) emphasized that good critical thinking is not an innate or natural ability for most L2 students but that they can be taught through effective pedagogical methods to learn to think critically. L2 Students need the ability to question and find alternatives to evaluate their own values and belief systems (Huff, 2000, as cited in Anderson-Meger, 2011; Namaziandost, Neisi, Kheryadi et al., 2019).

Critical thinking is considered to be the ability to engage in purposeful judgment (Facione, 1992 as cited in Abrami et al., 2008). Ideal critical thinkers are informed, open minded, fair, realistic about bias, and careful in making judgments (Abrami et al., 2008; Namaziandost, Hashemifardnia et al., 2019).
Critical thinking deals with specific skills compared with psychological attributes. Critical thinking skills can be transferable across contexts although there is debate on how to teach skills—generalist or specialist perspective (Abrami et al., 2008, as cited in Anderson-Meger, 2011). There is much controversy about whether it is possible to include critical thinking strategies in education or not, and whether critical thinking can be taught or not. However, in spite of all these controversial ideas and beliefs on teaching critical thinking skills, everyone agrees that thinking critically is the major goal of education (Anderson-Meger, 2011; Namazi, Nasri et al., 2019). It seems that critical thinking can affect and be affected by other factors involved in the process of teaching and learning.

In the current study, the impact of flipped classrooms on EFL learners’ listening comprehension is inspected. Listening is the first language skill which children acquire. It creates a base for all components of language and cognitive improvement, and it plays a lengthy role in learning and communication processes (Smith & McDonald, 2013). Overmyer stated that “Listening as the Cinderella skill in second language learning has been neglected by its elder sister—speaking” (Smith, 2012, p. 12).

According to Rost (1992), “listening is crucial in the language classroom since it equips the learner with excessive inputs. Without comprehending input at the right level, any learning easily cannot start. Therefore, listening is vital to speaking” (p. 141). Rivers (1981) additionally supports the significance and valence of listening and claims that “speaking does not lonely make communication unless what is said is understood by another person” (p. 151). Iranian English classes are teacher-centered. Besides, the required facilities including Internet, computer and projectors are not available in these classes. Mostly, teachers carry the burden of teaching. Students’ cooperation is limited. So, the current research tried to cover these issues, hoping it would be a step to enhance Iranian EFL learners’ learning. Flipped classroom is a kind of opportunity that engages students in their process of learning. Flipped classrooms can involve students more in leaning process in comparison to the traditional classrooms.

The other problem relates to the listening. In spite of its importance, listening comprehension is still treated as a Cinderella skill in language institutes and high schools of Iran, and English language teachers stress other skills at the expense of listening skill as Chastain (1988) says “both language teachers and students tend to overlook the importance of listening comprehension skills since their attention is fixed so completely on their ultimate goal, speaking that they fail to recognize the need for developing speaking skills” (p. 192).

The significance of this study lies in the fact that it can increase the cooperation among L2 students. As Thakur (2015) believes flipped classrooms permit class time be utilized to overcome skills through cooperative talks. This urges L2 learners to teach and learn the content from each other with the help of their teachers.

2. Review of the literature
Some studies have so far been carried out on flip classroom to check and investigate its impacts. The studies have come to findings for and against this type of classroom handling. Some studies in this field have proved the positive impact of this type of classroom. As a case in this point, Yoshida (2016) investigated Japanese university students’ perceived usefulness of flipped learning for elementary and secondary education. A self-report questionnaire sheet was utilized in which 66 Japanese third-year university learners had been asked what they found beneficial about flipped learning. The findings showed that from the participants’ point of view, flipped learning is useful because the video helps learners study the teaching materials over and over. In addition, flipped learning improved learners’ understanding of the educational materials, and they could study at their pace and on their free time.

Similarly, Szparagowski’s (2014) study investigated the flipped or modified classroom and its consequences for student learning. The required data were gathered from students’ reviews, a pre
and post overview, a class talk with/exchange, and the researcher’s close to home notes from instructing. The outcomes showed that some potential benefits of the flipped classroom make it a type of training that instructors should not neglect.

In the same vein, the impact of the flipped classroom on students’ improvement and stress was examined by Marlowe (2012). The findings indicated lower stress levels among participants in this kind of classroom environment compared to other types of classes. In general, students showed positive feelings towards the treatment and enjoyed the associated advantages of being able to select their own homework assignments and discover concepts they found fascinating extremely in-depth.

On the other hand, some studies have shown negative outcomes for flipped classroom. For instance, G. Overmyer (2014) investigated the effectiveness of flipped classroom model on students’ development in an algebra class. The findings showed no significant development of students due to this model. The students in the flipped classroom did only slightly better than students in other classes, however. Similarly, Johnson and Jeremy (2012) checked the impact of the flipped classroom model on a computer applications course. The results revealed no advantage to employing the flipped classroom teaching in a computer application class. A review of the existing literature reveals that, to the knowledge of the researchers, this field of study is under-researched in Iranian classes therefore, this study aimed to investigate the effectiveness of flipped classroom in listening comprehension of Iranian EFL learners.

Today's students have different learning preferences than students from previous generations, and teachers must adapt their instruction accordingly. Access to technology is more prevalent than ever before, and the flipped classroom taps into this resource. Research on the flipped classroom is relatively new, and its success appears to depend on its implementation. No single formula is proven to work, but the flipped classroom shows promise as a way to meet the changing needs of students. As this brief review suggests, research has found evidence of the positive effects of flipped classrooms. Yet very few studies have investigated either quantitative or qualitative differences in students' engagement and learning processes during flipped vs. traditional class time. Moreover, the existing studies, in both L1 and L2 contexts, have been mostly based on survey questionnaires, self-reports, focus group interviews, and students’ test performance after class. In the light of the above researches, the researcher has flipped the English classes for teaching listening skill to Iranian EFL learners.

Regarding the importance of both variables—flipped classrooms and listening comprehension, this study tried to check the impacts of the former one on the later one. In fact, the research questions addressed in this study are as follows:

RQ1: Do flipped classrooms significantly affect Iranian intermediate EFL learners’ listening comprehension?

RQ2: Do flipped classroom significantly improve critical thinking of intermediate Iranian EFL learners?

3. Method

3.1. Participants
From among 60 EFL learners at a private language institute in Isfahan, Iran, forty intermediate EFL learners were chosen based on their performance on the Oxford Quick Placement Test (OQPT). The participants’ age range was from 14 to 16. The selected participants were randomly divided into two equal groups of experimental (n = 20) and control (n = 20). Only female learners participated in the current study.
3.2. Instruments

The first instrument utilized in the present study was the Oxford Quick Placement Test (OQPT), the aim of which was to give a greater understanding of the participants’ level of general proficiency to the researcher. According to the rubrics of this test, the learners whose scores were between 36 and 40 (out of 60) were considered as the intermediate learners.

The second instrument was a researcher-made listening pretest to realize the participants’ listening comprehension level. This 40-item test was designed based on the students’ course book (Interchange Level 1), and comprised of various test formats, including filling the blanks, true or false items, and multiple-choice items. A board of experts confirmed validity of the pretest. In order to establish the reliability of the test, it was piloted on a similar group from another institute, and its reliability index was found to be \( r = .894 \) as calculated through Cronbach Alpha formula.

After the treatment, a modified version of the pretest was administered as the posttest. To wipe out the probable recall of pretest answers, the order of questions and alternatives were changed. The aim of this test was to assess the participants’ listening comprehension after the treatment. It should be mentioned that the reliability of the posttest was computed through the application of Cronbach Alpha formula and it was .799. Also, the validity of the posttest was confirmed by those who validated the pretest.

In addition to the pre and posttests and the flipped materials, in order to gain a better understanding of the issue under question, an interview was administered with the participants in the experimental group. The interview included six questions. In fact, this interview was a modified version of the interview used by Shih and Tsai (2017).

In addition to the above-mentioned instruments, Honey’s (2000) critical thinking questionnaire, adopted from Naeini (2005), was used to measure the participants’ critical thinking. It contained 30 items exploring what a person might or might not do when critically thinking about a subject. It was administered to the participants to evaluate the three macroskills of comprehension: the extent to which one ensures that she has a good understanding of an issue (10 items), analysis: the extent to which one breaks a subject down into its component parts and scrutinizes each part (10 items), and evaluation: the extent to which one considers or assesses a topic in order to judge its value, quality, quantity, importance, condition, reliability, validity and logic (10 items). This questionnaire is a Likert-type questionnaire with 30 items which allows researchers to investigate learners’ ability in note-taking, summarizing, questioning, paraphrasing, researching, inferencing, discussing, classifying, outlining, comparing and contrasting, distinguishing, synthesizing, and inductive and deductive reasoning. The participants were asked to rate the frequency of each category they use on a 5-point Likert-scale, ranging from never (1 point), seldom (2 points), sometimes (3 points), often (4 points), to always (5 points); therefore, the ultimate score was computed in the possible range of 30 to150. The participants were allocated 20 minutes to complete this questionnaire.

3.3. Data collection procedure

At the onset of the study, the researcher attended a language institute and gave the OQPT to 60 Iranian EFL learners to determine their level of English proficiency. Then, 40 intermediate students were chosen, and they were randomly divided into two groups; an experimental group \( n = 20 \) and a control group \( n = 20 \). Then, both groups were pretested by a listening test. After that, the researcher put the participants of the experimental group in the flipped classroom and the control group in the non-flipped classroom. The flipped classroom was equipped with the Internet, computer, and projector. Participants in this classroom were allowed to bring their smartphones to the classroom and use them during learning. On the other hand, the non-flipped classroom was deprived of the mentioned facilities and the students were forbidden to use their smartphones while learning. The students in the flipped class were given 6 audio files of Interchange book
(level 1). They were required to listen to each file before the class and discuss it with the classmates. The teacher, then, could elicit some information, ask them some questions or give them a test. Also, she could ask them to give a lecture on the topic. It is worth recalling that the instructor developed a group in the Telegram app during the treatment sessions for the flipped group and taught them how to watch and listen to the materials posted in the group and how to partake in the group conversation. As far as listening exercises are concerned, audio files and videos of related book topics were submitted to the group three days before each session. The students were invited to comment on the audios and videos they had already heard and watched and report their personal opinions and perspectives with regard to inside-class events. This phase was undertaken in two types of full class and group discussions in which the students were split into groups and shared their thoughts with members of their group. As for the teaching in the control group, the course was taught using the mainstream Communicative Language Teaching (CLT) method. Without any previous class planning, audio and videos were displayed for the learners inside the class. More than 50 percent of the class time was spent on viewing videos and the teacher’s teaching in a 90-minute class time, and the rest on group work and entire class exercises. In fact, the control group participants were exposed to the very same audio files in the class once or twice. Right after listening, they had to respond to questions. Till the last session, this technique proceeded. Under the supervision of the researcher, the procedure lasted 10 sessions of 50-minute sessions. The participants were homogenized in the first session and were pre-tested in the second session. Treatment was performed in sessions 3 to 9; one audio file was taught in each session. Both groups took the listening post test in the last session. The respondents in the flipped classroom were interviewed after the treatment.

In summary, the experimental procedures of the current study were applied in the following three stages: 1) pre-testing, 2) using the flipped classroom, and 3) post-testing. As for pre-testing and posttesting, before and after incorporation of the flipped classroom, the listening comprehension test was given to all students. As for the use of the flipped classroom, it lasted for 10 sessions and went through three stages: planning, implementation, and evaluation. There were two aspects of the planning phase: content preparation and student orientation. Course goals were developed in order to schedule the content, learning results for each lecture were created, and content coverage was specified. In mini videos (for easier streaming and download times), all the information or skill points in each lecture were presented. Each video was 10–15 minutes long, with a total of 50–60 minutes per lecture and a total viewing time of 11.6 hours for all 12 lectures. As Lawrence (cited in Sankey & Hunt, 2013) puts it, there are specialists all over the globe, and by generating more resources, there is no point in recreating the system. As a result, the researcher used video tools from several websites, such as TED (www.ted.com) and YouTube. The researcher presented the notion of the flipped classroom during a class orientation session that lasted 65 minutes, explained the basic concepts, and showed how to work online. This included the wiki ‘s structure and features, how to work with the videos allocated (e.g., repeat, pause, or jump to those points), and how to scan for more videos. The session also included criteria for online interaction, an overview of certain cases, and responses to questions from participants.

The implementation process contains three sections: according to the accepted concept of the flipped classroom model, pre, while, and post class.

3.3.1. Pre-Class
This portion of planning was split into two essential aspects: watching Videos and online quizzes in return. In order to acquire the basic information before class, students watched the brief videos provided for the next lecture each week. On each recording, they had the chance to comment and debate troublesome pieces. Media was made available on flash drives and CDs for the three students with no Internet connection at their homes. One student was also unable to access the content at home, so she came to class early to see the videos on the laptop of the researcher. Each of the short videos was accompanied by an online questionnaire, intended to document the participation of each student, provide him/her further chances to revisit what he/she has learned,
and offer him/her immediate input on whether he/she skipped any important points, in order to maximize the possibility that students will come ready for class. Furthermore, as a starting point for class discussion as well as for modifying the class plan to meet student needs, the researcher used the results of the quizzes.

### 3.3.2. While-class

In this section, to optimize their learning experiences in the classroom, the researcher used the time saved as an incentive to involve the participants more fully in the process of learning the core concepts of the lesson band. It was divided into two main components: the first focused on receiving audience response by recalling the fundamental knowledge, while the second focused on engaging participants with active processes of learning and critical thinking. First, by answering questions, the researcher started class time, both to test the comprehension of participants of the simple principles outlined in the given videos and to assess the optimal use of class time. She also requested questions from respondents that addressed information produced in the videos. The teacher often asked the participants to answer each other's concerns. Moreover, in the online quiz, the teacher analyzed the results of her participants and answered any points of potential uncertainty. It took 15–20 minutes to collect student feedback, so the researcher used the time left in the lecture cycle to apply ideas from the recordings. Through student-centered active learning activities, she actively involved respondents with the course material, where they created, cooperated and put into practice what they learned from the presentations they watched. A number of constructive learning exercises (e.g., 3-2-1, write-pair-share, conversations, comparison/sharing of notes, minute documents, jigsaw, teaching learning, fishbowl, three-step interview) have been used. For a short description of each of these activities, see the Appendix A.

### 3.3.3. Post-class

Reflection and project work were the emphasis of this section. Participants at home logged into an online debate group where both the videos they watched and the active study sessions focused on their experience. The researcher targeted the process of reflection by endorsing answering questions such as: “Did you like the flipped class?”, “What questions do you still have about the topic or exercise?”, and “What suggestions do you have for improving the activity?” In addition, respondents had the chance to post questions for the researcher to answer. Considering project work, participants were grouped into groups of three to four and the researcher allocated a project at the beginning of the term. This project offered further resources for rehearsal, facilitated higher-level thought, and evaluated participants’ abilities to interpret, synthesize and review the information they learned from the course. The project allowed them to develop a technical method that could be used for teaching, as well as to prepare lessons with this method. The instructor posted examples of the project to the wiki course at the start of the course. She also provided assistance via the discussion channel.

During the evaluation phase, participants submitted their projects for additional criticism two weeks before the final submission, so that improvements could be made before the final presentation. Participants discussed their projects during the class session. The researcher assessed the tasks and allowed the participants to assess the tasks themselves and colleagues.

Lastly, in order to investigate the effects of flipped classroom on critical thinking level of EFL learners, the critical questionnaire was administered at the beginning and end of the treatment among the participants in the experimental group. In order to analyze the collected data, firstly, One-Sample Kolmogorov–Smirnov (K-S) test was used to check the distribution normality of the gathered data. Then, paired and independent sample t tests were run to determine the effectiveness of flipped classrooms on Iranian EFL learners’ listening comprehension.

### 4. Results

Before analyzing the pretest and posttest scores, it was indispensable to identify the distribution normality of the scores. Thus, One Sample Kolmogorov–Smirnov test of normality was run on the data acquired from the above-mentioned tests. The consequences are presented in Table 1.
Table 1. One-sample Kolmogorov–Smirnov test of both groups

|                | Kolmogorov–Smirnov<sup>a</sup> |
|----------------|---------------------------------|
|                | Statistic | df. | Sig.  |
| Experimental pretest | .16        | 20  | .19   |
| Experimental posttest | .32        | 20  | .20   |
| Control pretest     | .28        | 20  | .09   |
| Control posttest    | .23        | 20  | .11   |

As shown in Table 1, the scores of the pre and posttests were normally distributed. Therefore, it was concluded that the parametric statistics like independent samples t test and paired samples t test could be used.

Table 2 presents the descriptive statistics of the pretest and posttest. In pretest, the means of both groups were almost equal. The experimental group's mean score in pretest was 13.47 and the control group's mean score was 12.57. This means that both groups were somehow similar in pretest, because they were homogeneous at the beginning of the treatment. But in posttests, the means of the groups were different. The experimental group's mean score in pretest was 16.05, and the control group's mean score was 13.15. This means that the experimental group outperformed the control group on the posttest.

As Table 3 shows, in the pretest, because Sig (.11) is greater than 0.05, the difference between the groups is not significant (p > 0.05). In fact, they performed the same on the pretest. Moreover, Table 3 indicates that in the posttest, Sig (.00) is less than 0.05. This means that the difference between the both groups was significant at (p < 0.05). In fact, the experimental group outperformed the control group on the posttest.

Table 4 presents the results of a paired samples t test which compared the pre and posttests of the experimental and control groups. The difference between the posttest and pretest of the experimental group was found to be significant because Sig (.00) was less than 0.05, contrarily, the difference between the posttest and pretest of control group was not significant because Sig (.06) was higher than 0.05. It could be concluded that flipped classroom affected the experimental groups' listening comprehension significantly.

As mentioned above, in order to gain a better understanding of the issue under study, a semi-structured interview was administered among the participants in the flipped classroom. The results gained from interviews are presented in this section.

Table 2. Descriptive statistics of both groups

| Groups        | N   | Mean  | Std. Deviation | Std. Error Mean |
|---------------|-----|-------|----------------|-----------------|
| Pretest       |     |       |                |                 |
| Experimental  | 20  | 13.47 | 1.73           | .38             |
| Group         |     |       |                |                 |
| Control Group | 20  | 12.57 | 1.80           | .40             |
| Posttest      |     |       |                |                 |
| Experimental  | 20  | 16.05 | .75            | .16             |
| Group         |     |       |                |                 |
| Control Group | 20  | 13.15 | 2.29           | .51             |
Table 3. Independent samples t test (Pretest of both groups)

| Levene’s Test for Equality of Variances | t test for Equality of Means |
|----------------------------------------|-----------------------------|
|                                        | F   | Sig. | t  | df  | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference |
|                                        |     |      |    |     |                |                |                     |                                |
| Pretest                                | .58 | .44  | 1.60 | 38  | .11            | .90             | .56                 | -0.23                          | 2.03                           |
| Equal variances assumed                |     |      |      |     |                |                |                     |                                |
| Posttest                               | 36.45 | .00  | 5.36 | 38  | .00            | 2.90            | .54                 | 1.80                           | 3.99                           |
| Equal variances assumed                |     |      |      |     |                |                |                     |                                |
|          | Paired Differences |          |          |          |          |          |          |          |          |          |
|----------|--------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|          | Mean               | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | t      | df   | Sig. (2-tailed) |
|          |                    |          |          |          | Lower   | Upper   |          |          |          |          |
| Pair 1   | Exp. post—exp. pre | 2.67    | 1.85    | .41      | 1.80    | 3.54    | 6.43    | 19       | .00      |          |
| Pair 2   | Cont. post—cont. pre | .62    | 1.44    | .32      | -.04    | 1.29    | 1.94    | 19       | .06      |          |
The respondent learners stated that through the use of flexible environments such as web-based and mobile environments for class preparation and participation, flipped classroom engaged students in the learning process. The respondents believed that flexible teaching environments provide a learning-by-doing environment. Considering the classroom environment, one of the participants stated that “The teaching method was interesting and engaging. The interaction time in class was more and activities became more interesting”.

Another respondent learner claimed that: I can improve my listening comprehension through the Internet. I could listen to the voice clips before class; therefore, I could easily understand it in class and answer the teacher’s question.

In terms of classroom management, the L2 learners believed that flipped classroom was learner-centered. They believed that different activities like brainstorming, games, practice, and presentation were used in the flipped classroom. Some learners believed that through these activities, students could improve their listening comprehension. Some other students claimed that through flipped activities, students can cooperate, and they can improve various skills such as critical thinking and communication in the process of learning. One of the respondents stated that: “This type of classroom had a lot of homework assignment; however, these assignments were not boring like the assignments in traditional classrooms.”

Considering the content of teaching, some students stated that the learning materials were very much, and this makes the flipped classroom somewhat boring; however, the materials were mostly self-learning materials, and this improved the learning outcome. A learner stated that: “When there is variety in the educational content, the learners may be unwilling to prepare for classroom”. Another learner stated that: “There were a lot of materials; however, the great amount of learning materials may hamper learners’ willingness to listen.”

The respondent learners stated that in flipped classrooms, the teachers should be professional educators. The results of the interview revealed that traditional L2 teachers mostly considered students to be passive learners, while in flipped classrooms students need to preview the materials, and this creates more active learners. The students believed that in flipped classes, the teacher had more communication with students to change them into active learners.

On the other hand, some respondents stated that the fact that they have to do the homework assignments out of class, limits the interaction with peers or the teacher.

In addition, some L2 learners believed that the flipped classroom produces an active learning environment, in which the learners learn-by-doing and experience meaningful learning. The learners stated that in flipped classes, the learners make a great effort during the process and have a feeling of achievement. One of the respondents claimed that: “I liked this teaching method; it improved my presentation-making abilities.”

To wrap it up, the interview results mostly revealed that the participants had positive attitude towards flipped classrooms. The second research question of the present study intended to find out whether flipped classrooms can enhance critical thinking of EFL learners. To this end, a questionnaire of critical thinking was distributed among participants in experimental group before and after the treatment. The results are presented below.

Such descriptive statistics as mean and standard deviation are shown for the critical thinking questionnaire before and after the treatment in Table 5. The mean score of the experimental group before treatment was (M = 76.60) which was less than the mean score of after the treatment was (M = 101.27). However, before further analysis of the scores, it was necessary to make sure that the conditions of running parametric procedures were met. Normality of distribution is an important prerequisite before running a t test. To test normality of the distribution of the scores, the Kolmogorov–Smirnov test was run
on the scores of the questionnaire. Table 6 shows the results of analyzing the normality of distribution of the scores of critical thinking questionnaire before and after treatment.

As Table 6 shows, the significance levels are .66 and .55 which are higher than the identified level of asymp significance (.66 & .55 > .05), so it was concluded that the distribution of the critical thinking scores before treatment, was normal. Having ensured the normality of the distribution of the critical thinking scores, the performance of the participants was compared using paired samples t test. As it was said earlier, the difference between the critical thinking questionnaire before and after treatment seemed to be a significant one, but to ascertain whether it is or not, one needs to look down the Sig (2-tailed) column in the t test Table 7 below.

Since Sig. (2-tailed) value was lower than the alpha level (.001 < .05), it could be argued that there was a statistically significant difference between the scores of the critical thinking questionnaire, before and after the treatment. This led to the rejection of the null hypothesis of this study according to which using flipped classroom procedures as a pedagogical strategy does not improve critical thinking of intermediate Iranian EFL learners significantly.

### 5. Discussion

The present study intended to investigate if flipped classrooms significantly affected Iranian intermediate EFL learners’ listening comprehension. The results of the data analysis indicated that delivering instruction through flipped classrooms led to better performance compared to traditional classrooms. The findings statistically showed that the experimental group significantly did better

| Critical thinking scores before treatment | Critical thinking scores after treatment |
|------------------------------------------|----------------------------------------|
| N                                        | 20                                     |
| Mean                                     | 76.60                                  |
| Std. Deviation                           | 27.64                                  |
| Std. Error Mean                          | 5.04                                   |

| Critical thinking questionnaire before treatment | Critical thinking questionnaire after treatment |
|-------------------------------------------------|-----------------------------------------------|
| Mean                                             | 101.27                                        |
| Std. Deviation                                   | 28.53                                         |
| Std. Error Mean                                  | 5.20                                          |

#### Table 5. Descriptive Statistics for Comparing the Critical Thinking Questionnaire Scores Before and After the Treatment

|                  | Mean | N  | Std. Deviation | Std. Error Mean |
|------------------|------|----|----------------|-----------------|
| Pair 1           |      |    |                |                 |
| Critical thinking questionnaire before treatment | 76.60 | 20 | 27.64 | 5.04 |
| Critical thinking questionnaire after treatment  | 101.27 | 20 | 28.53 | 5.20 |

#### Table 6. One-sample Kolmogorov–Smirnov Test for Critical Thinking Questionnaire

| Normal Parameters* | Critical thinking scores before treatment | Critical thinking scores after treatment |
|--------------------|-------------------------------------------|----------------------------------------|
| N                  | 20                                        | 20                                     |
| Mean               | 76.60                                     | 78.50                                  |
| Std. Deviation     | 27.64                                     | 26.48                                  |

| Most Extreme Differences | Critical thinking scores before treatment | Critical thinking scores after treatment |
|--------------------------|-------------------------------------------|----------------------------------------|
| Absolute                 | .13                                       | .14                                    |
| Positive                 | .10                                       | .10                                    |
| Negative                 | -.13                                      | -.14                                   |

| Kolmogorov-Smirnov Z     | .72                                       | .79                                    |
| Asymp. Sig. (2-tailed)   | .66                                       | .55                                    |

* Test distribution is Normal.
Table 7. Results of the Paired Samples T Test for Comparing Scores of Critical Thinking Questionnaire

| Paired Differences | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference |
|--------------------|------|----------------|-----------------|------------------------------------------|
|                    |      |                |                 | Lower | Upper |
| Pair 1             | -2.46| 37.80          | 6.90            | -38.78 | -10.55 |
|                    |      |                |                 | -3.57 | 29    | .00   |

Etemadifar et al., Cogent Education (2020), 7:1835150
https://doi.org/10.1080/2331186X.2020.1835150
than the control group ($p < .05$). Participants in the flipped classrooms were highly motivated to learn because of the available facilities. Not only did they enjoy the learning, but also, they felt satisfied with what they learned. In fact, they gained higher scores in their posttest. This may be due to some appealing features the flipped classrooms have.

A probable reason for the results reached in this study may be that the flipped classroom required participants to watch videos before class that explained the content of each lecture. They had to listen attentively to these videos in order to answer the online quiz as well as to gain a basic background about the content that would enable them to participate effectively in classroom discussion. Here, it can be argued that watching these videos could have improved the listening comprehension of the participants for three reasons. First, listening to native speakers could have made participants aware of the difficulties of understanding spoken authentic English. This might have led them to try harder to enhance their listening comprehension skills. Second, the presence of non-verbal communication features (e.g., facial expressions & gestures) could have been useful for participants in comprehending the listening material. Third, the technical features of videos (e.g., pausing, reviewing, etc.) might have provided participants with opportunities for analyzing and comprehending the language presented. In this respect, many studies found that the use of videos improves listening comprehension (e.g., Sarani et al., 2014; Wagner, 2010).

Another characteristic of the flipped classroom that could explain its effectiveness in improving listening comprehension is the active learning component. In the present study, class time was used in engaging participants in active learning activities based on collaboration, interaction, and discussion in English which might have improved participants’ listening comprehension. This explanation goes along with Jones’s (2006) assertion that collaborative activities have long been shown to enhance learners’ comprehensible input which, in turn, leads to greater understanding of aural texts. It also goes along with the findings of some studies that found that active learning improves listening comprehension (e.g., Ashraf et al., 2013).

However, the results clearly demonstrate not only that the students felt confident and able to learn listening comprehension at home alone, but also, they were willing to continue to do so after the study. They also came to class more prepared and they valued the time created by moving the listening comprehension outside the class, allowing for more meaningful, communicative speaking tasks. Also, of importance was the observation that L2 students seemed to take more risks in using the language after studying listening comprehension at home.

The results of this study are in line with Zakareya Ahmad (2016) who investigated the effect of the flipped classroom model on Egyptian EFL students’ listening comprehension. He concluded that the flipped classroom had a significant effect on the listening comprehension of Egyptian EFL students.

Moreover, this study result agreed with Strohmyer (2016) insights that students who experienced flipped classroom method pointed out positive perceptions of increased engagement and interactions, as well as more in-depth learning in flipped environments. This method supports how students learn, provides more opportunities to interact with their peers and the teacher in a productive and active learning by utilizing critical thinking skills. The study of Chipp (2013) indicated that the classroom in which strategy of flipped learning are used, achieve higher results in tests than the classroom in which strategy of traditional method is used.

Furthermore, the participants enjoyed the flipped content, in particular the videos and the flexibility the content provided. They appreciated being able to work through the listening comprehension activities at their own pace and the option of managing the amount of work they could choose to do.
The major difference between flipped and traditional classrooms is the timing of content learning: Students in a flipped classroom learn the content before class in their own private time and space and at their own pace, while traditional classroom students learn it in class in a way and at a pace that are determined by the instructor. Therefore, the rich cognitive activity (e.g., in-depth information processing and higher-order thinking processes) observed in this study’s flipped classroom may have been due to the students having more time to think about the content and activate relevant prior knowledge related to the content.

The findings of the present study are in line with cognitive load theory (Sweller, 2007). This theory claims that learners’ “cognitive capacity in working memory is limited, so that if a learning task requires too much capacity, learning will be hampered” (de Jong, 2010, p. 105). The flipped classroom enhances the capacity of the learners to learn, and this may lead to better performance of EFL learners.

These findings are largely consistent with other practitioners’ findings after implementing Flipped learning in their contexts (Bergmann & Sams, 2012; Bishop & Verleger, 2013; Strayer, 2012). However, one positive difference from previous reports is that not one student “strongly disliked” the changes as reported by Bishop and Verleger (2013). A further implication of the positive views would be that L2 students, over time, would have an increased sense of progress leading to improved student satisfaction.

The results of this study indicate that the students in the flipped classroom interacted more deeply and cohesively than the students in the traditional classroom. The obtained results are in line with Kim et al. (2017) who investigated the cognitive effects of the flipped classroom approach in a content-based instructional context by comparing second language learners’ discourse in flipped vs. traditional classrooms. Quantitative and qualitative analyses indicated that the students in the flipped classroom produced more cognitive comments involving deeper information processing and higher-order reasoning skills and showed more cohesive interactional patterns than did the students in the traditional classrooms. The results indicated that flipped classrooms can effectively promote higher-order thinking processes and in-depth, cohesive discussion in the content-based second language.

The findings of this study are supported by Szparagowski (2014) who investigated the flipped or inverted classroom and its impacts on student learning. The data were gathered from student grades, a pre and post survey, a class interview/discussion, and the researcher’s personal notes from instructing. The outcomes demonstrated that some potential advantages of the flipped classroom make it a type of instruction that educators ought not to ignore. Moreover, the obtained results are in line with Yoshida (2016) who found that instructors should promote learners’ perceived usefulness of flipped learning. Flipped learning requires L2 learners to autonomously study at home and collaboratively study in class.

In addition, the findings are in line with the study by Marlowe (2012) who indicated that lower stress levels among participants in this kind of classroom environment compared to other types of classes and showed that students had positive feelings towards the treatment and enjoyed the associated advantages of being able to select their own homework and discover concepts they found fascinating.

The aftereffects of this study are not supported by Lisa and Jeremy (2012) who contemplated the impact of the flipped classroom model on an auxiliary electronic application course, student and educator observations, inquiries, and student improvement. The discoveries uncovered that there was no advantage to utilizing the flipped classroom instruction in a secondary electronic application.

Furthermore, the results of the present study contradict with the study by G. Overmyer (2014) who investigated the effectiveness of flipped classroom model on students’ development in an
algebra class. This is due to the length of some of the electronic contents, which took almost one hour and led to the dissatisfaction of students with the flipped classroom model. Moreover, the findings showed no significant development of students due to this model. Similarly, the results contradict with the results of the study by Johnson and Jeremy (2012), revealed no advantage in employing the flipped classroom teaching in a computer application class. This is due to reason that the flipped method does rely on students preparing for their classes ahead of time. If the student is already a social loafer then this method will mean they don't complete their own work or learn.

Regarding the better performance of experimental group in critical thinking, we might infer that the principles and the process of flipped classroom assisted the experimental group participants to explore their mind and thoughts as the initial phase for sharpening their critical thinking to be better. Otherwise, the traditional method, which was implemented in the control group classroom and characterized by listening to the teacher explanation, did not give a big contribution to their critical thinking skills development. The students tended to be passive and only be feed with information about certain topics. It might cause their learning to be loaded with absorbing information and memorization.

Johnson (2013) carried out research similar to the current study and concluded that Flipped Learning-supported instruction enabled students to think critically. Zeren (2016) also conducted a study in line with the current research and found that flipping lectures promote independent learning for university students. However, Saunders (2014) conveyed through her research that the flipped classroom was not an essential factor in increasing student critical thinking skills. Therefore, the study was able to verify the effect of the flipped classroom for sharpening students' critical thinking. The intervention for the flipped classroom was effective to help them to explore their thoughts and develop their critical thinking.

The experimental students believed that the flipped method developed critical thinking skills in individuals. This method persuaded the students to think deeply and critically. One of the objectives of training through the flipped classroom is focusing on the use of knowledge and having critical thinking skills (Pluta et al., 2013). This type of classroom enables learners to practice deep thinking by linking the concepts of the course to their clinical application (Hanson, 2015).

The results of this study are consistent with Asmara et al. (2019) who investigated the effect of flipped classroom on learners’ critical thinking skills of inference and explanation—the flipped classroom used lecturing video as homework and group discussion as classroom activities. The participants were 60 participants aged 19–20 years old. Using quasi-experimental research, this study measured the effect size with the dependent analysis of variance (ANOVA) from the pretest-posttest score on critical thinking skills. Through 10-week intensive meetings, the two groups were identified as intact and control groups and asked to do the procedure starting from the pretest to posttest. The study was able to confirm the effect of the flipped classroom for sharpening students’ critical thinking. The intervention for the EFCG was effective to help them to explore their thoughts and develop their critical thinking.

6. Conclusion
The outcomes demonstrated that Iranian EFL students can take advantage of flipped classroom model. In light of the findings of the present study, it tends to be presumed that the executing of flipped classroom in educating and learning can create positive outcomes because they could assimilate L2 learners in learning English. The beneficial outcomes of utilizing flipped classroom wound up clear after the treatment. Here, it can be asserted that getting teaching through utilizing flipped classroom can encourage English learning. Flipped classroom can make the L2 learners autonomous and help them figure out how to ponder out of the classroom.
This study indicates that using the flipped classroom with EFL learners can have a positive effect on their self-confidence in applying listening comprehension activities. L2 learners tended to achieve better results on tests having been taught using the flipped classroom technique. Participants in the study were generally positive about the use of audio files for receiving initial listening comprehension explanations and would clearly like to continue in this way. As the sample was quite small, no conclusions can be generalized to adult EFL learners. This study aimed to explore whether these groups of adult EFL learners would benefit from this way of learning, and how the teacher could better prepare listening comprehension explanations in the future. The importance of in-class activities, in addition to audio and video content, needs to be considered when measuring the effect of the flipped classroom model, as an essential part of this technique. The author believes they will continue creating audios and videos content for their adult EFL groups and aims at improving the quality of these audios and videos. If L2 learners continue achieving positive results, the author might also share these audios and videos with colleagues to use. Adult EFL learners seem to prefer to spend much of their in-class time on practicing the language—this indicates implementing the flipped classroom technique with at least some lessons to be beneficial.

The outcomes of this research can support the communication between the L2 instructors and the learners. Supporters of the flipped classroom guarantee that this training advances better student instructor collaboration. Bergmann and Sams (2012) claims that when educators are not remaining in front of the class, they can promenade and speak with learners.

The results of the present research are likewise helpful for the educators. Indeed, the flipped classroom includes a change of the instructor’s role. In a conventional class, L2 instructor can be portrayed as the sage on the stage that presents data in engaging routes with the expectation that L2 learners will focus and retain the data (Bergmann & Sams, 2012). The flipped classroom moves from this thought, setting the educator in the role of the guide on the side who works with the L2 learners to manage them through their individual learning experiences (Bergmann & Sams, 2012). The guide role can be outlined utilizing Freire’s thought that training “ought not include one individual following up on another, but rather people working with each other” (Smith, 2012, p. 1). The findings of this study suggested that instructors should promote learners’ perceived usefulness of flipped learning.

From pedagogical perspective, this study sheds light on the importance of a learning environment that encourages active and cohesive interaction in classrooms. It also contributes to considering how the environment for active learning can be better achieved by incorporating technology in pedagogical practices. The study emphasizes the fact that L2 students in content-based instruction can benefit from accessing materials prior to class meeting because having prior knowledge enhances their ability to engage in cohesive discussion, in-depth thinking, and construction of knowledge during class. Developing critical thinking ability has been a longstanding goal in content-based L2 classrooms; there is general agreement that this skill does not naturally grow along with L2 development but requires intensive training. All in all, the present study has provided a glimpse into how flipped classrooms can facilitate English language learning.

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**Appendix A:**

1. How do you feel about the flipped classroom activities for each unit?
2. How do you feel about the flipped classroom self-study?
3. How do you feel about the in-class flipped classroom participatory learning?
4. How do you feel about the post class review?
5. How do you feel about classroom management in the flipped classroom?
6. How do you feel about learning environment in the flipped classroom?
