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Research article

## Flipped Instruction of English as a Foreign Language: Effects on Reading Comprehension and Speaking Skills

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### Abstract

This study investigates the development of reading comprehension and speaking skills through flipped instruction of Iranian intermediate EFL learners. The current study adopts a quasi-experimental design: 50 female students at Koosha institute in Langarud were selected. Their age ranged from 11 to 16 years. The group of participants was homogenized using the Nelson proficiency test. Participants were then assigned to the experimental and control groups. Each group consisted of 25 students. Both groups were taught by the same teacher. Moreover, the same syllabus and textbook were used for both groups. After that, the pre-tests of speaking and reading skills were administered to both groups to test students' reading comprehension and speaking level before the flipped instruction. Then the experimental group was exposed to flipped instruction for 8 sessions while the control group received a placebo. Finally, the post-tests of reading comprehension and speaking skill were administered to both groups in order to find out significance differences between them. The results showed that the experimental group outperformed the control group in reading comprehension ( $p = .004$ ,  $p < .05$ ) and speaking skill ( $p = .003$ ,  $p < .05$ ). Furthermore, we found that the experimental group demonstrated greater improvement in speaking skills compared to reading during flipped instruction.

**Keywords:** EFL Learners; Flipped Instruction; Language; Reading Comprehension; Speaking Skill; Technology

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Научная статья

## Перевернутое обучение английскому языку как иностранному: Влияние на понимание прочитанного и навыки говорения

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### Аннотация

В этом исследовании изучается развитие навыков понимания прочитанного и говорения посредством технологии перевернутого обучения у изучающих английский язык как иностранный на уровне Intermediate в Иране. Текущее исследование использует квазиэкспериментальный дизайн: было отобрано 50 студенток института Куша в Лангаруде в возрасте от 11 до 16 лет. Группа участников была гомогенизирована с помощью теста на уровень владения языком Нельсона. Затем участники были распределены на экспериментальную и контрольную группу, каждая из которых состояла из 25 студентов. Обе группы обучались у одного преподавателя, использовались одна и та же учебная программа и учебник. Группам были предложены предварительные тесты навыков говорения и чтения, чтобы проверить понимание прочитанного и уровень говорения учащихся перед перевернутым обучением. Затем экспериментальная группа обучалась в формате перевернутого класса в течение 8 занятий. Наконец, обеим группам были предложены последующие тесты навыков понимания прочитанного и говорения, чтобы выяснить значимые различия между ними. Результаты показали, что экспериментальная группа превзошла контрольную группу по пониманию прочитанного ( $p = .004$ ,  $p < .05$ ) и навыкам говорения ( $p = .003$ ,  $p < .05$ ). Кроме того, мы обнаружили, что экспериментальная группа во время перевернутого обучения продемонстрировала большее улучшение навыков говорения по сравнению с чтением.

**Ключевые слова:** Изучающие английский язык как иностранный; Перевернутое обучение; Язык; Понимание прочитанного; Навык говорения; Технологии

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## INTRODUCTION

New forms of instruction have emerged that are now influencing education positively as they induce students to learn independently. Nowadays, the trend is toward using more technology in education. Indeed, technology in education is an ever-evolving process and demands that students and instructors adapt to the emerging technologies in education. By utilizing various technological devices, the learners can study in different locations and times through collaborative distance learning. Therefore, living in a digital age and using various technological tools, many learners know how to work independently and collaboratively before coming to the classroom. This positive impact of technology has influenced the development of instructional technology in education and replaced the blackboard by online video lectures (Evans, 2011). Moreover, the traditional learning approach which focuses on the instructor at the center of knowledge-transmission is irrelevant in today's digital age (Wang & Heffernan, 2010). The recent pedagogical trend of flipped classroom instruction shifts direct instruction from the group space (face-to-face learning) to individual learning (online individual learning). Moreover, it provides students with direct access to video lectures, slides, and other teaching resources on online educational platforms. Therefore, students are given more opportunities to apply the knowledge they have acquired in the real-life situations of a collaborative learning environment which results in more learning interactions, improving students' achievement and boosting critical thinking. Indeed, blended learning is one of the prominent applications so far that creates a learning environment which affords better achievements (O'Flaherty & Philips, 2015). It can be said that the flipped classroom is a part of blended learning in which students have control over 'time, place, path and/or pace' during the learning-process (Staker & Horn, 2012). Besides, they are active participants in that process (Hamdan, et al, 2013). However, flipped learning is different from "Distance Learning" or "E-learning." While students learn contents completely online in Distance Learning and E- learning, students in a flipped learning environment deliver the learning materials or video lectures online, and they dedicate classroom hours to feedback and collaborative learning with teacher and peers. Flipping the classroom reinforces the idea that learning is not restricted to 'brick-and-mortar location' establishments (Staker & Horn, 2012).

Although flipped instruction was a good alternative to face-to-face instruction during the COVID-19 pandemic, it is not common in the Iranian educational system. Both teachers and students are accustomed to face-to-face methods of teaching and learning. Moreover, the speed of the internet is low in some especially rural areas which makes online teaching difficult. In addition, classrooms for teaching English have a number of limitations including incompetent teachers, insufficient time, sources, and materials, lack of technology, and anxiety in EFL learners (Hashemifardnia et al., 2018). Irrespective of all these problems and perhaps as part of their solution, this study focuses on the effectiveness of using flipped instruction in respect to Iranian intermediate EFL learners'



reading comprehension and speaking skills. Although, there have been numerous studies that provide evidence for the benefits of flipped instruction, many of these suffer from a questionable methodology (e.g. inference from a small number of student responses). Despite difficult external conditions, this research aims to establish the effect in a rigorous controlled experiment. It affords conclusions about the impact of flipped instruction on student engagement, comprehension, and overall academic performance in diverse learning environments. Thus, this research poses the following questions:

Q1. Does flipped instruction have a statistically significant effect on intermediate EFL learners' reading comprehension?

Q2. Does flipped instruction have a statistically significant effect on intermediate EFL learners' speaking skill?

Based on these questions and the ensuing research, the following hypotheses are to be evaluated.:

H01: Flipped instruction does not have a statistically significant effect on intermediate EFL learners' reading comprehension.

H02: Flipped instruction does not have a statistically significant effect on intermediate EFL learners' reading comprehension.

If the observed effects are statistically significant, these negative hypotheses can be rejected and the opposite assumed to hold:

## LITERATURE REVIEW

Flipped instruction is a pedagogical model in which traditional lecture, homework elements, and roles are reversed. Through flipped instruction students are immersed in responsive learning environments that are designed to prepare and motivate them to confidently undertake assessment tasks. They do so interactively by way of feedback loops that are strategically embedded at all stages of the learning process. Tareq Mitib Murad (2009) was one of the pioneers of using flipped instruction in teaching language skills. He investigated the effect of flipped learning for improving the speaking ability of Palestinian secondary learners and their attitudes towards English. His statistically significant findings showed that flipped instruction noticeably improved the speaking ability of the learners in the experimental group; also, their attitudes towards English were affected positively.

Jamie Betry, as cited in Tran Thi Thanh Quyen and Nguyen Van Loi, studied the use of technology in preparing EFL students for oral presentations. The students in the experimental groups had to go to the school's computer lab to search for information on their presentations' topics. When the content was prepared and ready, they learned to work with the program 'Audacity', which allowed them to hear their own voice. Then, they used flip cameras to prepare for their presentations. By this way, the partners recorded each other and reviewed the video clips so that they could comment and learn from one another. Meanwhile, the control group followed the traditional instructional method. The outcomes revealed that the use of technology during preparation made



presenters more confident (Quyen & Loi, 2018). The study by Mireille Farah (2014) showed that the flipped classroom was an effective instructional method to improve twelfth-grade Emirati female students' IELTS (International English Language Testing System) writing performance. He also examined their perceptions of the flipped instruction in a writing setting for ESL (English as a Second Language). The results indicated a significant difference between the mean scores in favor of the experimental group, and students' positive attitudes towards this model. Marion Engin (2014) carried out research in which the researcher combined flipped instruction with second language writing skills. The researcher expected students to create their own videos on how to learn second language writing skills. The aim of the research was to make students active participants in the learning process. The study showed that student-created videos promoted learning and accuracy in English.

Arash Hashemifardnia, Ehsan Namaziandost and Sajad Shafiee investigated the impact of the flipped classrooms on reading comprehension among Iranian secondary school students. Researchers placed an experimental group of respondents in a flipped classroom. The flipped classroom was fully equipped with internet, computers, and projectors. Students had to read each text and discuss it with their classmates before coming to class. The control group, on the other hand, was taught in a traditional classroom. Results showed that the experimental group significantly outperformed the control group in the post hoc test ( $p < 0.05$ ). Similar to this research, Uraivan Sae-Ong 's (2010) and Shakiba Zarinpard, Mehrak Rahimi and Ahmad Mohseni (2020) also claimed that the flipped classroom had significant effect on the development of English reading comprehension. In related research Sabahattin Yeşilçınar (2019) examined the effect of the flipped classroom model (FCM) on the English-speaking skills of adult EFL learners who were not majoring in English. It was concluded that the participants were positively affected both in their speaking skill and in their attitude towards learning English. Mohamad Yahya Abdullah, Supyan Hussin and Kemboja Ismail also probed whether flipped classrooms have a significant impact on English-speaking performance. In a paper entitled "Implementation of Flipped Classroom Model and its Effectiveness on English Speaking Performance" they reported that FCM allowed for a more significant development than that of peers who received traditional instruction (Abdullah et al., 2019). They argued that flipped classrooms play a very positive role in the development of speaking skills.

Despite these positive findings, Manal Al-Ghamdi and Abdullah Al-Bargi (2017), found that flipped classrooms had no significant effect on the speaking skills of EFL Saudi learners. They mentioned that it may be because the population of their study was small. Mojdeh Shirvani, Ahmad Mohseny and Gholamreza Abbasian (2022) also investigated the impact of flipped instruction on EFL students' conversational skills and attitudes towards flipped learning. Four intact classes of 60 EFL students were divided into control and experimental groups. The results showed that flipped instruction had a



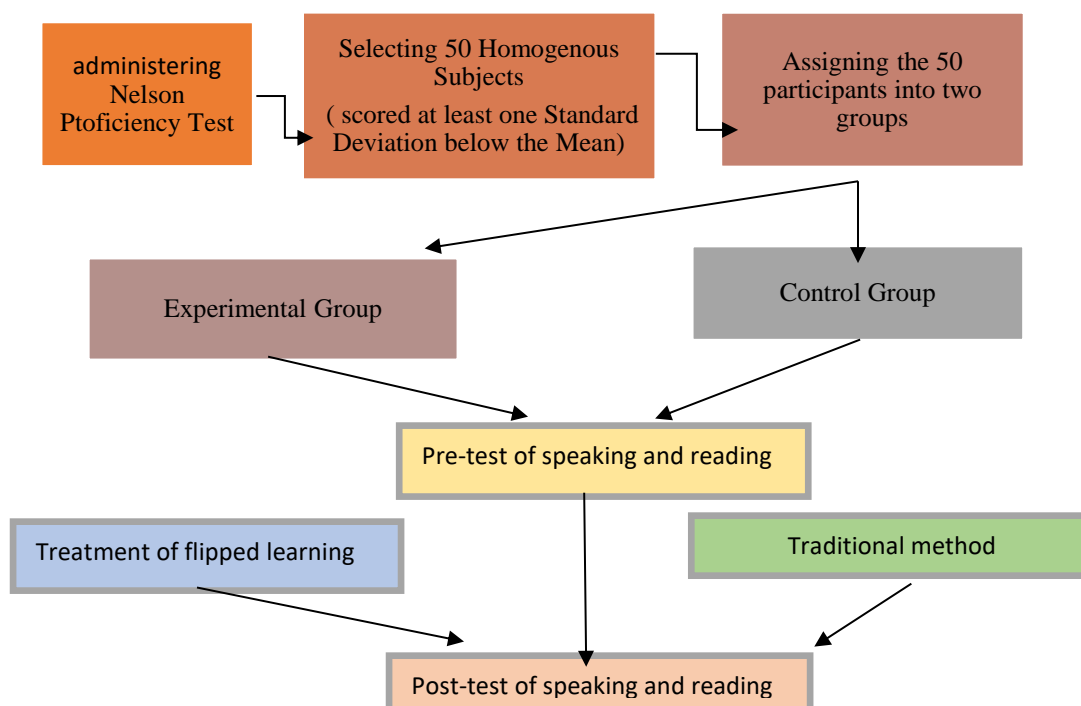
positive effect on the conversational skills of EFL students. It was also found that the attitude of the participants in the experimental groups towards inverted flipped classroom changed in a positive direction.

The review of the literature thus indicates that flipped classrooms have a significantly more positive impact on learners' achievements than traditional classrooms. This study adds to this literature with respect to Iranian EFL students' reading comprehension skill and speaking ability. It seeks to solidify previous results by showing how one can overcome problems of self-selection and small populations through the rigorous and transparent experimental design and significance testing.

## METHODOLOGY

### Research Design

Quasi-experimental design was used in the current study. The rationale behind using such a design resides in the fact that there was no random selection of subjects. The design includes the following main stages: 1) subject selection via administration of the Nelson Placement Test, 2) exposing participants to the pre-tests, 3) treating the experimental groups of the study to flipped instruction 4) conducting the post-tests. The design of the present study is diagrammatically illustrated below in figure 1:



**Figure 1.** The Diagram of the Design of the Study





## Participants

The participants of the study were 50 female students at “Koosha Institute” in Langarud, Guilan, their ages ranging from 11 to 16 years old. The teacher selected the participants based on her prior acquaintance with them. Therefore, the participants were already familiar with the procedure of the classes. The participants first took the Nelson proficiency test, then were assigned to the experimental and control groups. There were 25 students in the experimental group and 25 students in the control group. Both groups were taught by the same teacher and used the same syllabus and textbook.

## Materials

To investigate the research questions of the present study, a few instruments were used. First, the Nelson proficiency test was used in order to homogenize the learners. After dividing the participants into experimental and control group, they had 8 „treatment sessions.“ Having finished these sessions, the Preliminary English Test (PET) of speaking (pre-post) and the TOEFL reading comprehension (pre-post) were administered.

## Nelson Test

The Nelson Test was developed by William Fowler and Norman Coe. The test was constructed to measure the language proficiency of students. The Nelson English language proficiency test (400 A) (Fowler & Coe, 1976) consists of 50 multiple-choice items organized in four parts: grammar (two sections), vocabulary, and reading comprehension. The time allotted is 40 minutes. The reliability of the Nelson proficiency test (1976) was reported to be 0.87. The researchers selected participants based on non-random convenience sampling. They participated in a homogeneity test (Nelson) and participants whose scores were one standard deviation above and one standard deviation below the mean were selected. From the 50 participants that were selected as the result of this test for homogeneity, 25 were assigned to the control group and 25 served as the experimental group.

## Speaking (Pre-/Post-Test Preliminary English Test)

PET is a test which has four parts including reading, speaking, writing and speaking. It includes; 35 items in 5 sections for reading comprehension, 7 items in 3 sections for writing, 25 items in 4 sections for listening, 25 items in 4 sections for speaking. In the present study only speaking sections was utilized. The researchers got help from two raters to evaluate speaking ability of EFL learners. The speaking section of PET consists of four parts. In part 1, each candidate interacts with the interlocutor which takes 2-3 minutes. In part 2, the candidates interact with each other. Making and responding to suggestions, discussing alternatives, making recommendations and negotiating agreement. Part 3 is the extended turn, and the candidates respond to photographs and manage discourse in a longer term. And finally, part 4 is a general conversation where



candidates talk about their likes/dislikes, preferences, experiences, habits, etc. The raters awarded a mark for the performance as a whole, using the Global Achievement scale. The assessor awards marks based on four criteria:

- Grammar and Vocabulary
- Discourse Management
- Pronunciation
- Interactive Communication.

### **Reading comprehension (pre-/post-test)**

For reading tests, two articles from “In-a-flash: Reading for the TOEFL Test,” (Broukal, 2002) were selected and used. The aim of the pre-test was to test students’ reading comprehension level before the flipped instruction. The pre-test consisted of 20 multiple-choice items. Items 1 and 11 were designed to test the main idea and topic. Items 2, 3, 10, 14, 15, 17, and 19 are detailed questions. Item 4, 5, 6, and 14 are inference questions. Items 7, 8, 9, 16, and 18 were designed to test students' abilities to guess the meaning of a new word in English. Item 12 is designed to test students' abilities to understand the author’s intention. Item 20 is designed to test whether students can recognize the writing pattern used in the text. As for the post-test, another two articles from " In-a-flash: Reading for the TOEFL Test " were chosen. The aim of the reading comprehension posttest was to analyze if the students make any improvement after the flipped instruction. The post-test consisted of 20 multiple-choice items. Items 5 and 13 were designed to test the main idea and topic. Items 2, 3, 4, 16, 17, 18, and 20 were detailed questions. Items 1, 12, and 15 were inference questions. Items 6, 8, 10, 11, and 19 were designed to test students' abilities to guess the meaning of a new word in English. Items 7, 9, and 14 were reference questions. Only the multiple-choice questions were selected as test questions in order to enhance the objective comparability of pre-test and post-test.

### **Procedure**

At the beginning of the experiment, the Nelson proficiency test was administrated by the teacher, and it would be completed by the experimental and control groups to exclude that there were significant differences between them regarding their proficiency levels in L2 reading and speaking. The 50 students were assigned into two groups, experimental and control groups. During the implementation of the research process, the experimental and control groups were instructed through reading procedures and conversation using the same teaching schedule and textbook. Two groups were assigned to be taught in either the flipped learning method (Experimental group) or a traditional way of teaching (Control group). In flipped classes, the teachers taught the materials through video calls at home. The teachers delivered lessons via video conferencing from students’ homes. This means that students could engage with the teachers live during these sessions, allowing for real-time interaction, questions, and discussions, while still having the flexibility to learn the content at their own pace. This approach combines





online learning with personal instruction, making it a hallmark of the flipped classroom model. In online classes, they also learned to prepare materials, listened to audio clips, watched and summarized videos, and played games. In particular, they played the "Call of Duty"-game online which helped them have some conversations in English. In addition, the teachers assigned short videos on relevant speaking topics (e.g., pronunciation, conversation starters) for students to watch before class. This could involve watching videos of native speakers, listening to dialogues, or practicing pronunciation exercises. In class, they practiced speaking on chosen topics. During face-to-face sessions, students engaged in discussions, pair work, role-plays and collaborative learning.

In the same way reading comprehension practices were carried out during treatment sessions. The teachers provided students with reading materials (articles, short stories, or digital texts) to read at home. This also included videos prepared by the researchers that had summarized key concepts or discussed the themes of the texts. The teachers also introduced some online games or apps related to the reading material. For example, students could play a vocabulary-building game (Quizlet) or a comprehension quiz (Kahoot) to reinforce their understanding. Besides, students were asked to create video responses to their readings, discuss themes or characters. These were shared in class to promote further discussion. During the class, students took turns reading sections of the text aloud and summarized what they had read. They chose characters from the reading and acted out scenes.

In traditional classes, the students followed the conventional routines of the institute which was the common instruction and practice in class and there was only homework. For speaking class, the teachers assigned and introduced some topics for students to research and present to the class, focusing on organization, clarity, and engagement. Similarly, in reading class, teacher-centered instruction was applied to systematically build foundational reading skills. The instructors, read texts to the students, focused on the meaning of words and the comprehension of texts. Students then completed exercises and worksheets to practice reading skills and reinforce vocabulary and comprehension through repetition.

After the experiment, the students completed a post-test to evaluate whether and to what extent flipped instruction has impacted the experimental group's speaking and reading skill.

## DATA ANALYSIS

Quantitative methods were used to evaluate the students' scores in tests. The data obtained from the scores of pre-tests and post-test were analyzed through the Statistical Package for Social Sciences (SPSS). An independent samples t-test was used to compare the results of the control and experimental groups. This test was used since the groups



were normally distributed. The final results are shown in the tables and their interpretation provided.

### Reliability Statistics

As Table 1 shows, the reliability index for the Nelson test consisting of 50 items was assessed at 0.91 using KR-21. Moreover, the reliability values for the pre- and post-Speaking-Test were assessed to be 0.82 and 0.83 respectively using the Pearson correlation coefficient (inter-rater reliability). In addition, the reliability values for pre and post reading tests were assessed at 0.85 and 0.86 respectively using Pearson correlation coefficient (inter-rater reliability). Therefore, all three instrument used in this study have acceptable reliability index.

**Table 1.** Reliability Statistics of the Instruments

Instruments	No. of items	Reliability Method	Reliability Index
Nelson Test	50	KR-21	0.91
Speaking Test (Pretest)	25	Cronbach's Alpha	0.82
Speaking Test (Posttest)	25	Cronbach's Alpha	0.83
Reading Test (Pretest)	20	Cronbach's Alpha	0.85
Reading Test (Posttest)	20	Cronbach's Alpha	0.86

As mentioned, the researchers applied convenience sampling in the present study, thus the Nelson test was given to both experimental and control groups to check whether both groups were homogeneous regarding English language proficiency or not. Table 2 manifests the results of descriptive statistics for both groups' Nelson scores.

**Table 2.** Descriptive Statistics and Normality Test of the Two Groups' Nelson Scores (N = 50)

Group	Mean	SD	Skewnes s	Std. Error	Skewnes s Ratio	Kurtosi s	Std. Error	Kurtosis Ratio
Experimental	31.43	5.237	.343	.427	0.803	-.324	.833	-0.388
Control	30.67	4.787	-.121	.427	-0.283	-.467	.833	-0.560

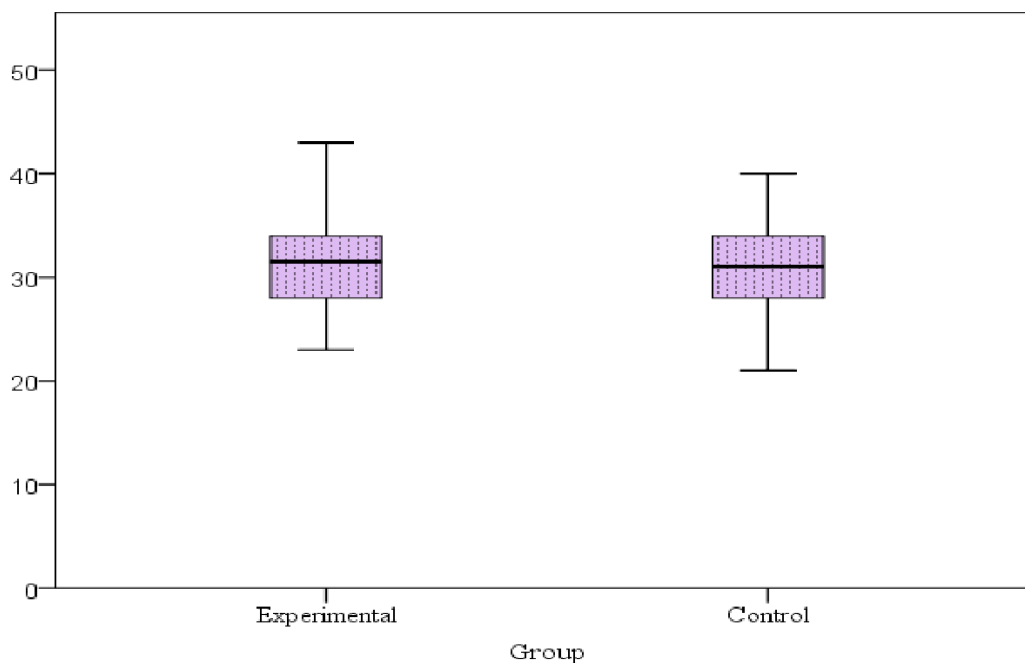


Table 2 shows the mean score and standard deviation for the experimental group ( $\bar{x} = 31.43$ ,  $SD = 5.23$ ) and the control group ( $\bar{x} = 30.67$ ,  $SD = 4.78$ ). Moreover, Table 2 notifies that the Nelson scores for both experimental and control groups have normal distribution, as the skewness ratios of the two groups' scores over their respective standard errors do not go beyond the ranges of +/- 1.96. An independent sample *t*-test was performed to compare the Nelson scores of both experimental and control groups (Table 3).

**Table 3.** Independent Samples T-test for Two Groups' Nelson Homogeneity Test Scores

	Levene's Test for Variances		T-test for Means			
	<i>F</i>	<i>Sig.</i>	<i>T</i>	<i>Df</i>	<i>Sig.</i> (2-tailed)	Mean Diff.
Equal variances assumed	.130	.720	.592	58	.556	.767
Equal variances not assumed			.592	57.539	.556	.767

Table 3 indicates that the hypothesis of equality of variances is confirmed, as the significance level of .72 from Levene's test exceeds the selected significance level of .05 for this study. On the basis of the results in Table 3, an independent sample *t*-test failed to find any statistically significant difference ( $t(58) = .59$ ,  $p = .55$ ,  $p > .05$ ) in the Nelson measures for the experimental ( $\bar{x} = 31.43$ ) and control ( $\bar{x} = 30.67$ ) groups, in which the *t*-observed is lower than the *t*-critical of 2.00. That means the students in the experimental and control groups have very similar levels of English language proficiency. Figure 2 depicts the English Nelson results for both groups. The figure demonstrates the students' performance on the Nelson test was nearly identical for the two groups.



**Figure 2.** Two groups' Nelson test means

### **Investigation: First Research Question**

The purpose of the first research question was to find out whether and to what extent flipped instruction affects reading comprehension of Iranian EFL learners. The researcher conducts an independent sample *t*-test for investigating this research question.

The assumptions of interval data, independence of subjects, normality and homogeneity of variances were met before the researcher applied parametric tests (independent samples and paired-samples *t*-tests). The first assumption was not violated because the present data were measured on an interval scale. Further, the assumption of independence of subjects is satisfied as the performance of any given individual is independent of the performance of other individuals. Finally, the assumption of normal distribution of the data was checked using the one-sample Kolmogorov-Smirnov test (Table 4).



**Table 4.** One-Sample Kolmogorov-Smirnov Test of Normality for Reading Comprehension Scores

Time	Group	N	Kolmogorov-Smirnov Z	Sig. (2-tailed)
Pre-test	Experimental	25	.529	.921
	Control	25	.399	.967
Post-test	Experimental	25	.805	.536
	Control	25	.613	.844

According to Table 4, the two reading comprehension pre-test scores for both experimental group ( $p = .92, p > .05$ ) and control group ( $p = .96, p > .05$ ) have normal distribution. Moreover, the reading comprehension post-test scores for both experimental group ( $p = .53, p > .05$ ) and control group ( $p = .84, p > .05$ ) exhibit normal distribution. Hence, the researcher was justified to apply independent samples  $t$ -test and paired samples  $t$ -test as two parametric statistical tests in this study. The related descriptive statistics were prepared (Table 5) before discussing the  $t$ -test results.

**Table 5.** Descriptive Statistics of Two Group's Reading Comprehension Scores (Pre-test)

Group	$N$	Mean	$SD$	Std. Error Mean
Experimental	25	2.664	.323	.059
Control	25	2.594	.295	.053

As Table 5 represents, the mean and standard deviation of the experimental ( $\bar{x} = 2.66, SD = .32$ ) and control ( $\bar{x} = 2.59, SD = .29$ ) groups on the pre-tests of reading comprehension skill. Table 6 below demonstrates the independent  $t$ -test results comparing the experimental and control groups' reading comprehension skill scores on the pre-test.

**Table 6.** Independent Samples T-test for Reading Comprehension (Pre-test)

Levene's Test for Variances			T-test for Means			
Factor	<i>F</i>	<i>Sig.</i>	<i>T</i>	<i>Df</i>	<i>Sig.</i> (2-tailed)	Mean Diff.
Equal variances assumed	.950	.334	.871	58	.387	.069
Equal variances not assumed			.871	57.541	.387	.069

According to Table 6, the equality of variance assumption holds since the significance level (.33) for Leven's test is above .05. Also, the table indicates that there was no statistically significant difference ( $t(58) = .87, p = .38, p > .05$ ) in reading comprehension scores for experimental ( $\bar{x} = 2.66$ ) and control ( $\bar{x} = 2.59$ ) groups on the pre-test, in which the  $t$ -observed was less than the  $t$ -critical (2.00). So, the researcher came to the conclusion that the students in the two groups have the same level of reading comprehension at the outset of the study. In addition, the researcher performed another independent  $t$ -test (Table 7) to compare experimental and control groups' reading comprehension scores on the post-test.

**Table 7** Descriptive Statistics of Two Group's Reading Comprehension Scores (Post-test)

Group	<i>N</i>	Mean	<i>SD</i>	Std. Error Mean
Experimental	25	2.833	.215	.039
Control	25	2.643	.268	.049

Table 7 represents the mean and standard deviation of the experimental group ( $\bar{x} = 2.83, SD = .21$ ) and control group ( $\bar{x} = 2.64, SD = .26$ ) on the post-test of reading comprehension. According to Table 8 below, the significance level (.29) associated with Leven's test is less than .05, so the assumption of the equality of variance holds.



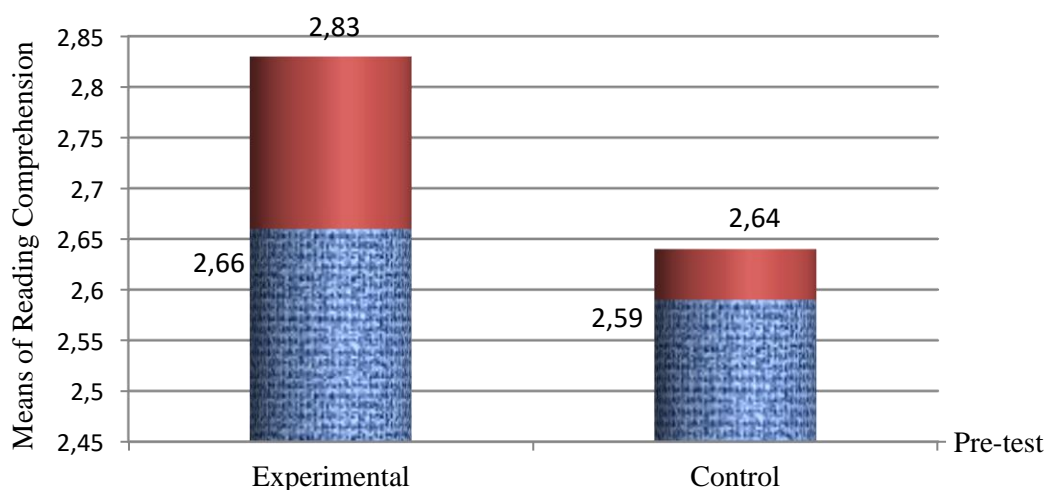


**Table 8.** Independent Samples T-test for Reading Comprehension (Post-test)

Levene's Test for Variances			T-test for Means			
Factor	<i>F</i>	<i>Sig.</i>	<i>T</i>	<i>Df</i>	<i>Sig.</i> (2-tailed)	Mean Diff.
Equal variances assumed	1.125	.293	3.035	58	.004	.19067
Equal variances not assumed			3.035	55.399	.004	.19067

As seen in Table 8 above, the independent *t*-tests found a statistically significant difference ( $t(58) = 3.03, p = .004, p < .05$ ) in reading comprehension scores for experimental ( $\bar{x} = 2.83$ ) and control ( $\bar{x} = 2.64$ ) groups on the post-test, in which the *t*-value of 3.03 is below the *t*-critical value of 2.00. Subsequently, the first null hypothesis of the study that says “Flipped instruction does not have an effect on reading comprehension of Iranian EFL learners” was rejected, and thus the researchers can claim that flipped instruction influences Iranian EFL learners' reading comprehension.

In order to show the results more clearly, the researchers draw a box plot (Figure 3). As the figure shows, the students in the experimental group have expressed extensively higher stage of English reading comprehension than those in the control group on the post-test in the condition that the two groups showed almost similar reading comprehension level at the onset of the course.



**Figure 3.** The two Groups' Means on Reading Comprehension (pre-test & post-test)



For further analysis, a paired samples  $t$ -test was run comparing the reading comprehension means on the pre-test and post-test in each group. The results are laid out in Table 9.

**Table 9** Paired Samples Test for Pre-test and Post-test of Reading Comprehension in Two Groups

Group	Gained Score	$SD$	95% Confidence Interval of the Difference		$t$	$Df$	Sig. (2-tailed)
			Lower	Upper			
Experimental	.169	.351	.038	.301	2.641	29	.013
Control	.048	.335	-.076	.174	.794	29	.434

Table 9 clarifies that paired samples  $t$ -test detected a statistically significant increase ( $t(29) = 2.64, p = .01, p < .05$ ) in reading comprehension scores from pre-test ( $\bar{x} = 2.66, SD = .32$ ) to post-test ( $\bar{x} = 2.83, SD = .21$ ) in the experimental group. Here, the gained score in reading comprehension was 0.16 (out of 4), with a 95% confidence interval ranging from 0.038 to 0.301." Inversely, the  $t$ -test failed to find any statistically significant increase ( $t(29) = .79, p = .43, p > .05$ ) in reading comprehension measures from the pre-test ( $\bar{x} = 2.59, SD = .29$ ) to post-test ( $\bar{x} = 2.64, SD = .26$ ) in the control group. In other words, here the gained score was only .05 (out of 4) with a 95% confidence interval ranging from -.076 to .174.

### Investigation: Second Research Question

The second research question of this study aimed at seeing if flipped instruction affects Iranian EFL learners' speaking skill. In order to investigate this research question, an independent sample  $t$ -test was conducted.



**Table 10.** One-Sample Kolmogorov-Smirnov Test of Normality for Speaking Skill Scores

Test	Group	<i>N</i>	Kolmogorov-Smirnov <i>Z</i>	Sig. (2-tailed)
Pre-test	Experimental	25	.690	.728
	Control	25	.698	.714
Post-test	Experimental	25	.505	.943
	Control	25	.692	.724

Table 10 shows that the two speaking skill pre-test scores for the experimental group ( $p = .72, p > .05$ ) and the control group ( $p = .71, p > .05$ ) are normally distributed. Besides, as observable in the table, the speaking skill post-test scores for both experimental group ( $p = .94, p > .05$ ) and control group ( $p = .72, p > .05$ ) have normal distribution. This legitimates utilizing the independent samples *t*-test and paired samples *t*-test as two parametric statistical tests.

Table 11 shows the mean and standard deviation of the experimental and control groups on pre-test of speaking skill.

**Table 11.** Descriptive Statistics of Two Group's Scores on the Speaking Pre-test

Group	<i>Time</i>	<i>N</i>	Mean	<i>SD</i>	Std. Error Mean
Experimental	Post-test	25	13.033	1.804	.329
	Pre-test	25	15.467	1.4735	.3521
Control	Post-test	25	12.650	1.468	.268
	Pre-test	25	14.267	1.5588	.2874



Table 12 below reflects the result of the independent *t*-test that was carried out to compare the speaking skill scores of experimental and control groups on the pre-test of speaking skill. As is evident from the table, the significance level (.17) associated with Levene's test was more than .05, implying that the assumption of equality of variance is met.

**Table 12** Independent Samples Test for Two Groups' Scores on Speaking Skill Pre-test

Levene's Test for Variances			T-test for Means			
Factor	<i>F</i>	<i>Sig.</i>	<i>t</i>	<i>df</i>	<i>Sig.</i> (2-tailed)	Mean Diff.
			Equal variances assumed	1.925	.171	.902
Equal variances not assumed			.902	55.703	.371	.383

As a glance at Table 12 shows, *t*-value and significance level ( $t(58) = .90, p = .37, p > .05$ ) are indicative of no significant difference in speaking scores for experimental ( $\bar{x} = 13.03$ ) and control ( $\bar{x} = 12.65$ ) groups on the pre-test. In fact, the *t*-observed value is below the *t*-critical value of 2.00; thus, the students in the two groups had approximately the same level of speaking skill at the beginning of the study.

Table 13 reflects the mean and standard deviation of the experimental ( $\bar{x} = 14.66, SD = 1.42$ ) and control ( $\bar{x} = 13.48, SD = 1.50$ ) groups on the post-test of speaking skill.

**Table 13** Descriptive Statistics of Two Group's Scores on the Speaking Skill Post-test

Group	<i>N</i>	Mean	<i>SD</i>	Std. Error Mean
Experimental	25	14.667	1.428	.260
Control	25	13.483	1.499	.273

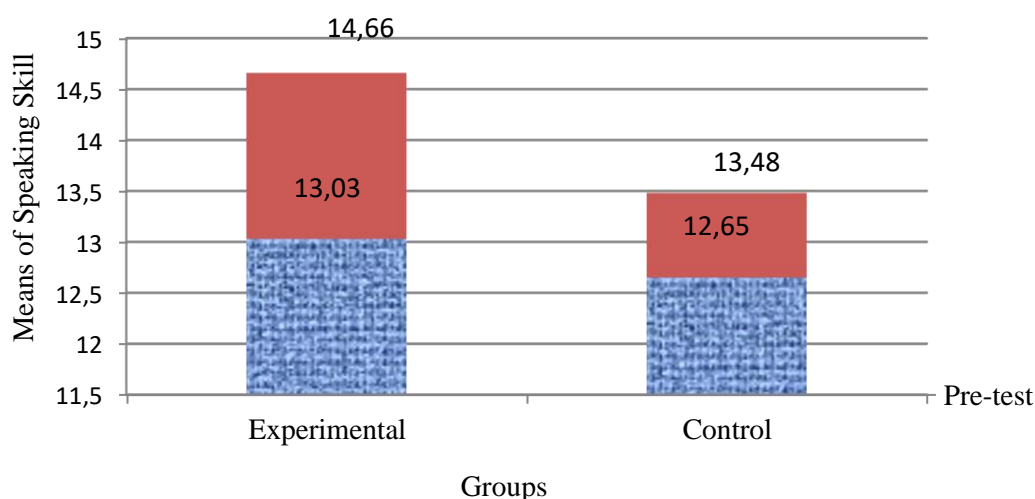
The results of the independent *t*-test that was performed to compare experimental and control groups' speaking skill scores on the post-test are set forth in Table 14.



**Table 14** Independent Samples Test for Two Groups' Scores on Speaking Skill Post-test

Levene's Test for Variances			T-test for Means			
Factor	<i>F</i>	Sig.	<i>T</i>	<i>Df</i>	Sig. (2-tailed)	Mean Diff.
Equal variances assumed	.006	.939	3.129	58	.003	1.183
Equal variances not assumed			3.129	57.862	.003	1.183

A cursory look at Table 14 indicates that the assumption of equality of variance holds ( $p = .93, p > .05$ ). Additionally, an independent  $t$ -test found a statistically significant difference ( $t(58) = 3.12, p = .003, p < .05$ ) in speaking skill measures for the experimental group ( $\bar{x} = 14.66$ ) and control group ( $\bar{x} = 13.48$ ). Also, the  $t$ -observed value was below the  $t$ -critical value of 2.00. Accordingly, the second null hypothesis was rejected that states, “Flipped instruction has no significant effect on developing Iranian EFL learners’ speaking skill” and thereby accepted that flipped instruction enhances Iranian EFL learners' speaking skill. A bar graph (Figure 4) was drawn to illustrate the results of both pre-test and post-test. Figure 4 shows that the experimental group’s average score in speaking skills is significantly higher than the control group’s one.



**Figure 4.** Mean Scores of the Two Groups on Speaking Skills (Pre-test and Post-test)



For more exploration, the researchers conducted a paired samples *t*-test (Table 15) comparing speaking skills on the pre-test and post-test in each group.

**Table 15** Paired Samples Test for Pre-test and Post-test of Speaking Skill in Two Groups

Group	Gained Score	SD	95% Confidence Interval of the Difference		<i>t</i>	<i>Df</i>	Sig. (2-tailed)
			Lower	Upper			
Experimental	1.633	1.580	1.043	2.223	5.659	29	.000
Control	.833	1.713	.193	1.473	2.663	29	.012

As observable in Table 15, the paired samples *t*-test detected a statistically significant increase ( $t(29) = 5.65, p = .000, p < .05$ ) in speaking skill scores from pre-test ( $\bar{x} = 13.03, SD = 1.80$ ) to post-test ( $\bar{x} = 14.66, SD = 1.42$ ) in the experimental group. The gained score in speaking skill scores was 1.63 (out of 20) with a 95% confidence interval ranging from 1.043 to 2.223. Also, as it is evident from Table 15, *t*-test results indicated that there is a statistically significant increase ( $t(29) = 2.66, p = .01, p < .05$ ) in speaking skill scores from pre-test ( $\bar{x} = 12.65, SD = 1.46$ ) to post-test ( $\bar{x} = 13.48, SD = 1.50$ ) in the control group as well. In fact, the gained score was .83 (out of 20) with a 95% confidence interval ranging from .193 to 1.473. Generally, the two groups promoted the development of speaking skill, however, the gained score in the experimental group (1.63/20) was considerably higher than in the control group (.83/20).

## DISCUSSION

The obtained results reveal that flipped instruction enhances EFL learners' reading comprehension and speaking skill. Based on the evidence presented in the tables, the experimental group in reading had a pre-test and post-test score of (2.6<2.8) as shown in Figure 3. Regarding speaking skills, also, there was a significant increase in the score (13.03<14.66) as shown in Figure 4, it also became evident that the observed improvement was greater in speaking skills than reading.

In contrast to Al-Ghamdi and Al-Bargi's (2017) study which asserted flipped classrooms had no significant effect on the speaking of EFL Saudi learners, we found that FCM affects students' speaking fluency. Thus, the findings support the investigations of Murad (2009), Yeşilçınar (2019), and Shirvani et al., (2022) which claimed that FCM improves English learners' speaking ability and their attitudes towards learning English. Thus language teachers can employ different types of strategy in their teaching of speaking skills. In fact, teachers need to be aware of different learning preferences and move from their current teaching methods towards more student-centered methods. By





shifting students from passive to active learning, flipped learning provides opportunities for developing speaking skill since it affords more opportunities for communicative exercises among learners or between educator and learners. Also, class time can be utilized more fruitfully and inventively (Teng, 2018; Fulton, 2012). Regarding reading ability, the findings corroborate some studies (Sae-Ong, 2010; Hashemifardnia et al., 2018; Zarinfard et al., 2020) in that using flipped learning improved students' reading and comprehension skills. At the same time, this method was more suitable for strengthening reading skills and understanding the general content and meaning of texts, with less focus on smaller reading units such as vocabulary and grammar. The learners were able to effortlessly grasp the theme of the reading which includes recognizing the subject, key concept, and supporting details.

By utilizing technologies such as video calls, games, and recorded videos, the flipped classroom method can enhance understanding and engagement. These technologies also provide opportunities for practice and real-time feedback, which can be helpful for the development of skills such as speaking. Making it easier to express oneself, video calls may reduce anxiety in learners compared to in-person interactions. Applying these technologies also makes learners more autonomous or independent because they study learning topics before coming to class.

Since flipped instruction appeals to students' curiosity, it encourages activity. Furthermore, students are taught critical thinking, team work, communication skills, creative and also innovative thinking (Arif Rahman Hakim et al, 2023). Flipped learning allows teachers and students to explore the deeper knowledge dimensions inside the classroom, because the basic knowledge a student needs is already reached in anticipation of the in-class face-to-face session. Therefore, technologies like visual learning and online games can aid understanding and retention and motivate individuals to read more by introducing them to new topics or genres. They prompt students to engage with various texts or quizzes which can enhance comprehension. Overall, this research affirms that the flipped classroom is based on the constructivist model in which learning is an active and social process.

The main objective of this study was to investigate developing reading comprehension and speaking skills through flipped instruction on Iranian intermediate EFL learners. The findings proved the positive influence of flipped instruction on reading and speaking ability. Our research has two specific limitations as well as two related research suggestions for future work. The first limitation of the study was the small number of participants at hand for conducting the study. The rigorous control of homogeneity so as to achieve significance does not fully compensate when it comes to generalizability from small samples of participants. The second limitation was the choice of female participants only. Since there were not enough male students to create a balance between genders, the researchers chose females only. This limitation can influence the result and restrict generalizability as well. Further studies need to be conducted with larger sample sizes and gender distributions in different educational settings.



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