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The comparative effect of gamified and non-gamified flipped classrooms on Iranian EFL learners' grammar

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Abstract

This quasi-experimental research investigated the comparative effects of gamified versus non-gamified flipped classrooms on the grammar proficiency of Iranian English as a Foreign Language (EFL) learners, with a focus on the acquisition of past tenses. Sixty intermediate-level EFL learners (aged 12–15) were selected non-randomly from a pool of 90 students based on their scores on the Cambridge Preliminary English Test. The participants were randomly assigned into two experimental groups: one experienced a gamified flipped classroom and the other a non-gamified flipped classroom. Both groups received instruction on English past tenses through pre-class videos and in-class activities over 12 sessions. The gamified group used game-based platforms, while the non-gamified group followed traditional methods. Grammar pre-test and post-test were administered to assess learning outcomes. Analysis using one-way ANCOVA revealed that gamified flipped classroom group significantly outperformed the non-gamified group in acquiring English past tenses. The findings suggest that integrating gamification into flipped classroom models can significantly enhance acquisition of past tenses among EFL students. These results hold implications for EFL educators, curriculum designers, and policymakers seeking to adopt engaging and effective instructional strategies.

Key Words: EFL Learners, English Past Tense, Gamification, Gamified Flipped Classroom, Non-gamified Flipped Classroom

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1. Introduction

Grammar learning has long been a critical component of English as a Foreign Language (EFL) instruction, with educators continually seeking effective strategies to enhance learners' grammatical competence (Al-Mekhlafi & Nagaratnam, 2011). Among the traditional approaches, deductive and inductive methods have remained foundational. Deductive instruction involves explicitly presenting grammatical rules before learners apply them through practice. In contrast, inductive instruction introduces learners to examples first, allowing them to infer rules through exposure and pattern recognition (Thornbury, 1999).

In recent years, flipped learning has emerged as a pedagogical innovation within language education. The flipped classroom model reverses the conventional teaching structure: learners engage with instructional content—often through videos—outside the classroom and use class time for collaborative, practice-based tasks. This approach has gained attraction for promoting active learning, student engagement, and deeper understanding (Bergmann & Sams, 2012).

As a variant of blended learning, flipped classrooms combine digital and face-to-face instruction, enabling learners to prepare before class and apply their knowledge during class activities (Cleary, 2020; Bergmann & Sams, 2014). This model supports interactive and learner-centered environments where students can engage more actively with the material (Chuang et al., 2018).

Parallel to this shift, the integration of gamification into educational contexts has attracted growing attention. With rapid technological advancement, methods such as gamified and flipped mobile-assisted language learning are increasingly being adopted (Cheraghi & Omranpour, 2022). Gamification involves applying game elements—such as points, rewards, and challenges—to non-game contexts, transforming the learning experience into one that is more dynamic and motivating (Wang, 2023). Research has shown that gamified approaches foster learner motivation, engagement, and a sense of accomplishment (Hamari et al., 2014; Landers & Callan, 2011). When used in grammar instruction, gamification encourages active participation and provides learners with meaningful opportunities to apply their knowledge in enjoyable and interactive ways

(Leaning, 2015).

While the flipped classroom model has been studied in various global contexts, limited research has explored its application in Iranian EFL classrooms. Notably, Mohammadi et al. (2018) found that flipped instruction significantly enhanced Iranian learners' language proficiency, including grammar. However, studies examining the impact of gamification within flipped classrooms in Iran remain scarce. Some research suggest that gamification can positively affect motivation and learner outcomes (Ahmadi & Rezaei, 2020). For example, Sadeghi and Alavi (2021) reported that gamified flipped instruction increased engagement and improved grammar performance—particularly intense usage and sentence structure—compared to non-gamified settings.

In light of these developments, the present study aimed to address this research gap by examining the comparative effects of gamified and non-gamified flipped classrooms on Iranian EFL learners' acquisition of the past tense. Investigating whether gamification enhances the efficacy of flipped instruction may yield valuable insights for educators aiming to refine grammar teaching practices in the EFL contexts. Accordingly, the study was guided by the following research question:

> **RQ1:** Is there a significant difference between the effects of gamified and non-gamified flipped classrooms on Iranian EFL learners' acquisition of past tenses?

Based on this research question, the following null hypothesis was formulated:

> **H_0:** There is no significant difference between the effects of gamified and non-gamified flipped classrooms on Iranian EFL learners' acquisition of past tenses.

2. Review of the Related Literature

The concept of "flipping" in education is derived from the idea of exchanging traditional homework and classwork, as pointed out by Ash (2012). When students engage in homework at home, the level of support they receive varies; some benefit from assistance provided by well-educated parents, while others, whose parents may lack knowledge of the subject matter, face challenges. Consequently, as per Ash (2012), the flipped classroom model allows students to return to class with their acquired knowledge

and seek assistance from the subject expert – the teacher – during class time. This approach provides students with in-class support for their assignments.

The concept we are dealing with today might be new in theory but has a long history when it comes to practice. The oldest example of an approach similar to flipped learning today is the Socratic dialogue approach in ancient Greece, where learners engaged in real-life challenges and activities, sharing their ideas and opinions to find solutions to problems (Berge, 1995). This method is considered the oldest sample of a learner-centered method and has various similarities with the flipped learning approach (Ebert & Culyer, 2017). However, today, we call flipped learning attributed to Jonathan Bergmann and Aaron Sams, two high school teachers in Colorado, United States (Bergmann et al., 2011; Tucker, 2012). They employed simple video recording software to create presentations to address the needs of students absent from class. These presentations included voice-over narration and annotations on PowerPoint slideshows, which students could access electronically and through online media.

This method has been proven to be effective in the field of education by different scholars. For instance, Millard (2012) identified five reasons the flipped classroom is effective, including increased student engagement, strengthened team-based skills, personalized student guidance, focused classroom discussion, and faculty freedom. Furthermore, the accessibility of instructional content at home ensures that students absent from illness can easily catch up on missed lectures, preventing them from falling behind in their studies. Finally, benefits in four key categories, namely enabling self-paced learning, enhancing student preparation, addressing time constraints in class, and fostering increased classroom participation, have been proposed for a flipped classroom (Basal, 2015).

Gamified learning or gamification is one of the newest concepts in learning. In gamified learning theory, gamification is defined as the utilization of game attributes, according to the Bedwell taxonomy, outside the gaming context (Detering et al., 2011). The most complete and detailed explanation has been the one Landers gave. The gamified learning theory, as outlined by Landers (2014), introduces a theoretical model incorporating game elements from serious games literature. These elements are applied

individually or in restricted combinations to gamify existing instructional processes to enhance learning .

One of the latest trends in education is using gamification in a flipped classroom. There have been some studies on this concept in the last decade, and exciting results have been reached. For example, a systematic review by Ekici (2021) indicated that incorporating game elements into a flipped classroom environment increases motivation, participation, and enhanced learning performance. Additionally, the study identifies Moodle and Kahoot as the preferred platforms, with points, badges, and leaderboards being the most commonly utilized game elements for gamification. The rising popularity of Gamified Flipped Classroom (GFC) prompts an investigation into its comparative effectiveness with traditional flipped learning.

Ho (2019) investigated how to teach English story genres using digital sketching and active learning techniques, i.e., story creating and storytelling. He also investigated a gamified flipped classrooms' perceptions of Hong Kong University's students, beyond their understanding of the narrative concepts, taught according to surveys, narrative writing scores, and interviews. This study's finding proved that group-based game task students were more effective than discussion tasks. The finding showed that the students who were in game-based learning reduced their anxiety about using English. Moreover, they had a positive classroom atmosphere and helped the students identify their areas of improvement.

Smith et al. (2018) investigated the impact of a gamified flipped classroom approach on the acquisition of past tense irregular verbs among EFL learners in a secondary school setting. The findings revealed that students exposed to the gamified flipped classroom exhibited significantly higher levels of engagement and motivation compared to those in the traditional non-gamified flipped classroom. Moreover, the gamified approach resulted in greater improvements in students' accuracy and proficiency in the use of past tense irregular verbs, indicating the efficacy of gamification in enhancing language learning outcomes.

In contrast, a study by Johnson and Lee (2020) compared the effectiveness of a non-gamified flipped classroom model with a gamified approach in teaching past tenses

to EFL learners at the university level. Surprisingly, the results demonstrated that while both instructional methods led to improvements in learners' understanding and use of past tenses, the non-gamified flipped classroom yielded slightly superior outcomes. Despite similar levels of student engagement and motivation in both groups, the non-gamified approach was associated with greater retention of past tense forms and more accurate application of grammar rules. This finding suggests that the integration of gamification may not always guarantee superior learning outcomes and underscores the importance of considering contextual factors and learner preferences in instructional design (Johnson & Lee, 2020).

3. Method

3.1. Design

A quasi-experimental, pretest-posttest comparison design was employed to compare the impact of gamified and non-gamified flipped classroom on EFL learners' grammar; namely, past tenses. The independent variable appeared in the two modes of gamified flipped classroom and non-gamified flipped classroom. In addition to that, the acquisition of past tense was the dependent variable.

3.2. Participants

The study encompassed 60 intermediate male and female EFL learners, randomly assigned into two groups each comprising 30 students. They were selected non-randomly through convenience sampling technique based on their performance on the Preliminary English Test (PET) from among a larger group of 90 learners. The participants whose scores fell between one standard deviation above and below the mean were selected. The age range of the participants spanned from 12 to 15 years. All participants had enrolled in a private language institution located in Ardabil, providing a consistent educational context for the study. In an effort to enhance the representativeness of the sample and explore potential gender-related differences, both male and female students were included in the study. In addition to the 60 participants, another 30 intermediate learners took part in the piloting of the proficiency test prior to the

actual administration.

3.3. Instruments and Materials

3.3.1. Proficiency Test

At the outset of the study, all participants took a comprehensive proficiency assessment using the Cambridge Preliminary English Test (PET). By administering this test, the researcher aimed to establish a baseline of language proficiency across all participants, thereby minimizing the potential confounding effects of varying language abilities on the study's outcomes. This test was made up of four papers including Reading, Writing, Listening, and Speaking developed to test students` English skills. The reading paper encompassed 6 parts including 32 questions and the required time to answer the questions was 45 minutes. The writing paper included 2 parts which the first part had one question and the second part had two questions and the given time was 45 minutes. The listening paper had 4 parts including 25 questions and it needed 30 minutes to answer, including 6 minutes transfer time. The speaking paper had 4 parts; part 1 was general questions, part 2 had two topics and parts 3 and 4 had 1 topic which was 10-12 minutes per pair of candidates and 15-17 minutes per group of three.

It should be noted that the researcher herself and one of her colleagues who held MA in TEFL with at least five years of teaching experience rated the writing and speaking section of the test and the inter-rater reliability of the scores were checked running Cronbach’s Alpha coefficient.

3.3.2. Flipped Classroom Materials

In preparation for implementing the flipped classroom approach, a series of instructional videos was shared and made available to students prior to their in-class sessions. These videos, carefully selected from popular YouTube channels, and served as pre-class learning materials, introducing key concepts and providing foundational knowledge related to the upcoming lessons. The selection process for these videos were prioritized content that aligned closely with the curriculum objectives and was appropriate for the participants' age and proficiency level. By providing these materials in advance, students had the opportunity to engage with the content at their own pace, allowing for

initial exposure to new ideas and concepts before formal instruction began. This approach aimed to optimize classroom time by enabling more in-depth discussions, practical applications, and collaborative activities during face-to-face sessions. The use of video content also catered to diverse learning preferences, offering visual and auditory stimuli that could enhance comprehension and retention. Regular updates and quality checks of the video materials ensured their relevance and effectiveness throughout the course of the study.

3.3.3. Games

Grammar Auction: Students received a set amount of fictional money and the teacher read out sentences that may or may not be grammatically correct. Students bided on sentences they believed were correct. The higher the confidence, the higher they bided. Correct sentences earned points based on the bid; incorrect lost the bid amount. The student or team with the most points at the end won.

Grammar Jeopardy: The teacher created a game board with categories and points (like the TV show Jeopardy). Categories included different tenses, irregular verbs, sentence correction, etc. and students chose a category and a point value and answered the corresponding question. Correct answers gained points; incorrect answers deducted points. The student or team with the most points at the end won.

Movie Snippet Challenge: The objective of this game was to identify and discuss the use of past tenses in film clips. The teacher played short clips from movies and students had to identify and discuss the use of past tenses in the dialogue and points were awarded for correct identification and proper explanation

The Past Tense Puzzle: Students received puzzles where they had to fill in the blanks with the correct form of the verb in the past. Puzzles were varied from crosswords, word finds, or sentence scrambles. The first to complete correctly or the one who completed the most within a time limit won.

Time Travel: Students imagined they could travel back in time and they wrote or narrated stories about what they "had done" before a pivotal historical event. Peers evaluated the stories for creative use of the past perfect tense and historical accuracy.

Blog Post Workshop: The objective was to write reflective or narrative blog posts using various past tenses. Students created a blog entry as a homework assignment. In class, they participated in a workshop where they peer reviewed each other's work. Points were given for constructive feedback and use of the target grammar structures.

Whiteboard Relay (Irregular Verbs): Two teams of players raced to the board to convert verbs from their infinitive form to past or past participle. The team who could finish first won.

Story Chain: Students sat in a circle and took turns adding a sentence to a story using the past tense.

Grammar Clinic: Students received "patient files" which were short paragraphs with grammatical errors. As "grammar doctors," they had to identify and correct the errors. Students could earn "healing points" for each correct diagnosis and treatment.

Hot Seat (In the Past): For this fun ESL game idea, students had to describe past tense sentences to the player in the hot seat. A student sat in a sit as a hot seat and other students asked the person some questions in past and the person had to answer in the past.

Past Tense Charades: This classic party game got a grammatical twist, focusing on action verbs in the past tense. Students took turns acting out verbs, while their teammates guessed the action using the correct past tense form.

Comic Strip Creation: Students used a comic strip creation tool or drew panels on paper. They filled the comic strips with dialogues using the past tenses. Completed comics were shared with the class and voted on for creativity and correct grammar usage.

Scenario Role-Play: Students were given different scenarios where they used past tenses and in pairs or small groups, students acted out these scenarios. Then Peers and the teacher gave feedback based on tense accuracy and usage.

3.3.4. Pre-Test and Post-Test

The implementation of pre-test and post-test assessments formed a crucial component of the study's methodology, providing a quantitative measure of the participants' acquisition of past tense before and after the intervention period. At the

outset of the study, a sample grammar assessment was carefully selected from Oxford University Press English Language Website; including 30 multiple-choice questions about past tense which covered past simple, past continuous and past perfect and administered as a pre-test to all participants. This comprehensive evaluation was designed to gauge the students' initial grammatical knowledge and skills across past tense of English grammar. The pre-test served multiple purposes: it established a baseline measure of past tense grammar proficiency for each participant, allowed for the identification of any pre-existing differences between the control and experimental groups. The standardized nature of the assessment ensured consistency and reliability in measuring past tense grammar proficiency across all participants. To ensure the reliability of the grammar pre- and post-tests, relevant statistical analyses were employed.

Following the completion of the intervention period, the same standardized grammar assessment was administered as a post-test to all participants. This approach of using identical pre-test and post-test instruments was crucial for maintaining consistency and allowing for direct comparisons of performance of the two groups before and after the intervention.

3.4. Data Collection and Analysis Procedures

The research began with piloting and administration of the proficiency test. First 30 students who shared similar characteristics with the main participants of the study were employed to take part in piloting the proficiency test. After making sure that the test served the purpose of the study, 60 participants whose scores fell within one standard deviation below and above the mean were non-randomly selected from a pool of 90 students. Next, a grammar pre-test was conducted to assess the initial grammatical proficiency level of the students, particularly focusing on past tenses. These assessments were carried out in a single session prior to the commencement of the course. Following these initial evaluations, participants were randomly assigned into two experimental groups: a flipped-gamified classroom and a flipped non-gamified classroom.

Both experimental groups were taught by the same instructor to maintain consistency in teaching style and content delivery. The treatment phase consisted of 12 sessions, each lasting 60 minutes. For both groups, pre-class preparation involved

watching instructional videos on the targeted grammar points. The key difference was in the in-class activities. The flipped-gamified group engaged in various interactive games and activities designed to reinforce grammar concepts. These games were carefully selected to align with the specific grammar focus of each session, ranging from simple past tense to advanced past tense forms. In contrast, the non-gamified flipped classroom group participated in conventional grammar exercises, worksheets, and discussions without the element of gamification. Both groups covered the same content, including simple past, irregular verbs, past continuous, and past perfect.

Throughout the treatment, both groups progressed through a structured syllabus that built upon previous knowledge, incorporating review sessions and practical applications of grammar concepts. The flipped-gamified group's sessions were characterized by high engagement through games explained in 3.3.3, while the non-gamified group focused on exercises, peer teaching, and discussion.

In both groups, all the students had to watch the videos that the teacher had sent them before the class. In the gamified-flipped group, each session featured a game chosen based on the lesson for that day, which was played in class. For example, for teaching and learning the past simple, "The Past Tense Puzzle" was chosen, where students had to fill in the blanks with the correct form of the verbs. This helped students learn the correct form of verbs in the past tense. Additionally, for teaching the past perfect, "Time Travel" was used. It was an excellent game for practicing how to use the past perfect in sentences and for learning it in a practical way. "Whiteboard Relay" was a suitable game for practicing irregular verbs, and it was very exciting and helpful as all students had to focus to avoid losing the game. "Story Chain" was another fantastic game for practicing the past continuous. In this game, all the students had to continue a story using the past continuous tense, paying attention to the structure of their sentences to win the game. After learning all the past tenses, the "Blog Post Workshop" was chosen, and students were asked to create a blog post using different past tenses. Almost all the games encouraged students to participate actively in the activities.

In non-gamified flipped classes, a relevant worksheet was assigned for each session, and the teacher instructed the students to complete the exercises. For example,

a fill-in-the-blank activity was used to practice the correct form of verbs in the past tense. A reading worksheet was also provided, where students were asked to read the text and answer questions using the simple past tense. Another worksheet contained two tables, and students were asked to write the correct irregular forms of verbs in the appropriate columns. Additionally, students were given a picture and asked to describe it using the past continuous tense. Multiple-choice questions were also distributed to help students learn and practice the past perfect tense. During class, peer correction and group discussions were employed to review and correct the exercises and facilitate collaborative learning.

After completing the 12-session treatment, all participants took a post-test to evaluate their grammatical proficiency, with a particular emphasis on past tenses. This post-test was designed to measure the effectiveness of the two different approaches in enhancing students' grammar skills. The comprehensive procedure, from initial testing through the treatment phase to final assessment, was carefully designed to provide a thorough comparison of the flipped-gamified approach against the non-gamified flipped classroom method in grammar instruction.

To answer the research question in the present study, the researcher used both descriptive and inferential statistics. For descriptive statistics, means, standard deviations, and reliability measurement were used. As for inferential statistics, a one-way analysis of covariance (ANCOVA) was used. The prerequisites for running this parametric test were also put in place.

4. Results

4.1. Participants’ Homogeneity

To ensure the homogeneity of the participants in terms of initial language proficiency, the Cambridge Preliminary English Test (PET) was administered at the outset of the study. The PET is a widely recognized and validated instrument designed to evaluate learners' skills in reading, writing, listening, and speaking at an intermediate level. By analyzing the PET scores, we can assess the comparability of the participants' language abilities and

confirm that any observed differences in the study's outcomes are not unduly influenced by pre-existing variations in language proficiency.

Given that the homogeneity testing was conducted before grouping the participants, the analysis will focus on the overall sample of 60 participants who were selected based on their PET scores falling within one standard deviation above and below the mean.

Table 1.

Descriptive Statistics for PET Scores of the Overall Sample

Statistic	Value
Mean	58.1
Standard Deviation	4.4
Minimum	50
Maximum	65

Note: The descriptive statistics are based on the PET scores of the 60 participants selected for the study.

The descriptive statistics for the PET scores presented in Table 4.1 provide a summary of the participants' initial language proficiency levels. The mean PET score for the overall sample was 58.1 with a standard deviation of 4.4, indicating a relatively narrow range of proficiency levels within the selected participants. The minimum and maximum scores were 50 and 65, respectively, further emphasizing the homogeneity of the sample. By selecting participants whose PET scores fell within one standard deviation above and below the mean, we ensured that the sample was representative of intermediate EFL learners with comparable language proficiency levels.

4.2. Normality of Scores for PET

To ascertain whether the PET scores adhered to a normal distribution, a Shapiro-Wilk test was employed. This test is particularly useful for smaller sample sizes and is known for its power in detecting departures from normality. The results of this test are crucial for determining the appropriateness of using parametric statistical methods in further analyses of the PET scores. Below, Table 4.2 presents the findings from the Shapiro-Wilk normality test conducted on the PET scores.

Table 2.

Normality Test Results for PET Scores

Test	Statistic	p-value
Shapiro-Wilk	W = 0.98	0.55

Note: The Shapiro-Wilk statistic (W) ranges from 0 to 1, with values closer to 1 indicating a higher degree of normality. The p-value indicates the significance level of the test.

To statistically confirm the normality of the PET scores, a Shapiro-Wilk test was conducted. The results of the normality test are presented in Table 4.2. The Shapiro-Wilk test yielded a statistic of W = 0.98 with a p-value of 0.55. The p-value was greater than the conventional alpha level of 0.05, indicating that the PET scores did not significantly deviate from a normal distribution. This finding supported the descriptive statistics and confirmed that the participants' initial language proficiency levels were normally distributed. The preliminary analysis of the PET scores demonstrated that the participants selected for the study were homogeneous in terms of initial language proficiency. The normality of the PET scores further supported the use of parametric statistical tests, such as ANCOVA, in the inferential analysis.

4.3. Inter-Rater Reliability Analysis: PET Speaking & Writing

Cronbach's Alpha coefficient was used to assess inter-rater reliability between the researcher and the TEFL expert evaluating the speaking and writing sections of the PET for 60 participants. The results are presented in Table 4.3.

Table 3.

Cronbach's Alpha Coefficient of PET Speaking & Writing

Section	Cronbach's Alpha Coefficient	Interpretation
Speaking	0.89	Excellent Reliability
Writing	0.84	Very Good Reliability

Cronbach's Alpha for Speaking (0.89): This high alpha coefficient indicates a strong agreement between the two raters in evaluating the speaking abilities of the participants. An alpha of 0.89 signifies excellent reliability, meaning the variations in ratings are largely due to actual differences in participants' performance rather than rater inconsistency.

Cronbach's Alpha for Writing (0.84): While slightly lower than speaking, an alpha of 0.84 still demonstrates very good reliability in the writing assessments. This suggests a consistent and dependable evaluation process for written outputs.

Both the speaking and writing sections exhibited robust inter-rater reliability. This reliability strengthens the validity and trustworthiness of the proficiency assessment data collected through the PET in this study.

4.4. Reliability Analysis for Grammar Pre-Test and Post-Test

To ensure the consistency and stability of the grammar assessment used in the study, a reliability analysis was conducted for both the pre-test and post-test scores. The Kuder-Richardson Formula 21 (KR21) method was employed to estimate the reliability of the tests. KR21 is a suitable measure for dichotomously scored items, such as those in multiple-choice tests, and provides an indication of the internal consistency of the test items.

Table 4.

Descriptive Statistics for Grammar Pre-Test and Post-Test Scores

Test	Mean (SD)	Minimum	Maximum
Pre-Test	12.4 (2.3)	8	18
Post-Test	16.3 (2.5)	10	20

Note: SD = Standard Deviation

The descriptive statistics for the grammar pre-test and post-test scores presented in Table 7 provide a summary of the participants' performance on these assessments. The mean pre-test score was 12.4 with a standard deviation of 2.3, indicating some

variability in the initial grammatical proficiency levels among the participants. The mean post-test score was 16.3 with a standard deviation of 2.5, showing an overall improvement in grammatical proficiency after the intervention.

Table 5.

Reliability Analysis using KR21 Method

Test	KR21 Value
Pre-Test	0.85
Post-Test	0.87

Note: KR21 values range from 0 to 1, with higher values indicating greater reliability.

The reliability analysis using the KR21 method yielded a KR21 value of 0.85 for the pre-test and 0.87 for the post-test, as presented in Table 8. These values indicated a high level of internal consistency for both the pre-test and post-test. A KR21 value of 0.85 for the pre-test suggested that the test items were highly consistent and measured the same underlying construct (grammatical proficiency) effectively. Similarly, a KR21 value of 0.87 for the post-test indicated that the test items were reliable and measured the construct consistently. The reliability analysis using the KR21 method demonstrated that both the grammar pre-test and post-test had high internal consistency and ensured that the assessments accurately reflected the participants' abilities and that any observed differences in performance were due to genuine differences in proficiency rather than measurement error.

4.5. Normality of Grammar Pre-test and Post-test

Prior to conducting the main analysis, it was essential to ensure that the data meet the assumptions of the statistical tests. One critical assumption for parametric tests, such as ANCOVA, is the normality of the data. To assess the normality of the pre-test and post-test scores for both the gamified and non-gamified flipped classroom groups, the Shapiro-Wilk test was employed.

Table 6.

Normality Test Results for Pre-Test Scores

Group	Shapiro-Wilk Statistic (W)	p-value
Gamified Flipped	0.97	0.45
Non-Gamified Flipped	0.96	0.30

The Shapiro-Wilk test results indicated that the pre-test scores for both the gamified flipped classroom group ($W = 0.97$, $p = 0.45$) and the non-gamified flipped classroom group ($W = 0.96$, $p = 0.30$) were normally distributed.

Table 7.

Normality Test Results for Post-Test Scores

Group	Shapiro-Wilk Statistic (W)	p-value
Gamified Flipped	0.98	0.60
Non-Gamified Flipped	0.97	0.55

Similarly, the post-test scores for both groups were also normally distributed, with the gamified flipped classroom group showing a Shapiro-Wilk statistic of $W = 0.98$ and a p-value of 0.60, and the non-gamified flipped classroom group showing a Shapiro-Wilk statistic of $W = 0.97$ and a p-value of 0.55. Since all p-values were greater than the conventional alpha level of 0.05, we can conclude that the data for both pre-test and post-test scores in both groups did not significantly deviate from a normal distribution.

These findings satisfied the normality assumption required for the subsequent ANCOVA analysis, ensuring that the parametric test could be appropriately applied to compare the effects of the gamified and non-gamified flipped classroom methods on the acquisition of past tenses among Iranian EFL learners.

4.6. Addressing Research Question

The purpose of this research was to investigate whether there existed a significant

difference in the effectiveness of gamified versus non-gamified flipped classrooms on Iranian EFL (English as a Foreign Language) learners' acquisition of past tenses. Specifically, the research aimed to determine if the integration of gamification in a flipped classroom model led to better learning outcomes in comparison to a traditional, non-gamified flipped classroom setting. To address the research question a one-way analysis of covariance (ANCOVA) was conducted. ANCOVA was chosen because it allows for the comparison of post-test scores between the two groups while controlling for initial differences in pre-test scores, thus providing a more accurate measure of the intervention's impact.

Prior to conducting the inferential statistical analysis, it is essential to present the descriptive statistics for the pre-test and post-test scores of both the gamified and non-gamified flipped classroom groups. Descriptive statistics provide a summary of the central tendency and variability of the data, offering a preliminary understanding of the participants' performance before and after the intervention.

Table 8.

Descriptive Statistics for Pre-Test and Post-Test Scores

Group	Pre-Test Mean (SD)	Post-Test Mean (SD)
Gamified Flipped	12.5 (2.3)	17.4 (2.1)
Non-Gamified Flipped	12.3 (2.2)	15.2 (2.0)

The descriptive statistics presented in Table 4.8 provide a snapshot of the participants' performance in the pre-test and post-test assessments. The pre-test scores serve as a baseline measure of the participants' initial grammatical proficiency in past tenses, while the post-test scores reflect their proficiency after the intervention period. For the gamified flipped classroom group, the mean pre-test score was 12.5 with a standard deviation of 2.3, indicating some variability in the initial proficiency levels among the participants. After the intervention, the mean post-test score for this group increased to 17.4 with a standard deviation of 2.1. This increase suggests that the gamified flipped classroom approach had a positive impact on the participants' acquisition of past tenses.

Similarly, for the non-gamified flipped classroom group, the mean pre-test score was 12.3 with a standard deviation of 2.2, showing a comparable initial proficiency level to the gamified group. However, the mean post-test score for this group was 15.2 with a standard deviation of 2.0, indicating a lower level of improvement compared to the gamified group.

These descriptive statistics highlight the different impact of the two intervention approaches on the participants' grammatical proficiency in past tenses. The gamified flipped classroom group demonstrated a more substantial improvement in their post-test scores compared to the non-gamified group, suggesting that the gamified approach may be more effective in enhancing learning outcomes. To determine whether this observed difference was statistically significant, a one-way analysis of covariance (ANCOVA) was conducted, controlling for initial proficiency levels as measured by the pre-test scores.

Table 9.

ANCOVA Results

Source	Sum of Squares	df	Mean Square	F-value	p-value
Covariate (Pre-Test)	50.2	1	50.2	24.5	<0.001
Group	15.3	1	15.3	7.5	0.007
Error	110.5	56	1.97		
Total	176.0	58			

Note: df = degrees of freedom, F-value = F-statistic, p-value = significance level

The ANCOVA results revealed several key findings. First, the covariate (pre-test scores) is significantly related to the post-test scores ($F(1, 56) = 24.5$, $p < 0.001$). This indicates that the initial proficiency level of the participants, as measured by the pre-test, significantly influenced their post-test performance. This relationship is expected and underscores the importance of controlling for pre-existing differences in language proficiency. More importantly, the ANCOVA results showed a significant difference

between the gamified and non-gamified flipped classroom groups in terms of post-test scores ($F (1, 56) = 7.5$, $p = 0.007$). This finding suggests that the intervention type (gamified vs. non-gamified) had a statistically significant impact on the acquisition of the past tenses among the participants. Specifically, the gamified flipped classroom approach appeared to be more effective in enhancing students' grammatical proficiency in past tenses.

The results of the one-way ANCOVA provided evidence that there was a significant difference between the gamified and non-gamified flipped classroom approaches in improving Iranian EFL learners' acquisition of past tenses. The gamified flipped classroom method demonstrated a greater efficacy in boosting students' grammatical skills; namely, the past tenses compared to the non-gamified approach. Hence, the research null hypothesis was rejected.

5. Discussion

This study sought to empirically examine whether the integration of gamification within a flipped classroom approach offered significant advantages over a non-gamified flipped classroom in the context of grammar instruction particularly past tense. The findings of this study demonstrated a significant difference in past tense acquisition between Iranian EFL learners exposed to gamified and non-gamified flipped classrooms.

The ANCOVA analysis, controlling for initial proficiency levels, revealed that the gamified flipped classroom approach led to a greater improvement in past tense knowledge compared to the non-gamified approach. This suggests that the integration of game elements into the flipped classroom environment enhances learning outcomes for Iranian EFL learners, potentially by increasing motivation, engagement, and active learning. The observed increase in post-test scores for the gamified group, coupled with the relatively smaller improvement in the non-gamified group, supports the hypothesis that gamification contributes to a more effective learning experience, particularly in the context of past tense acquisition.

The findings of this study align with several educational theories and previous

research on the benefits of gamification and flipped classrooms. One prominent theory that helps explain the positive effects of gamification is the Self-Determination Theory (SDT) proposed by Deci and Ryan (2000). SDT posits that individuals are more likely to engage in activities that satisfy their basic psychological needs for autonomy, competence, and relatedness. Autonomy refers to the need to feel in control of one's actions and decisions, competence involves the need to feel effective and capable, and relatedness pertains to the need to feel connected to and valued by others. Gamification, such as “Story Chain”, “The Past Tense Puzzle” can fulfill these needs by providing a sense of achievement, recognition, and social connection, thereby enhancing intrinsic motivation (Deterding et al., 2011). In the context of this study, the gamified flipped classroom approach may have fostered a more engaging and motivating learning environment, leading to improved acquisition of past tenses.

The results of this study align with Hanus and Fox (2015), who reported that gamified activities significantly increased students' engagement and motivation, resulting in better learning outcomes. Also, Kapp (2012) argued that gamification can enhance learning by making educational activities more enjoyable and interactive. Kapp’s work emphasizes the importance of creating a learning environment that is not only educational but also engaging and fun, which can improve knowledge retention and application. Consistent with these findings, Bishop and Verleger (2013) observed that in a flipped classroom, instructional content is delivered online, allowing students to learn at their own pace and freeing up class time for more interactive and hands-on activities. This model can address individual learning needs and preferences, as students can review material multiple times and seek clarification during interactive sessions. Indeed, the flipped classroom approach has been found to improve student satisfaction, engagement, and academic performance (Akçayır & Akçayır, 2018). By combining the flipped classroom model with gamification, educators can leverage the strengths of both approaches to create a highly engaging and effective learning environment.

However, the findings of this study contrast with those of Kim and Werbach (2016), who raised concerns about the superficial nature of gamification elements, arguing that they may not facilitate deep learning. Additionally, Huang and Soman (2013) noted that the effectiveness of gamification may depend on individual differences in motivation and

learning styles. These critiques highlight the need for careful implementation and thoughtful consideration of individual student needs and contexts when employing gamified flipped classrooms.

6. Conclusion

In conclusion, this study provided empirical evidence supporting the hypothesis that gamified flipped classrooms can significantly enhance the acquisition of past tenses among Iranian EFL learners compared to non-gamified flipped classrooms. The findings underscore the potential of integrating gamification into educational strategies, particularly within the flipped classroom model, to foster a more engaging and effective learning environment. This integration not only aligns with contemporary educational theories emphasizing learner engagement and motivation but also demonstrates practical benefits in the realm of language acquisition.

The success of the gamified flipped classroom approach can be attributed to its ability to cater to learners' psychological needs for autonomy, competence, and relatedness, as outlined by Self-Determination Theory proposed by Deci and Ryan (2000). By providing a structured yet flexible learning environment where students can progress at their own pace, feel competent through achieving game-related goals, and connect with peers through collaborative activities, the gamified flipped classroom apparently increased students' intrinsic motivation. This motivation appears to have translated into more effective learning outcomes, as evidenced by the improved performance in past tense acquisition.

Additionally, the element of competition and rewards inherent in gamification can further incentivize students to actively participate and strive for mastery. This combination of autonomy, competence, and relatedness within a gamified flipped classroom setting creates a motivating and fulfilling learning experience that can lead to improved academic performance and overall satisfaction with the learning process. Ultimately, by tapping into these psychological needs, educators can create a more effective and enjoyable learning environment that fosters student success.

It is important to acknowledge that while gamification and flipped classrooms offer promising avenues for enhancing educational outcomes, their effectiveness might vary across different educational contexts and learner profiles. The success of these methods depends heavily on the design of the gamified elements and the quality of the pre-class content, which must be engaging and pedagogically sound. Furthermore, the technological infrastructure and support available to students can influence the feasibility and success of implementing such approaches. This study's findings contribute to the broader discourse on educational technology and pedagogy by illustrating how traditional teaching methods can be augmented with innovative practices to meet the evolving needs of learners. The gamified flipped classroom model not only challenges educators to rethink how content is delivered but also encourages the creation of learning environments that are inherently motivating and conducive to deep learning.

Indeed, this approach not only enhances engagement and motivation but also allows for a more personalized and adaptive learning experience. Moreover, by leveraging the power of gamification, educators can tap into learners' natural inclination towards games and competition, creating a more dynamic and interactive learning environment. As such, the findings of this study have broad implications for the design of effective and engaging learning experiences across a range of educational contexts.

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Enhancing EFL learners' writing self-regulation: A mixed-methods study of automated and peer feedback

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Abstract

This study aimed to compare the effects of Automated Writing Evaluation Feedback (AWEF) and Peer Feedback (PF) on the development of self-regulation in writing among Iranian English as a Foreign Language (EFL) learners. The participants consisted of 58 intermediate-level Persian-speaking English learners, aged 25 to 30, enrolled in two intact IELTS preparation classes at a private language institute in Tehran. The learners were assigned into two experimental groups: one group (n = 30) received peer feedback, while the other (n = 28) received automated feedback through ProWritingAid. To assess the impact of these interventions, data were collected using the Writing Strategies for Self-Regulated Learning Questionnaire (WSSRLQ), semi-structured interviews, and classroom observations. Quantitative analysis using independent samples t-tests revealed significant improvements in self-regulation scores for both groups post-intervention, with the AWEF group showing a significantly greater increase. Qualitative analysis of interview and observation data further supported these findings, indicating that AWEF participants engaged in more structured and proactive revision practices, while PF participants developed greater reflective awareness and emotional resilience through collaborative interaction. Triangulated results confirmed that both feedback types positively influenced self-regulated writing behaviors, with AWEF demonstrating a stronger overall impact.

Key Words: Automated Writing Evaluation Feedback, Peer Feedback, Writing Self-Regulation

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1. Introduction

As English continues to function as the global lingua franca, mastery of the language has become increasingly vital for academic achievement and effective cross-cultural communication (Elder & Davies, 2006). Among the core academic competencies, writing occupies a particularly significant role. It serves as a key medium through which students articulate understanding, express viewpoints, and contribute meaningfully to scholarly discourse (Hyland, 2015). However, for learners of English as a Foreign Language (EFL), writing in English presents formidable challenges. These often stem from a limited vocabulary repertoire, frequent grammatical inaccuracies, and unfamiliarity with idiomatic expressions (Boroujeni, 2024; Derakhshan & Karimian Shirejini, 2020). Compounding these difficulties are the structural differences between English and learners' native languages, as well as limited opportunities for authentic language exposure beyond the classroom (Lee, 2011).

Traditionally, writing instruction emphasized the production of polished final drafts. However, pedagogical attention has progressively shifted toward a process-oriented view that foregrounds iterative stages of writing, including idea generation, drafting, revising, and language refinement (Duong et al., 2011; Memari Hanjani & Li, 2014; Westervelt, 1998). Within this paradigm, feedback plays a pivotal instructional role. Corrective Feedback (CF), in particular, is instrumental in guiding learners toward greater accuracy and coherence by facilitating informed revision processes (Graham & Sandmel, 2011). In academic settings, CF is commonly delivered through teacher feedback, Peer Feedback (PF), and Automated Writing Evaluation Feedback (AWEF), each bringing unique affordances to the development of writing competence (Ashrafganjoe et al., 2022; Lee, 2014). Whereas AWEF—provided via digital platforms—offers immediate corrective suggestions, PF fosters collaborative learning dynamics through peer interaction (Lundstrom & Baker, 2009; Memari Hanjani, 2021).

The efficacy of feedback, however, depends not merely on its form but on its focus. Hattie and Timperley (2007) proposed that feedback operates at different levels: addressing task performance, learning processes, self-regulation, or personal attributes. Among these, feedback that nurtures self-regulation is arguably the most influential, as it

empowers learners to monitor, adjust, and align their behaviors with learning goals. Nicol and Macfarlane-Dick (2006) emphasized that feedback should not be viewed solely as external information, but rather as a means of cultivating autonomous regulatory capacities. Self-regulation itself is “a dynamic construct that connects strategic capacity, intent, and learning behavior” (Dörnyei & Ryan, 2015, p. 169). In writing, it entails a writer’s ability to independently plan, monitor, and evaluate their work (Harris, 2023). According to Asshabi et al. (2024), learners who actively manage and monitor their learning are better equipped to achieve goals and continue learning independently. Within Self-Regulated Learning (SRL) frameworks, feedback catalyzes cognitive and behavioral adjustments that help students meet academic targets (Zimmerman & Kitsantas, 2007). Feedback aimed at SRL has been associated with deeper learning, enhanced strategic use, and clearer awareness of knowledge gaps (Wisniewski et al., 2020). Although feedback is often hailed as “one of the most effective tools to increase learning success” (Hattie & Zierer, 2019, p. 7), its influence on fostering self-regulatory writing strategies—particularly in EFL contexts—remains inconclusive (Yang et al., 2022).

Empirical inquiry in this domain has predominantly examined how different feedback types affect textual aspects of student writing, often through comparative studies (Bitchener & Storch, 2016). However, much of this research has emphasized writing outcomes rather than the development of self-regulatory behaviors (Carless & Boud, 2018; Cheng & Liu, 2022). Studies on AWEF, for instance, have largely contrasted it with teacher feedback in terms of writing performance, while overlooking its potential to shape self-regulation (Link et al., 2022). Similarly, investigations comparing AWEF and PF have tended to focus on holistic writing improvement (Lazic & Tsuji, 2020) or on specific textual features such as cohesion and coherence (Chen & Cui, 2022). Moreover, research on self-regulation has primarily concentrated on teacher feedback, with scant attention to peer feedback (Yang et al., 2022).

In response to these gaps, the present study aimed to compare the effects of AWEF and PF on writing self-regulation among Iranian EFL learners. To ensure a comprehensive understanding, a mixed-methods explanatory sequential design was employed, integrating both quantitative and qualitative data.

2. Review of the Related Literature

2.1. Self-Regulation in Language Learning

Zimmerman's (2000) social cognitive theory conceptualizes SRL as a cyclical process comprising three interrelated phases: forethought, performance, and self-reflection. Each phase engages learners in distinct self-regulatory strategies to achieve academic objectives. During forethought, learners assess the task, set goals, and devise strategies for goal attainment processes underpinned by motivational beliefs that facilitate strategy adoption. The performance phase involves active task engagement coupled with progress monitoring. Here, self-control strategies (e.g., task management, self-instruction, help-seeking) intersect with self-observation strategies that systematically track performance. CF serves as an external scaffold in this phase, assisting learners in evaluating and refining their work in real time. The final phase, self-reflection, encompasses self-judgment, where learners appraise task quality and analyze reasons for success or failure. Insights from this evaluation inform future strategy adjustments, completing the cyclical nature of SRL. Zimmerman (2000) argued that SRL is foundational in language learning, as self-regulated learners demonstrate heightened metacognitive awareness, sustained motivation, and active engagement.

2.2. Empirical Studies on Feedback and Self-Regulation

While numerous studies have examined the effects of AWEF and PF on writing performance, findings have been varied. Lazic and Tsuji (2020) reported that combining AWEF with PF facilitated more effective revisions, particularly among lower-proficiency students. Similarly, Xie et al. (2020) found that both feedback types improved writing, though AWEF primarily bolstered accuracy and complexity, while PF enhanced accuracy. In contrast, Ginting and Fithriani (2022) highlighted students' preference for PF over AWEF (e.g., Grammarly), emphasizing the perceived relevance of peer-generated input. Chen and Cui (2022) further argued that PF was more effective than AWEF in enhancing cohesion and coherence. Özkanal and Gezen (2023) concluded that although AWEF, PF, and teacher feedback all positively influenced writing, AWEF and teacher feedback were perceived as more beneficial.

Beyond performance metrics, a smaller but growing body of literature has

examined CF's role in promoting self-regulation. Ekholm et al. (2015) demonstrated that learners' perceptions of feedback—together with self-efficacy and motivation—significantly fostered self-regulation during writing. Similarly, Taheri and Mashhadi Heidar (2019) found that focused written CF improved paragraph-writing accuracy, especially among highly self-regulated learners. Vasu et al. (2020) reported that both self-assessment and indirect teacher feedback enhanced SRL, with self-assessment proving more effective. Xu (2021) corroborated these findings, revealing that learners' feedback-seeking orientation predicted SRL strategy use in online writing courses. Nipaspong (2022) likewise illustrated the benefits of online written CF in enhancing SRL among mid- and low-proficiency students.

Further evidence comes from Vasu et al. (2022), who found that both self-assessment and indirect teacher feedback improved SRL behaviors, including goal-setting and strategy planning. Rahimi and Fathi (2022), employing a mixed-methods design, showed that wiki-mediated collaborative writing enhanced both SRL and writing performance. Sherafati and Mahmoudi Largani (2023) confirmed the superiority of computer-based feedback over traditional methods in advancing writing skills and SRL. Most recently, Prompan and Piamsai (2024) demonstrated that integrating PF with SRL instruction significantly improved both writing and SRL in Thai EFL learners, particularly in online settings.

Collectively, these studies affirm that diverse feedback forms—including self-assessment, teacher feedback, PF, and computer-based feedback—positively influence both writing performance and SRL. Nevertheless, despite extensive research on the dual role of teacher feedback (Yang et al., 2022), a notable paucity of studies remains examining how AWEF and PF specifically shape SRL strategies. Although comparative studies of AWEF and PF exist (Xie et al., 2020), to the best of the researchers' knowledge, no research has systematically explored their influence on SRL using triangulation methods.

Accordingly, this study addresses this gap by investigating and comparing the effects of AWEF and PF on the self-regulation of Iranian EFL learners during academic writing. Employing a mixed-methods explanatory sequential design—including

questionnaires, interviews, and observations—the study seeks to answer the following research questions:

RQ1. Are there significant differences in the effects of AWEF and PF on Iranian students' writing self-regulation during the academic writing process?

RQ2. How do Iranian students experience self-regulation during the writing process when receiving AWEF and PF?

3. Method

3.1. Participants

The participants in this study consisted of 58 English language learners, including both male and female individuals, aged between 25 and 30 years, all native Persian speakers. These individuals were enrolled in two intact classes at a private language institute in Tehran, where they were confirmed to possess intermediate proficiency in English, specifically at the B1 level according to the Common European Framework of Reference (CEFR). This proficiency level was assured by the institute to maintain consistency across the groups.

Convenience sampling technique was employed to select the participants from the intact classes, based on their availability and willingness to participate. The participants were assigned into two experimental groups: one group, consisting of 30 students, received PF, while the other group, with 28 students, received feedback through an AWEF, specifically ProWritingAid.

For the qualitative aspect of the study, 10 participants from each group (20 in total) were randomly selected to participate in semi-structured interviews. These interviews aimed to gather in-depth insights into how feedback influenced the participants' self-regulation strategies during the writing process. Before participating, all individuals signed informed consent forms after being fully informed about the study’s objectives, procedures, confidentiality, and their right to withdraw at any time without consequences.

3.2. Instruments

3.2.1. Writing Strategies for SRL Questionnaire (WSSRLQ)

The Writing Strategies for Self-Regulated Learning Questionnaire (WSSRLQ), adapted from Teng and Zhang (2016), was used as the primary instrument to assess participants' SRL strategies during the writing process (Appendix A). This self-assessment tool measures various cognitive, metacognitive, behavioral, and motivational strategies that learners employ to regulate their writing tasks. The WSSRLQ focuses on how learners plan, monitor, and reflect on their writing. It includes a series of items rated on a seven-point Likert scale, where participants assess the extent to which each statement applies to them, with responses ranging from "*not at all true of me*" (1) to "*very true of me*" (7).

To ensure clarity, the questionnaire was translated into Persian. After piloting the translated version with a small sample, its reliability was calculated using Cronbach's alpha, yielding a value of 0.84, indicating high internal consistency. Additionally, two experts in second language acquisition and educational assessment reviewed the final version to confirm that the questionnaire accurately measured self-regulated learning constructs within the context of EFL writing.

3.2.2. Semi-structured Interviews

In addition to the WSSRLQ, semi-structured interviews were conducted to collect qualitative data. The semi-structured format allowed for flexibility, enabling the interviewer to explore emerging topics while maintaining consistency with the predetermined questions (Adams, 2015). First, five interview questions were designed to probe aspects of self-regulation, specifically focusing on how the feedback (PF or AWEF) impacted participants' writing process and their self-regulation strategies. To ensure the content validity of the interview questions, the Content Validity Ratio (CVR) was calculated based on expert evaluations, confirming that the items adequately represented key aspects of self-regulation and feedback impact.

After that, the interview questions were piloted with a small group of participants to ensure clarity and appropriateness. Based on feedback, adjustments were made to

improve the wording and understanding of the questions. To ensure reliability, the interviewer received extensive training in conducting consistent interviews and avoiding leading questions. The questions were also reviewed by two experts in language learning and self-regulation to ensure cultural and linguistic relevance. After this rigorous process, three final main questions with possible follow-ups remained (Appendix B).

The interviews were conducted individually in a quiet environment, and lasted approximately 20 minutes each, and were audio-recorded with participants' consent to ensure accurate transcription and analysis. It is worth noting that prior to participation, all students signed informed consent forms that explained the study's aims, confidentiality measures, and their right to withdraw at any time, thereby adhering to ethical research standards. Ethical considerations also included maintaining participants' anonymity and allowing responses in Persian to facilitate authentic expression.

3.2.3. Observation

Classroom observations were conducted to supplement the questionnaire and interview data. One of the researchers observed two writing sessions in each group to gain deeper insight into the participants' self-regulation strategies during the writing process. In the AWEF group, she focused on how students interacted with the ProWritingAid tool, looking for evidence of self-regulation behaviors such as goal-setting, progress monitoring, and revisions based on automated feedback. In the PF group, the she observed how students engaged in peer feedback exchanges, concentrating on the communication of feedback and how participants applied this feedback to improve their writing. Additionally, she paid attention to how students regulated their writing process by incorporating feedback and making decisions on revisions (See Appendix C for the observation checklist).

3.3. Procedure

The study was conducted as part of a seven-week structured English writing course, with two sessions held each week, designed to prepare students for the IELTS exam. Each session lasted 1 hour and 45 minutes, with a blend of qualitative and

quantitative methods to assess SRL strategy use. The study employed a three-phase SRL-based feedback model, adapted from Yang and Zhang (2023), comprising the forethought, performance, and self-reflection phases.

The writing procedure followed a structured multi-drafting approach in which students composed initial drafts, received feedback, revised their work, and reflected on their progress. Writing topics were carefully selected from authentic IELTS Writing Task 2 prompts to ensure relevance and alignment with exam preparation objectives. These topics were chosen based on their diversity in theme and complexity, offering a comprehensive range of issues that encouraged critical thinking and argument development. To support students' development of self-regulatory strategies, explicit instruction was integrated into the course curriculum. The instructor provided targeted lessons on goal-setting, planning, self-monitoring, and self-reflection, using modeling, guided practice, and scaffolded activities. This instruction aimed to equip students with the metacognitive tools necessary to manage their writing processes effectively and to engage meaningfully with both peer and automated feedback.

In the forethought phase, participants set specific writing goals aligned with task requirements, guided by the instructor to focus on planning and self-monitoring strategies. This was facilitated through explicit goal-setting exercises where students were prompted to identify specific aspects of their writing to improve, such as coherence or grammar. The instructor used guided questioning and reflective prompts to help students articulate clear, measurable goals. Planning strategies were taught through structured outlines and writing schedules, while self-monitoring was encouraged by having students regularly check their drafts against these goals using checklists and error logs. In the performance phase, participants received feedback either from peers (PF group) or the ProWritingAid tool (AWEF group), enabling them to assess their writing against their goals and adjust their cognitive and metacognitive strategies accordingly. Finally, in the self-reflection phase, students critically reflected on their performance, identifying strengths and areas for improvement. The error log, which documented errors, revisions, and reflections, played a crucial role in tracking progress.

Participants were divided into two groups: the PF group, which initially focused on

lexical resources and later on grammatical accuracy, and the AWEF group, which received automated feedback on lexical resources in the first round and grammatical accuracy in the second. Both groups engaged in a multi-drafting process involving submitting drafts, receiving feedback, revising, and reflecting on revisions using the error log. This process was designed to capture the development of SRL strategies over the course of the study.

The data collection timeline began with the administration of the WSSRLQ in the first session to assess baseline self-regulation. From sessions 2 to 13, students worked on various IELTS Writing Task 2 topics, progressing through the SRL feedback cycle of goal-setting, feedback receipt, revision, and reflection. For the PF group, students exchanged drafts with peers and received written or verbal feedback focusing initially on lexical resources, followed by grammatical accuracy in later sessions. They then revised their drafts based on peer suggestions and reflected on their improvements using the error log. For the AWEF group, students submitted their drafts to the ProWritingAid tool, which provided immediate, detailed automated feedback first on lexical choices and later on grammar. Students reviewed this feedback individually, made revisions accordingly, and documented their changes and reflections in the error log. This iterative cycle of drafting, receiving feedback, revising, and reflecting was repeated across multiple sessions to reinforce the development of self-regulatory strategies tailored to each feedback type. In session 14, the WSSRLQ was re-administered to assess any changes in self-regulation responses of the participants. Additionally, qualitative interviews were conducted with a subset of participants to explore their experiences with the SRL feedback cycle and the effectiveness of the feedback methods. Each interview lasted approximately 20 minutes and was recorded for analysis.

Throughout the course, participant observations were conducted to examine interactions with feedback, engagement in self-regulation, and adjustments to writing strategies. These observations, documented in field notes, were analyzed in conjunction with interview data to provide a comprehensive understanding of SRL strategy application during the writing process.

4. Results

4.1. First Research Question

Before conducting independent samples t-tests, the assumption of normality was assessed using the Shapiro-Wilk test. The results indicated that self-regulation scores were approximately normally distributed for both groups at both time points. For the AWEF group, the pre-test ($W = 0.960$, $p = .350$) and post-test scores ($W = 0.953$, $p = .242$) did not significantly deviate from normality. Similarly, for the PF group, the pre-test ($W = 0.934$, $p = .061$) and post-test scores ($W = 0.950$, $p = .200$) also showed no significant violations of normality. These results supported the use of parametric tests for subsequent analyses. Also, for both the AWEF and PF groups, pre-test and post-test scores demonstrated acceptable skewness values within the range of -1 to +1, indicating that the data were approximately normally distributed. This justified the use of parametric tests for group comparisons. Therefore, to examine the impact of AWEF and PF on students' writing self-regulation, two independent samples t-tests were conducted to compare the self-regulation scores of the two groups before and after the intervention. The descriptive statistics for both the pre-test and post-test scores are presented in Table 1.

Table 1.

Descriptive Statistics for Self-Regulation Scores (Pre-test and Post-test)

Group	N	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD
AWEF	28	111.29	11.89	206.78	12.44
PF	30	109.38	5.73	173.72	9.23

As shown in Table 1, both groups had similar self-regulation scores at the pre-test stage, with the AWEF group ($M = 111.29$, $SD = 11.89$) having a slightly higher mean than the PF group ($M = 109.38$, $SD = 5.73$). However, after the intervention, the AWEF group demonstrated a significantly higher post-test mean score ($M = 206.78$, $SD = 12.44$) compared to the PF group ($M = 173.72$, $SD = 9.23$), suggesting a greater improvement in self-regulation in the AWEF group. To determine whether these differences were statistically significant, independent samples t-tests were conducted for both pre-test and post-test scores (see Table 2).

Table 2.

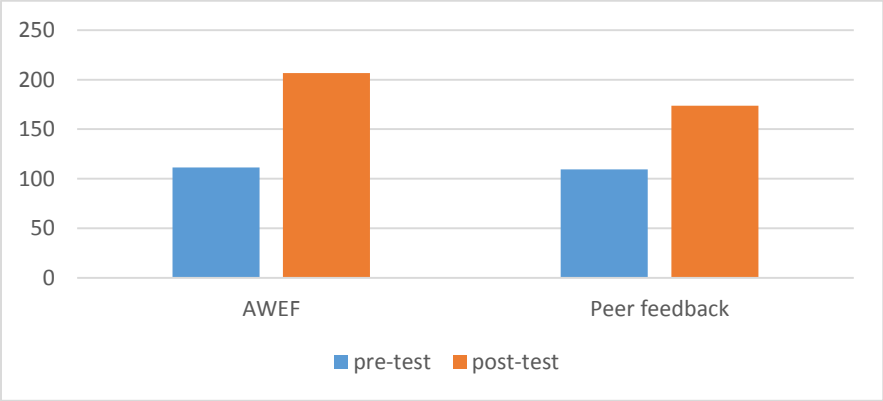
Independent Samples t-test for Self-Regulation Scores (Pre-test and Post-test)

Levene's Test of Equality of Variances									
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	
Pre-test: **variances assumed**	**Equal**	1.234	0.271	0.876	56	0.385	1.91	2.19	
Post-test: **variances assumed**	**Equal**	2.340	0.132	-11.57	56	0.000	-33.06	2.86	

Based on Table 2, Levene's Test for Equality of Variances was non-significant for both the pre-test (F = 1.234, p = 0.271) and post-test (F = 2.340, p = 0.132), indicating that the assumption of equal variances has not been violated. The pre-test comparison yielded a non-significant result (t (56) = 0.876, p = 0.385), indicating no significant difference in self-regulation between the two groups before the intervention. This suggests that the groups were homogeneous in terms of self-regulation at the outset. However, the post-test results revealed a statistically significant difference between the two groups (t (56) = 11.57, p <.001). The AWEF group significantly outperformed the PF group in writing self-regulation after the intervention, strongly suggesting that AWEF had a more substantial impact on improving students' self-regulatory behaviors throughout the academic writing process. This is illustrated in Figure 1.

Figure 1.

Mean Self-Regulation Scores for AWEF and PF Groups (Pre-test vs. Post-test)



As depicted in Figure 1, the AWEF group demonstrated a more substantial improvement in self-regulation, confirming that AWEF had a greater impact on enhancing students' ability to regulate their writing process compared to PF.

4.2. Second Research Question

The second research question sought to explore how students engaged in self-regulation during the writing process, specifically in response to the type of feedback they received—either AWEF or PF. To address this, both semi-structured interviews and classroom observations were conducted, providing rich, contextualized data on students' perceptions of feedback, their engagement with it, and the self-regulatory strategies they employed.

4.2.1. Semi-structured Interviews

The qualitative data collected through interviews offered valuable insights into how students navigated the self-regulation process when engaging with AWEF or PF. Interview transcripts were systematically coded, with both deductive and inductive coding methods employed. Some codes were derived from the theoretical framework of self-regulated learning deductively (Zimmerman, 2000), while others emerged organically from the participants' responses inductively. The coding process involved multiple rounds of review and refinement to ensure consistency and accuracy. Codes that appeared frequently across transcripts were grouped into broader themes, while less common but meaningful responses were retained as sub-codes. Throughout the analysis, the frequency of each code was recorded to assess the prominence of specific self-regulatory behaviors within each feedback group. Several sub-codes and broader themes were identified, reflecting recurring patterns in participants' self-regulatory behavior. These were categorized separately for the AWEF and PF groups to highlight potential similarities and differences in their experiences. A summary of the key sub-codes and emerging themes is presented in Table 3.

Table 3.

Themes, Codes, and Sub-codes for SRL in AWEF and PF Groups

Theme	Code	AWEF Sub-code	AWEF Frequency (n=10)	PF Sub-code	PF Frequency (n=10)
Forethought Phase	Goal Setting	Specific writing goals for structure & grammar	9	Clear goals related to task completion	6
		Long-term skill improvement	10	Immediate task-oriented goals	8
	Motivation/Task Interest	Intrinsic motivation for writing	9	Task-focused motivation, evolving interest	6
	Self-Efficacy	High confidence in writing improvement	9	Moderate confidence, growing through feedback	6
Performance Phase	Self-Monitoring	Active monitoring through AWEF feedback	10	Reflective monitoring post-feedback	9
	Time Management	Structured time allocation for each task phase	10	Growing time management, some procrastination	7
	Strategy Use	Outlining, summarizing, and drafting strategies	10	Revision strategies based on feedback	6
Self-Reflection Phase	Self-Evaluation	In-depth evaluation with feedback comparison	10	Reflection primarily for final revisions	6
	Feedback Utilization	Revisions based on AWEF feedback	10	Use of peer feedback for revisions	5
	Emotional Regulation	Active stress management	8	Growing emotional resilience	7

During the forethought phase, both groups showed evidence of goal-setting and motivation, though AWEF participants demonstrated more structured, long-term planning. AWEF participants set clear goals related to improving writing structure and coherence, as one participant explained, "*I set a clear goal to focus on structure and coherence in my writing. Every time I revised, I checked if my ideas were well organized*." In contrast, PF participants were more focused on task completion and meeting deadlines, with one stating, "*My main goal was just to finish the essay on time and make sure it was readable.*"

In terms of motivation, the AWEF group demonstrated more intrinsic motivation for writing, driven by a desire for personal growth and mastery. As one participant shared, "*I*

enjoy writing now because I know I can improve. The feedback is really helpful and encourages me to get better." On the other hand, PF participants were initially more motivated by external factors such as grades or deadlines, but began developing intrinsic motivation over time, as noted by one student, "*I think I became more interested in improving my writing once I noticed the grade and realized I could actually do better.*"

In the performance phase, AWEF participants showed more active engagement with feedback, with one participant stating, "*After every draft, I check my writing against the feedback, then I focus on the areas I need to improve.*" PF participants were more reflective in their engagement with feedback, often waiting until later stages to apply revisions. Regarding time management, AWEF students demonstrated structured planning, while PF students needed more support in managing time effectively, with some expressing difficulty in pacing their work.

In the self-reflection phase, AWEF participants were more consistent in reflecting on their drafts and incorporating feedback iteratively, as evidenced by one participant: "*I always reflect on what I did well and what I can improve. I check my progress against the goals I set.*" In contrast, PF students reflected mostly during final revisions, indicating a less iterative approach to self-evaluation.

4.2.2. Observations

Observations of the AWEF group revealed highly structured and intentional engagement with the writing process, particularly through their interaction with the ProWritingAid tool. Students actively engaged with the feedback, often evaluating each suggestion critically and applying it to improve their drafts. The researcher observation noted, "*I saw this student going through the feedback from ProWritingAid line by line, highlighting suggestions and then immediately applying them in their text.*" This demonstrated not only effective use of the tool but also a self-regulated approach to learning.

In the PF group, observations indicated a more gradual development of self-regulation. Initially, students were more focused on fixing surface-level errors, but as the course progressed, they began to engage more deeply with peer feedback. An observer remarked, "*At first, feedback exchanges were about fixing minor issues, but later I noticed*

students discussing each other's ideas more deeply."

4.2.3. Data Triangulation

The triangulation of quantitative and qualitative data provided a comprehensive view of the impact of AWEF and PF on students' self-regulation in writing. Quantitative results showed that the AWEF group significantly outperformed the PF group in terms of self-regulation scores post-intervention. Qualitative findings reinforced these results, showing that AWEF participants demonstrated more systematic and proactive feedback engagement, as well as more robust self-regulation practices throughout the writing process. However, the PF group also showed improvement, particularly in their emotional resilience and reflective approach to feedback. This triangulation suggests that while both types of feedback contributed to students' development, AWEF had a more profound impact on self-regulation in writing.

5. Discussion and Conclusion

The primary aim of this study was to investigate whether there were significant differences in how the two feedback types—AWEF and PF—affected learners' self-regulation, both in terms of quantitative scores and qualitative experiences. The results indicated that students in the AWEF group demonstrated a statistically significant increase in self-regulation scores compared to the PF group. While both groups showed improvement in their use of self-regulation strategies, such as goal-setting, planning, self-monitoring, and self-reflection, the AWEF group exhibited more substantial enhancements. The qualitative data further revealed that the AWEF group was more actively engaged in the feedback loop, using the feedback to continuously revise their work. However, the PF group tended to focus more on the interpersonal aspect of receiving feedback, which sometimes resulted in less frequent revisions and adjustments in their writing process.

The differing outcomes between AWEF and PF may be attributed to several factors, particularly the nature of the feedback and the cognitive processes involved in each feedback type. A key feature of AWEF systems, such as the one used in this study,

is their ability to provide real-time, structured feedback on various writing aspects, including grammar, vocabulary, sentence structure, and organization (Alias et al., 2024). This feedback allows learners to quickly identify and correct mistakes, facilitating iterative cycles of writing, reflection, and revision. Continuous interaction with the AWEF system likely promoted higher levels of metacognitive awareness and self-monitoring, both of which are essential components of self-regulation (Zimmerman, 2000). Furthermore, the superior performance of the AWEF group could be attributed to the fact that the feedback they received was tailored to specific aspects of their writing, providing clear, actionable advice that learners could apply immediately (Fu et al., 2024). This structure likely led to greater engagement with the feedback, as learners were able to track their progress, refine their strategies, and engage in meaningful self-assessment. On the other hand, the peer feedback process, while offering social interaction and perspective-taking, may not have provided the same level of specificity and immediacy, which could have hindered the development of more consistent self-regulation strategies.

The impact of AWEF can also be understood within the broader framework of self-regulation, particularly Zimmerman's (2000) theory, which emphasizes the importance of self-observation and feedback in fostering self-regulation. AWEF tools provide an external form of self-observation, allowing learners to monitor their progress and adjust their strategies in real time. On the contrary, PF may require more cognitive effort to interpret and apply, which could potentially detract from the focus on self-regulation. Therefore, the findings suggest that AWEF's consistency and personalized support make it a more powerful tool for promoting self-regulation in language learning, although PF still plays a valuable role in collaborative learning and social interaction.

These findings align with previous research, particularly studies that have highlighted the benefits of AWEF in supporting self-regulation in writing. For instance, Xie et al. (2020) found that AWEF enhanced both the accuracy and complexity of writing, which indirectly facilitated greater self-regulation by prompting learners to reflect on their mistakes and revise accordingly. Similarly, the study by Özkanal and Gezen (2023) corroborates the idea that AWEF, when used effectively, leads to positive writing outcomes, suggesting that the structured nature of automated feedback helps learners engage in sustained self-regulation through repeated cycles of feedback and revision.

These studies suggest that automated systems provide consistent and specific feedback, empowering learners to manage their writing process more effectively and promoting greater self-regulation and metacognitive awareness (Zimmerman, 2000). The present study's results also align with those of Lazic and Tsuji (2020), who noted that combining AWEF and peer feedback led to greater improvements in writing for students with lower proficiency levels. This suggests that the automation and precision of AWEF offer an essential foundation for learners, not only improving writing skills but also fostering the development of self-regulatory behaviors, as evidenced by the significant improvements in the AWEF group in this study.

However, the present findings contrast with some other studies that emphasize the perceived advantages of peer feedback. For instance, Ginting and Fithriani (2022) found that students generally favored PF over AWEF, particularly due to its perceived relevance, interactivity, and the social element associated with peer interactions. These researchers argued that peer feedback fosters more personal engagement with the writing process, which can enhance motivation and result in a more meaningful revision process. On the other hand, the current study found that AWEF, rather than PF, contributed to greater self-regulation. This discrepancy may be due to the differing nature of the feedback processes. While PF provides valuable social and collaborative elements, it may lack the immediate and specific guidance that AWEF offers, especially for students who struggle with more advanced writing tasks. Similarly, Chen and Cui (2022) suggested that PF is particularly effective in improving cohesion and coherence in writing, and this emphasis on content-level feedback could explain why some students may prefer PF over automated systems. However, the findings of this study contradict this view, as the AWEF group demonstrated superior improvements in self-regulation, likely due to the more direct and task-focused nature of automated feedback. The immediacy of AWEF likely encouraged students to engage in repeated cycles of reflection and revision, which are crucial for developing self-regulation skills.

The findings of this study have significant implications for educational practice, particularly in emphasizing the integration of AWEF tools into curricula. Additionally, the results support the potential benefits of a mixed approach that combines AWEF with PF to enhance learning outcomes. The study also underscores the growing importance of

educational technology in fostering self-regulation and metacognitive awareness among learners. However, several limitations must be considered, including the relatively small and homogenous sample size and the reliance on self-reported data. These factors may limit the generalizability and reliability of the findings. Future research should explore the combined effects of AWEF and PF, examining their impact across different proficiency levels and cultural contexts. Furthermore, additional studies could investigate other forms of technology-enhanced feedback and conduct cross-cultural comparisons to assess how these feedback mechanisms perform in diverse educational settings.

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Appendix A

WSSRLQ Questionnaire

Not at all true of me	Not true of me	Slightly not true of me	Neutral	Slightly true of me	True of me	Very true of me
1	2	3	4	5	6	7

Text Processing

1. When writing, I use some literary devices to make the composition more interesting.

1	2	3	4	5	6	7

2. When revising, I check for grammar mistakes.

1	2	3	4	5	6	7

3. When revising, I check spelling and punctuation.

1	2	3	4	5	6	7

4. When revising, I check the structure for logical coherence.

1	2	3	4	5	6	7

5. When revising, I check the cohesiveness or connection among sentences.

1	2	3	4	5	6	7

6. When revising, I check whether the topic and the content have been clearly expressed.

1	2	3	4	5	6	7

Knowledge Rehearsal

7. I write useful words and expressions taught in writing courses to help me remember.

1	2	3	4	5	6	7

8. I speak out useful words and expressions taught in writing courses to help me remember.

1	2	3	4	5	6	7

9. I read my class notes and the course material over and over again to help me remember.

1	2	3	4	5	6	7

Idea Planning

10. I read related articles to help me plan.

1	2	3	4	5	6	7

11. I use the internet to search for related information to help me plan.

1	2	3	4	5	6	7

12. I think about the core elements of a good composition learned to help me plan.

1	2	3	4	5	6	7

Goal-Oriented Monitoring and Evaluating

13. When I learn English writing, I set up goals for myself in order to direct my activities.

1	2	3	4	5	6	7

14. I check my English learning progress to make sure I achieve my goal.

1	2	3	4	5	6	7

15. I evaluate my mastery of the content in writing courses.

1	2	3	4	5	6	7

16. I monitor my learning process in writing courses.

1	2	3	4	5	6	7

17. When I am writing, I tell myself to stick to my plan.

1	2	3	4	5	6	7

18. I set up a learning goal to improve my writing.

1	2	3	4	5	6	7

Peer Learning

19. I brainstorm with peers to help me to write.

1	2	3	4	5	6	7

20. I discuss with my peers to have more ideas to write.

1	2	3	4	5	6	7

21. I work with other students in writing courses.

1	2	3	4	5	6	7

Feedback Handling

22. I am open to peers' feedback on my writing.

1	2	3	4	5	6	7

23. I am open to teachers' feedback on my writing.

1	2	3	4	5	6	7

24. I try to improve my English writing based on peers' feedback.

1	2	3	4	5	6	7

25. I try to improve my English writing based on teachers' feedback.

1	2	3	4	5	6	7

Interest Enhancement

26. I look for ways to bring more fun to the learning of writing.

1	2	3	4	5	6	7

27. I choose interesting topics to practice writing.

1	2	3	4	5	6	7

28. I connect the writing task with my real life to intrigue me.

1	2	3	4	5	6	7

29. I try to connect the writing task with my personal interest.

1	2	3	4	5	6	7

Motivational Self-Talk

30. I remind myself about how important it is to get good grades in writing courses.

1	2	3	4	5	6	7

31. I tell myself that I need to keep studying to improve my writing competence.

1	2	3	4	5	6	7

32. I tell myself that it is important to practice writing.

1	2	3	4	5	6	7

33. I pay much attention to writing courses to learn more.

1	2	3	4	5	6	7

34. I tell myself to practice writing to get good grades.

1	2	3	4	5	6	7

35. I persuade myself to work hard in writing courses to improve my writing skills.

1	2	3	4	5	6	7

36. I persuade myself to keep on learning in writing courses to find out how much I can learn.

1	2	3	4	5	6	7

37. I tell myself that I should keep on learning to write.

1	2	3	4	5	6	7

Emotional Control

38. I tell myself not to worry when taking a writing test.

1	2	3	4	5	6	7

39. I tell myself to keep on writing when I want to give it up.

1	2	3	4	5	6	7

40. I find ways to regulate my mood when I want to give up writing courses.

1	2	3	4	5	6	7

Appendix B

Interview Questions

1. How do you set goals and plan your writing when using [AWEF / peer feedback]? and can you describe any specific strategies you use during this phase?
2. Can you explain how you monitor your progress and manage your time while writing, especially when you receive feedback from [AWEF / your peers]?
3. How do you reflect on your writing after receiving feedback? And what role does this reflection play in your revisions and motivation to improve?

Appendix C

Observation Checklist

SRL Phase	Observation Focus	AWEF Group (✓/X)	PF Group (✓/X)	Comments
Forethought	Student sets specific writing goals (e.g., structure, grammar)			
	Student plans task based on feedback requirements			
Performance	Student actively engages with feedback tool (AWEF) / peer feedback (PF)			
	Student critically evaluates and applies feedback			
	Student manages time effectively during writing phases			
Self-Reflection	Student reflects on progress and feedback during revisions			
	Student uses feedback to make iterative improvements			
Affective Behavior	Student shows persistence, motivation, or manages stress			

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Leveraging artificial intelligence for vocabulary development: Effects on recall and retention in English for specific purposes contexts

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Abstract

English for Specific Purposes (ESP) education has gained prominence as a specialized field designed to address the distinct linguistic needs of learners. Although AI-enhanced instruction has been investigated within general English language learning, its implementation in ESP contexts particularly concerning vocabulary recall and retention has remained insufficiently explored. This study sought to evaluate the impact of AI-supported instruction on vocabulary recall and retention among Iranian ESP learners. Based on non-random convenience sampling, a total of 48 undergraduate students in an ESP course from a university in a southeastern province in Iran participated in the present quasi-experimental study. The participants were non-randomly assigned into two different groups: an experimental group (n=24) receiving AI-powered vocabulary instruction through Diffit, and a control group (n=24) receiving traditional print-based vocabulary instruction. Data were collected during a twelve-week intervention through AI-powered instruction of ESP vocabulary. To address the research questions, a univariate repeated measures analysis of covariate (ANCOVA) was employed. Findings revealed that AI-enhanced instruction significantly improved vocabulary recall and retention among ESP learners. The results offer robust evidence supporting the efficacy of AI-based instructional approaches in enhancing vocabulary learning outcomes within ESP settings.

Key Words: Artificial Intelligence, English for Specific Purposes, Vocabulary Recall, Vocabulary Retention

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1. Introduction

The integration of Artificial Intelligence (AI) into educational settings has significantly reshaped traditional pedagogical approaches by enabling more personalized, adaptive, and interactive learning experiences. AI-driven tools, such as Intelligent Tutoring Systems (ITSs) and language learning applications, adapt instructional content to individual learner needs, offering real-time feedback and dynamic adjustments to optimize comprehension and self-regulated learning (Li et al., 2024; Sussmann, 2024). These advancements contribute to the accessibility of flexible, learner-centered environments that promote autonomy and sustained engagement (Hwang et al., 2020; Medina, 2024). Given these developments, a plethora of research has been directed towards the role of AI in language education, investigating its potential to enhance instructional efficacy and learner outcomes (Huang, 2022; Kohnke et al., 2023; Kundu & Parida, 2022; Li et al., 2024; Relmasira et al., 2023)

Noteworthy to mention, the effectiveness of AI in education is contingent upon learners' familiarity with digital tools. Research suggests that students with higher AI literacy demonstrate greater confidence and willingness to integrate AI into their learning processes, whereas those with limited exposure to digital technologies may find the experience overwhelming or ineffective (Hao & Liu, 2022; Kundu & Parida, 2022; Rezaei Ali Kamar et al., 2021). Such disparities underscore the importance of providing adequate training and support to ensure equitable access to AI-enhanced language learning. Furthermore, AI technologies have shown to reduce cognitive load by minimizing extraneous processing demands, allowing learners to focus on higher-order tasks (Mayer, 2021; Sweller, 2019). By delivering instant feedback and automated error correction, AI tools alleviate the cognitive burden associated with self-monitoring, enabling learners to dedicate more cognitive resources to content mastery within a supportive and low-anxiety learning environment (Tuan, 2022).

Unquestionably, English for Specific Purposes (ESP) education has gained prominence as a specialized approach designed to address the distinct linguistic needs of learners, equipping them with the language competencies required in professional and academic contexts (Macia, 2012). Characterized by its goal-oriented, highly relevant, and

practical nature, ESP instruction emphasizes language skill development in alignment with learners' career trajectories (Liu, 2017). A defining feature of ESP is its learner-centered approach that necessitates a thorough understanding of domain-specific language use in students' target occupational settings (Alaqlobi et al., 2024; Chen et al., 2020). Given this focus, ESP practitioners must continuously adapt instructional strategies to ensure alignment with evolving demands in ESP settings.

A critical component of ESP proficiency is vocabulary acquisition, as it underpins learners' ability to function effectively in discipline-specific contexts. Mastery of specialized terminology is essential for the development of language skills (listening, speaking, reading, and writing), as it facilitates comprehension and fluency in both oral and written communication (Pokupec & Njerš, 2014). Vocabulary plays a pivotal role in ESP contexts as it equips learners with the lexical precision required for effective communication in specialized academic or professional domains. Coxhead (2022) also highlighted that targeted vocabulary instruction enhances learners' ability to decode complex texts.

In this regard, Schmidt (2010) argued that vocabulary is central to second language acquisition, necessitating frequent encounters and a combination of explicit instruction and incidental learning. This idea emphasizes that the word knowledge develops over time and in layers of form, meaning, and use. In short, vocabulary is not just a building block, but also the very core of achieving communicative competence in a new language. Similarly, vocabulary is at the heart of ESP, as it enables the users to communicate effectively in specialized fields like medicine, business, industry, or science (Al Zahrani & Chaudhary, 2022). In sum, vocabulary learning in ESP is targeted, practical, and tailored to the learners' actual needs, making it a key driver of communicative competence in specific professional settings (Woodrow, 2017).

Within ESP, vocabulary recall and retention are particularly crucial, as they determine learners' capacity to accurately retrieve and apply domain-specific terminology (Nation, 2013; Schmidt, 2010). Vocabulary recall refers to the ability to actively retrieve learned words when needed, whereas vocabulary retention involves the long-term storage and sustained accessibility of lexical knowledge (Nation, 2013). These processes

are interdependent. While recall ensures immediate communicative competence, retention guarantees the durability of vocabulary knowledge, both of which are indispensable for academic and professional success.

In Iran, where English is taught as a foreign language, ESP courses are increasingly vital due to globalization and the demand for professional communication in fields such as medicine, engineering, tourism, industry, and business etc. (Hayati & Jalilifar, 2009). However, conventional vocabulary instruction often relying on rote memorization and decontextualized word lists fails to meet the specialized needs of ESP learners, resulting in persistent proficiency gaps (Gholami & Khosravi, 2022). This shortcoming is particularly acute in tourism English, a subfield of ESP requiring intercultural communicative competence. Despite its practical orientation, tourism English instruction in Iran lacks authentic contextualization and off-campus practice, leaving learners ill-prepared for real-world interactions (Mostafaei Alaei & Ershadi., 2016).

While AI-enhanced vocabulary instruction has been explored in general English contexts (Huang et al., 2021; Kohnke et al., 2023), its application to ESP particularly for retention-focused outcomes has remained underexplored in Iran. This gap is critical, as retention is a prerequisite for the practical application of ESP vocabulary in professional settings (Stockwell, 2013). The current study attempted to address this gap by investigating the impact of AI-enhanced instruction on vocabulary recall and retention among Iranian ESP learners in tourism, with the following research questions:

1. Does AI-enhanced instruction have any significant effect on Iranian ESP learners' vocabulary recall?
2. Does AI-enhanced instruction have any significant effect on Iranian ESP learners' vocabulary retention?

In line with the research questions, the following hypotheses were formulated:

H_{01}. AI-enhanced instruction has no significant effect on Iranian ESP learners' vocabulary recall.

H_{02}. AI-enhanced instruction has no significant effect on Iranian ESP learners' vocabulary retention.

2. Review of the Related Literature

Empirical studies consistently report positive outcomes for AI-assisted vocabulary learning (Kohnke & Moorhouse, 2021; Pham et al., 2024; Silitonga et al., 2024; Sun & Wang, 2020; Valencia et al., 2020; Zhang & Zou, 2020). AI-driven platforms employ adaptive learning algorithms, spaced repetition, and natural language processing (NLP) to tailor vocabulary instruction to individual learners, thereby maximizing engagement and learning effectiveness (Selvi & Thirumoorthi, 2024). These technologies address common challenges in vocabulary acquisition such as lack of contextualization, difficulties in pronunciation, and limited motivation by providing immediate feedback, contextual examples, and gamified elements that sustain learner interest (Cui, 2024).

As in other areas of education, AI is reshaping ESP vocabulary instruction by offering individualized, real-time, and contextually relevant practice opportunities. In ESP contexts, AI applications can be implemented to generate examples, practice tasks, interactive games or quizzes, and even real-world communication scenarios relevant to learners' careers. AI also enables learners to review and expand specialized vocabulary outside the classroom, supports self-study, and helps teachers quickly prepare targeted materials (Coxhead, 2022).

Research has revealed that mastering technical, semi-technical, and general vocabulary is essential for ESP students to comprehend and produce discipline-specific texts (Coxhead, 2022; Pokupec & Njerš, 2014; Woodrow, 2017). Additionally, needs analyses reveal that vocabulary gaps directly hinder occupational competence, underscoring the necessity of context-driven lexical instruction (Dudley-Evans & St John, 1998). ESP pedagogy thus prioritizes sociocultural competence; ensuring learners not only acquire terms but also use them appropriately within professional discourse communities. Ultimately, vocabulary mastery in ESP bridges linguistic and disciplinary knowledge, fostering both academic success and career readiness (Makhmudova & Mashrapova, 2024).

The consensus among scholars (Dudley-Evans & St John, 1998; Makhmudova & Mashrapova, 2024) is that ESP learners require not just technical terminology but also sociocultural competence to use language appropriately in professional settings. This

aligns with broader ESP pedagogy, which emphasizes context-driven instruction. However, the literature does not sufficiently address how AI can facilitate sociocultural learning, as most studies focus on retention and recall rather than pragmatic or discourse-based competence.

The present study is anchored in Cognitive Load Theory (CLT), which posits that learning efficiency is maximized when instructional design aligns with the brain's cognitive architecture, minimizing extraneous load while fostering relevant cognitive processing (Sweller, 1988). AI-driven tools, particularly adaptive learning systems, operationalize CLT principles by tailoring vocabulary instruction to individual proficiency levels, thereby optimizing cognitive load management (Sweller, 2019; Sweller et al., 2019). The application of CLT provides a robust framework for understanding the benefits of AI in vocabulary learning. Adaptive capabilities of AI align well with CLT by minimizing extraneous cognitive load and optimizing schema acquisition. However, empirical validation remains limited—most cited studies (e.g., Kohnke & Moorhouse, 2021; Zhang & Zou, 2020) focus on short-term outcomes rather than long-term cognitive efficiency.

Research on the efficacy of AI-enhanced instruction in improving vocabulary recall and retention has yielded mixed yet promising results. Several studies highlight AI's dual benefits, noting that retention effects tend to be more pronounced (Huang & Zou, 2021; Lin & Huang, 2021; Lin & Vuono, 2019; Lu & Li, 2020; Zou & Xie, 2019). Conversely, other investigations suggest that AI-driven adaptive learning systems enhance both immediate recall and long-term retention by personalizing learning trajectories (Chen & Zhang, 2019; Kohnke & Moorhouse, 2021; Sun & Wang, 2020; Wang & Vásquez, 2021; Zhang & Zou, 2020). For instance, AI platforms facilitate self-paced vocabulary engagement that strengthens recall (Chen & Zhang, 2019), while adaptive tools reinforce retention through immediate corrective feedback and systematic practice (Kohnke & Moorhouse, 2021).

Direct engagement through AI-driven instruction has also contributed to positive ESP vocabulary learning. Studies indicate that learners using AI chatbots outperform peers in traditional settings, both in recall and retention, as these tools enable repeated exposure to vocabulary in meaningful contexts, adapt difficulty levels to learner needs,

and provide instant feedback (Lyu et al., 2024). This active involvement boosts learner motivation and self-directed learning, making vocabulary practice both accessible and engaging—particularly valuable for adult learners and those with professional commitments (Pham et al., 2024).

Empirical evidence further supports these claims. For instance, Silitonga et al. (2024) observed significant improvements in ESP vocabulary acquisition among students using an AI chatbot (Dialogflow), while Valencia et al. (2020) reported enhanced retention and motivation among foreign language learners utilizing multimodal strategies of Memrise. Similarly, Pham et al. (2024) reported that students' use of POE as an AI tool exhibited sustained engagement and perceived its utility favorably, with all participants expressing intent to continue its use.

Surprisingly, the results of some studies show that AI does not always lead to English vocabulary development. For example, Bastani et al. (2024) found that high school students who used AI platforms actually performed worse on vocabulary assessments compared to the participants with no AI access, possibly due to over-reliance on AI. Similarly, Machin-Mastromatteo (2023) suggested that while AI can help, results are mixed, with some learners showing minimal or no improvement in vocabulary when using AI-based approaches over traditional instruction. As another study, Trabelsi (2025) highlighted similar findings, noting over-dependence on AI tools can sometimes harm language learning outcomes, with students showing weaker retention and recall after practicing with AI compared to traditional methods.

While AI offers dynamic, customizable learning experiences (Hwang et al., 2020; Coxhead, 2022), its real-world implementation faces challenges such as over-reliance on technology. Although Silitonga et al. (2024) reported high learner engagement with AI tools, it is unclear whether this translates to autonomous language use in professional settings. Despite the potentials of AI in vocabulary development, variability in outcomes persists. The meta-analysis on AI-assisted language learning conducted by Huang et al. (2022) found that while AI tools consistently enhance retention, their effects on recall and retention depend on design factors like interactivity and personalization.

Regrettably, longitudinal data remain scarce as Alhusaiyan (2025) cautioned; most

studies (Pham et al., 2024; Silitonga et al., 2024) measure outcomes over weeks rather than months, leaving open questions about durability. Empirical validation of AI's long-term cognitive benefits is limited as most studies (Kohnke & Moorhouse, 2021; Zhang & Zou, 2020) focused on immediate gains rather than sustained lexical automation. Such studies presented an optimistic view of the role of AI in vocabulary acquisition. For instance, the studies by Huang & Zou (2021) and Lin & Vuono (2019) highlighted the advantages of AI; however, the mixed results suggest variability in implementation—some AI tools such as Memrise may excel in retention while other AI tools like POE enhance engagement.

3. Method

3.1. Design

The current study adopted a quasi-experimental pretest-posttest control group design. The artificial intelligence instruction was the independent variable and ESP vocabulary recall and retention functioned as the dependent variables. This design was selected as the study sought to investigate the effectiveness of AI-enhanced instructional intervention on vocabulary recall and retention among ESP learners.

3.2. Participants

Using non-random convenience sampling, the study adopted a quasi-experimental design with 57 undergraduate Tourism students (37.2% male, 62.8% female) enrolled in an English for Specific Purposes (ESP) course at a university in a southeastern province in Iran. Participants, aged 19-26 (M= 20.4, SD= 2.1), were native Persian speakers. For Iranian undergraduate learners of Tourism, ESP is a compulsory course administered in the second year of their program.

Prior to the treatment, the researcher administered Oxford Placement Test (OPT) to ensure the homogeneity of the participants. The results of OPT revealed that 48 participants were at the pre-intermediate level of English proficiency, 4 learners were at intermediate level, and 5 participants showed elementary level of English proficiency. As a result of excluding the intermediate and elementary students from the final analysis, the

researcher was left with a sample of 48 pre-intermediate participants who were randomly assigned to an experimental group (n=24) and a control group (n=24). It should be noted that the participants in experimental group were required to avoid exposure to AI tools outside the class, particularly those designed for English vocabulary development.

Experimental group (EG) received AI-enhanced instruction, while the control group (CG) followed traditional vocabulary instruction. Prior to the study, participants had no experience with AI-based language instruction. Ethical protocols were strictly followed, including obtaining informed consent, ensuring voluntary participation with the right to withdraw, and maintaining confidentiality throughout the research process.

3.3. Instruments and Materials

3.3.1 Oxford Placement Test

In order to choose almost homogeneous participants in terms of English language proficiency, The Oxford Placement Test (OPT) was used as a criterion-referenced test. The OPT test is a widely used assessment instrument comprising 60 components (taking almost 60 minutes) aimed at evaluating overall English proficiency. It provides quick results with Common European Framework of Reference (CEFR) as the indicator of English proficiency (A1-C2). For educators and researchers, OPT provides a reliable and efficient means of placing students at the onset of a course (Allan, 2004).

3.3.2. ESP Course Book

In both groups, the course material utilized in the current research was “Check Your English Vocabulary for Leisure, Travel, and Tourism” authored by Wyatt (2007). Consisting of sixty-two units, this book is a specialized course book designed to help learners improve their vocabulary in hospitality, tourism, and leisure contexts. It features exercises, word games, and practical activities tailored to tourism-specific terms such as hotel bookings, travel arrangement, and customer service. With a clear, structured approach, it covers key terminology, common phrases, and situational dialogs relevant to tourism sector. Altogether, eight units of this book (food terminology, accommodation types, air travel vocabulary, financial terms, transportation vocabulary, money issues, on

the road, and car hire) were covered during the intervention.

3.3.3. Diffit; An AI-powered Platform

Making language learning more inclusive and efficient, Diffit (an AI-powered platform) supports differentiated learning materials tailored to various proficiency levels by simply inputting a topic and the desired complexity. This functionality provided the opportunity to offer a more relevant and engaging learning experience, thereby enhancing students' comprehension of specialized terminology and concepts that were essential in tourism. The possibility to incorporate visuals and graphics responded to the learners' diverse learning styles thus promoting an inclusive learning environment. Adding to the authenticity of the lesson, the participants could type the given topics in the search field. Self-paced learning, language support, test preparation and remediation, and independent exploration are just some of the key features of Diffit.

3.3.4. ESP Vocabulary Test

As the next instrument of the study, tests of vocabulary were administered to evaluate both groups' ability in ESP vocabulary. This assessment focused on the vocabulary content presented in the book "Check Your English Vocabulary for Leisure, Travel, and Tourism" authored by Wyatt (2007). Three vocabulary tests with an approximate time of 20 minutes each were administered to the participants of both groups as pre-test (at the outset of the semester), post-test (in week six), and delayed post-test (in week 12). Each test consisted of 25 fill-in-the-blanks or matching items with each item having one score (See Appendix). The participants' scores at each test could range from 0-25. The tests provided in the course book assessed ESP students' progress of individual units and were designed to align with the topics covered in class and the language taught for this specific course. Pre-test, post-test, and delayed post-test followed the same format and level of difficulty. The pre-test, post-test, and delayed post-test Cronbach's alpha reliability coefficients were 0.78, 0.82, and 0.81, respectively.

In order to ensure the interrater reliability for the ESP vocabulary tests, a university professor with 14 years of experience in teaching English as a foreign language was invited as an independent rater to score the tests as well. As the type of test items required objective scoring (fill-in-the-blanks and matching items), the interrater reliabilities

calculated for the pre-test, post-test, and delayed post-test were 0.91, 0.94, and 0.92 indicating high reliabilities.

3.4. Data Collection and Analysis Procedures

To ensure the homogeneity of the participants, an Oxford Placement Test was administered at the outset of the study. After the exclusion of elementary and intermediate students, 48 participants were randomly assigned to experimental (EG) and control (CG) groups. A Twelve-week intervention was conducted during 2024-2025 academic year in ESP Tourism classes at a university in a southeastern province in Iran.

The researcher (instructor) ensured consistency by implementing identical instructional materials for both groups; however, the experimental group utilized Diffit, an AI-powered platform as the supplementary material during the final 20 minutes of instruction session of each vocabulary unit. This tool provided customized texts with adjustable complexity levels, key vocabulary lists with definitions and contextual examples, multiple-choice and short-answer questions, and multimedia visual aids. Students in EG were also engaged with AI-generated materials (Word, PDF, or Power Point formats) through selected activities so that Diffit generated a text accompanied by a list of key words with definitions and example sentences, multiple-choice questions, and short-answer items. The participants were then directed to select a series of activities from the pre-defined ones and export their generated materials in different formats.

Control group (CG), however, only used the textbook “Check Your English Vocabulary for Leisure, Travel, and Tourism” (Wyatt, 2007). CG students were asked to complete conventional vocabulary exercises on food terminology, accommodation types, air travel vocabulary, financial terms, transportation vocabulary, money issues, on the road, and car hire. Different exercises in the course book focused on the specialized vocabulary that Tourism learners need to understand and use in their profession. It should be mentioned that both groups covered tourism-related vocabulary topics (food and cooking, hotels and accommodation, transport, air travel, money, roads, car, and traffic).

Students of both EG and CG were assessed at week six for their immediate learning gains to check their vocabulary recall as well as week twelve of the semester for their long-term retention effects. Regarding vocabulary recall and retention, the

participants of both groups were assessed through a pre-test, a post-test, and a delayed post-test. In order to address the research questions, a univariate repeated measures ANCOVA was employed to investigate the differences between groups while controlling for pre-test scores. This design allowed for examining both immediate learning gains and long-term retention effects. The following section delves into the results, tabulates the data, and visually illustrates the data analysis pertinent to the study.

4. Results

The research questions were concerned with whether AI-powered instruction had any significant effect on Iranian ESP learners' vocabulary recall and retention. As observed, the mean and standard deviation of word recall and retention variables for the control and experimental groups at the pre-test, post-test, and delayed post-test stages are reported in Table 1.

Table 1.

Descriptive Statistics of Participants' Scores on Pre-test, Post-test, and Delayed Post-test

Group	**Descriptive Index**	**Stages**		
		Pre-test	Post-test	Delayed Post-test
Control	*Mean ± SD*	17.21 ± 3.41	17.54 ± 3.05	17.46 ± 2.84
	Skewness-Kurtosis	-0.15 - 0.73	-0.41 - 0.58	-0.66 - 0.15
Experimental	*Mean ± SD*	17.38 ± 3.59	20.08 ± 2.98	21.04 ± 2.84
	Skewness-Kurtosis	-0.15 - 0.75	-0.02 - 0.74	-0.37 - 0.77

According to Table 1, the mean scores of word recall and retention for both the experimental and control groups changed in the post-test and delayed post-test stages compared to the pre-test stage. These changes indicate that the post-test and delayed post-test scores of students in the experimental group increased in both short-term and long-term word retention.

The research hypotheses were addressed using a univariate repeated measures analysis of covariance (ANCOVA). The use of this analysis requires adherence to certain assumptions, which were examined before conducting the test. The most important

assumptions include: normality of data distribution, homogeneity of variances, homogeneity of regression slopes, and the absence of outliers. To assess the assumption of normality, skewness and kurtosis indices were used. The results in Table 1 show that the skewness and kurtosis indices for word retention fell within the range of -2 to +2, indicating normal distribution. Additionally, the results of the Kolmogorov-Smirnov test (P > 0.05) confirmed the normality of data distribution at the pre-test, post-test, and delayed post-test stages. To examine the assumption of homogeneity of variances, Levene's test was used. The non-significant F value (P > 0.05) indicated that the assumption of homogeneity of variances was also met (Table 2).

To assess the assumption of homogeneity of regression slopes, the significance of the interaction between the pre-test and the grouping variable at the post-test and delayed post-test stages was examined. Given the non-significant F statistic, the assumption of homogeneity of regression slopes was satisfied (F(2,45) = 0.389, P = 0.537). Since all assumptions for the univariate repeated measures ANCOVA were met, the use of this test was justified. Furthermore, Mauchly's test of sphericity was used to examine the assumption of homogeneity of variance-covariance matrices. Given the significance value of Mauchly's test (P = 0.343), the assumption of homogeneity of variance-covariance matrices was also met, and no violation of the statistical model was observed. Additionally, the Greenhouse-Geisser epsilon value indicated that the variance-covariance matrix of the model deviated only slightly from the F statistical model as illustrated in Table 2.

Table 2.

Mauchly's Test of Sphericity for Model Validity

Greenhouse-Geisser Epsilon	Significance Value	Degrees of Freedom	Mauchly's W	Levene's Test P-value	Kolmogorov-Smirnov Test P-value	Stages
0.956	0.343*	2	0.954	0.975* 0.898* 0.868*	0.19* 0.22* 0.29*	Pre-test Post-test delayed Post-test

The results of the univariate repeated measures ANCOVA for the experimental

and control groups at different stages of the study are presented in Table 3.

Table 3.

Univariate Repeated Measures ANCOVA For EG and CG at Different Stages

Source	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance	Effect Size (η^2)
Time	101.431	2	50.715	74.093	0.001*	0.617
Group	158.340	1	158.340	5.623	0.022*	0.109
Time × Group	73.597	2	36.799	53.761	0.001*	0.539

The results in Table 3 show that the effect of the group on the variable word recall among students is significant (F(1,46) = 5.623, P= 0.022, η^2 = 0.109). The results indicate that there is a significant difference between the experimental and control groups, with 11% of the variance in the population attributable to the interaction between the dependent variables. Thus, the intervention had a significant effect on improving word recall among students. Additionally, the effect of time on the variable word retention is also significant (F(2,92) = 74.093, P= 0.001, η^2 = 0.617). In other words, there is a significant difference in word retention among students at the three stages: pre-test, post-test (short-term memory), and delayed post-test (long-term memory). Furthermore, the interaction effect of time and group on the variable word retention is significant (F(2,92) = 53.761, P = 0.001, η^2 = 0.539). This indicates a significant difference in word retention among students in the experimental and control groups across the three stages. The results of the Fisher's Least Significant Difference (LSD) post-hoc test to examine the stability of AI-based vocabulary training on word retention are presented in Table 4.

Table 4.

Results of Fisher's LSD Post-hoc Test for the Stability of AI-based Vocabulary Training on Word Retention

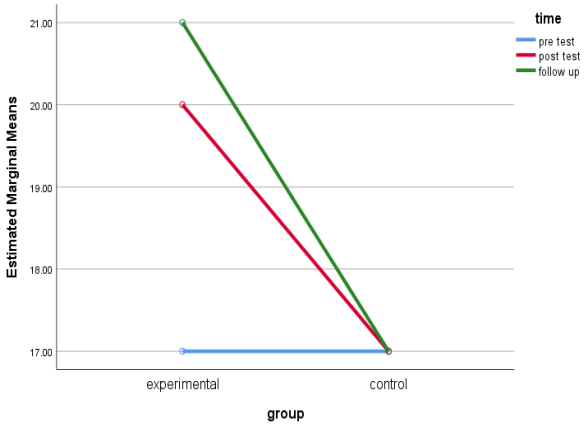
Time	Pre-test	Post-test	Delayed Post-test
Pre-test	-	1.521*	1.958*
Post-test (Short-term Memory)	1.521*	-	0.438*
Delayed			

Post-test (Long-term Memory)	1.958*	0.438*	-

The results of Fisher's LSD post-hoc test in Table 4 show a significant difference between the mean scores of word retention at the pre-test stage and the post-test (short-term memory) stage ($P < 0.05$). Similarly, there is a significant difference between the mean scores at the pre-test stage and the delayed post-test (long-term memory) stage ($P < 0.05$). Moreover, the mean scores of word retention at the delayed post-test (long-term memory) stage were significantly higher than those at the post-test (short-term memory) stage as visually illustrated in Fig 1.

Figure 1.

Comparison of Means of EG and CG Across Three Stages



Therefore, the effectiveness of AI-based vocabulary training on both short-term and long-term memory retention was confirmed and the null hypotheses were rejected.

5. Discussion

The current study demonstrated that AI-enhanced instruction significantly improved both vocabulary recall and retention among ESP learners, corroborating previous research on the efficacy of AI in language learning (Chen & Zhang, 2019; Huang, 2022; Li et al., 2024; Relmasira et al., 2023). These findings align with the established

premise that AI-powered platforms facilitate personalized learning experiences by reducing unnecessary cognitive strain by automating review timing, freeing working memory for deeper processing which entails the enhancement of memory encoding (Sweller, 2019; Sweller et al., 2019).

The superior short-term recall performance in the AI-enhanced group can be attributed to the adaptive and interactive features inherent in AI-based learning systems. Consistent with Sun and Wang's (2020) findings, the integration of multimedia elements in AI platforms appears to heighten learner motivation and attentional focus, both of which are critical for initial vocabulary encoding. Furthermore, the ability of AI systems to contextualize vocabulary within profession-specific scenarios (Wang & Vásquez, 2021) likely enhances depth of processing, leading to more robust short-term retention. This underscores the importance of situated learning in ESP contexts, where lexical items must be mapped onto real-world occupational frameworks to ensure meaningful acquisition.

The long-term memory retention observed in this study support the contention that AI-driven instruction fosters durable lexical retention as a finding that resonates with Zhang and Zou's (2020) work on spaced repetition algorithms. By systematically reintroducing target vocabulary at empirically optimized intervals, AI tools appear to counteract the natural decay of memory traces, facilitating consolidation in long-term storage (Kohnke & Mooorhouse, 2021). Additionally, the dynamic recalibration of content difficulty based on learner performance ensures sustained cognitive engagement without inducing overload, aligning with principles of cognitive load theory (Sweller, 2019; Sweller et al., 2019). This dual mechanism of spaced repetition coupled with adaptive difficulty may explain the experimental group's sustained advantage in the delayed post-test.

The differential success of AI-enhanced instruction may also stem from its capacity to stimulate authentic language use through natural language processing (NLP) capabilities. The AI tool employed in this study (Diffit) operationalized this principle by generating domain-specific texts, vocabulary lists, student activities, and a variety of multimedia supplements thereby narrowing the gap between decontextualized classroom learning and real-world language demands. This contextualization likely promoted deeper

semantic encoding which is instrumental for both recall and retention.

The findings the current study, nevertheless, contradict several recent studies that questioned the efficacy of AI for vocabulary learning. For instance, Bastani et al. (2024) reported that learners using AI platforms performed worse than those using traditional methods possibly due to over-reliance on AI as a learning tool. Likewise, Machin-Mastromatteo (2023) concluded that while AI can support language learning, it often fails to promote deeper retention or meaningful gains in vocabulary among certain learner groups. Trabelsi (2025) also highlighted negative or negligible effects of AI vocabulary retention, attributing to a lack of learner engagement and critical thinking when relying on AI-generated content.

Several factors may explain these contrasting outcomes. First, the current study focused on ESP learners, who may possess higher intrinsic motivation and more targeted vocabulary goals than general language learners, making them more likely to benefit from focused AI activities. Additionally, AI interventions in this study were structured and scaffolded, minimizing the risk of passive learning or over-dependence. Regular feedback and monitoring could have further encouraged active engagement, resulting in stronger vocabulary gains. Lastly, the specific design of AI tasks centered on authentic, discipline-specific contexts may have boosted relevance and retention compared to broader AI interventions described in prior work.

Overall, these findings suggest that when thoughtfully integrated and tailored to learner needs, AI can substantially support ESP vocabulary development even where previous studies found little benefit. Further research should continue exploring which conditions and learner profiles maximize the advantages of AI language learning.

6. Conclusion

This study offers robust empirical evidence supporting the efficacy of AI-enhanced instruction in facilitating vocabulary recall and retention among ESP learners. The findings highlight the transformative potential of AI-driven tools in delivering personalized, adaptive, and contextually rich learning experiences tailored to the special needs of ESP

students. Theoretically, these findings reinforce the applicability of cognitive load theory and depth of processing models to AI-mediated vocabulary learning.

Practically, they emphasize the potential of AI tools to address persistent challenges in ESP instruction in Iran, particularly in settings where traditional methods fail to deliver contextualized, retention-focused training. Most importantly, policymakers should prioritize funding for AI-driven platforms that support adaptive vocabulary instruction, particularly in ESP contexts where domain-specific lexical mastery is critical. This includes providing institutional access to AI tools with spaced repetition, contextual learning, and personalized feedback features. For curriculum designers, the study underscores the value of integration of adaptive AI systems into ESP curricula to support both immediate lexical access and long-term retention. ESP programs should be redesigned to include AI-mediated vocabulary modules, ensuring alignment with ESP communication needs. AI can supplement traditional methods by offering real-world simulations, dynamic assessments, and self-paced learning pathways.

In the current study, several limitations need to be acknowledged. First, the relatively small size (N=48) may constrain the generalizability of the findings, suggesting the need for replication studies within larger and more diverse cohorts. Second, while the study focused specifically on lexical acquisition, it did not examine other critical dimensions of language proficiency such as grammatical accuracy or oral fluency. Future investigations could productively explore the impact of AI on these under examined competencies. Additionally, the retention period assessed in this study was limited to twelve weeks; longitudinal research spanning extended durations would help ascertain the durability of AI-enhanced learning outcomes.

To advance this line of inquiry, several promising research directions emerge. First, the relationship between AI-mediated instruction and learner autonomy warrants systematic investigations. Although AI platforms provide individualized learning pathways, the degree to which they foster or constrain self-regulated learning strategies remains an open question. Second, comparative studies examining blended learning models where AI tools are strategically integrated with conventional pedagogical approaches could yield valuable insights for optimizing instructional design. Finally,

qualitative explorations of learner experiences with AI systems may illustrate the affective and cognitive processes underlying vocabulary acquisition in technology-enhanced environments. Future research should explore the practicality of such interventions across diverse ESP domains and learner populations.

In conclusion, this study makes a substantive contribution to the burgeoning literature on AI in second language acquisition, particularly within ESP contexts. By empirically validating the benefits of AI-enhanced vocabulary instruction, it underscores the affordances of AI to address persistent challenges in specialized language education. However, as with any emerging pedagogical innovation, these findings should be interpreted as preliminary rather than definitive. Continued interdisciplinary research spanning applied linguistics, educational technology, and cognitive science will be essential to fully realize transformative potential of AI while addressing its current limitations. The present study thus serves as both a foundation for future inquiry and a call for more nuanced investigations at the intersection of artificial intelligence and language pedagogy. It not only advances the discourse on AI in ESP education but also invites broader reflection on how emerging technologies can reshape Teaching English as a Foreign Language (TEFL) by balancing efficiency with pedagogical depth—ensuring that AI serves as a tool for meaningful language learning rather than a mere technological quick fix.

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Appendix

Sample Items from Vocabulary Test

From the book "Check Your English Vocabulary for Leisure, Travel, and Tourism" authored by Wyatt (2007)

-Application form	- driving license	- hotel voucher	- food hygiene certificate
-Flight coupon	- claim form	- ID card	- customer satisfaction questionnaire
-Baggage check	- exit visa	- landing card	- health declaration form
-Boarding pass	- form E 111	- passport	- certificate of seaworthiness
- transit visa	- ticket	- multiple-entry visa	- property irregularity report
- revalidation sticker	- work permit	- rental agreement	- certificate of airworthiness
- travel insurance	-vaccination certificate	- docket	- clearance certificate
- landing card	- receipt	- travel voucher	

1. Your flight to Tokyo has a 12-hour layover in Moscow. If you want to leave the airport and visit the city, you will need a ---------, which you can get from the Russian embassy before you leave.
2. Ladies and gentlemen, We will shortly be arriving in Athens. Non-EU citizens will need to fill in a ---------- before going through immigration, and we will be handing these out now.
3. This is an advance purchase, promotional, round trip, off-peak, non-endorsable, non-transferable, non-refundable, economy class, maximum stay, open-ended ----------. Do you think you can remember that?
4. At the airport, go to the check-in, show them your ticket, give them your baggage and collect your ----------, which will show your seat number, boarding time and gate number.
5. At the reception, give the receptionist your ----------. This shows that you have booked and paid for your room. It also shows that breakfast is included in the price.
6. When a customer buys a package holiday, the tour operator will often send ---------s to the airline, the hotel, etc. to pay for the holiday.
7. European Union residents visiting other European Union countries can get free or reduced-cost medical assistance if they have a ---------- with them.
8. You should always have ---------- when you go on a trip, just in case you lose something valuable, have something stolen or need medical treatment.
9. Some countries will not let foreigners in if their ---------- is valid for less than six months. If this applies to you, you will need to fill in an ---------- for a new one.
10. There are two parts to your airline ticket: the ----------, which the check-in staff keep, and the receipt, which you keep with you.
11. When you hire a car, it is very important to read the ---------- very carefully before you sign it. You will also need to show your ----------.
12. In a lot of countries, you need to carry an ---------- at all times, so that you can prove who you say you are.
13. Before you start a job in another country, it is usually essential to obtain a ----------.

14. All aircrafts must have a ---------- before they are allowed to fly. Similarly, a ship must have a ---------- before it is allowed to sail.
15. Goods that go from one country to another have to be accompanied by a ---------- to show that they have been passed by customs.
16. Some countries may require foreign visitors to have a ---------- that shows they are immune to certain diseases that they could catch in that country before they will let them in. others may ask to see a ---------- to show that visitors are in good health and free from contagious diseases.
17. If an airline loses a passenger's baggage, they will ask him to fill in a ----------, describing the item of baggage and its contents. The passenger should give this form, together with his ---------- (which shows that his baggage was checked in by the airline) to a member of the ground crew.
18. In many countries, a restaurant needs to have a ---------- to show that it meets national standards of cleanliness.
19. Travel companies often ask their guests to fill in a ---------- at the end of their holiday so that they can find out if they need to make any changes or improvements to the way they operate.
20. If you have something stolen while on holiday and want your insurance company to replace it, you will need to fill in a ---------- describing what was stolen and how much it was worth.
21. When you buy something, you should always ask for, and keep the ---------- in case you need to return it.
22. When the hotel takes a delivery of something, it is important to check the accompanying ---------- to make sure that everything the hotel ordered is there.
23. If an airline passenger decides to change her flight times or another aspect of her flight, it is not always necessary to give her a new ticket. Sometimes a ---------- is placed on her original ticket to show that a change has been made.
24. This is a ----------, which means that you can enter and leave the country as many times as you like during a specific period.
25. Some countries require travelers to have an ---------- before they let them leave the country.

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Pyramid model of willingness to communicate versus communicative tasks: Can they reduce EFL learners' speaking barriers?

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Abstract

The present explanatory mixed methods study was designed to investigate the difference between the effects of using the pyramid model of Willingness to Communicate (WTC) and Communicative Tasks (CTs) on reducing Iranian English as a Foreign Language (EFL) learners' speaking barriers. The participants were 57 Iranian EFL learners selected based on convenience sampling from a language institute in Tehran. The Preliminary English Test (PET) results verified their homogeneity. To foster a stronger spirit of cooperation among the participants, they were placed in three different classes based on their tendencies; hence, the researchers could consider them as three groups: the Pyramid Model Group (PMG), the Communicative Tasks Group (CTsG), and the Conventional Approach Group (CAG) each including 19 participants. The PMG received instructions pertaining to the six levels of PM in willingness to communicate (WTC), while the CTsG received instructions based on information gap, reasoning gap, and opinion gap activities. The CAG relied on the Audio-Lingual Method (ALM), which the institute regularly followed. Accordingly, the three groups went through pretesting, intervention, and post-testing. The participants completed a speaking barriers survey as pre- and post-tests. Then, ten participants from the three groups were randomly selected and interviewed about the impact of the methods they had experienced on their speaking barriers. The Analysis of Variance (ANOVA) revealed the priority of the pyramid model of WTC over communicative tasks and conventional teaching in reducing learners' speaking barriers. The interview results also confirmed the quantitative findings indicating that anxiety, learners' low self-confidence, along with linguistic and instructional barriers could be reduced through being exposed to the pyramid model instructions. The results can be helpful for ELT professionals, EFL teachers and learners, and other stakeholders to hold more thriving L2 speaking classes.

Key Words: Communicative Tasks, Iranian EFL Learners, Pyramid Model of WTC, Speaking Barriers, Speaking Skill

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1. Introduction

Second language speaking, as the primary mode of communication, is essential, as it enables learners to interact with people in various settings and express their ideas and opinions. However, improving students' ability to communicate while fostering their growth as contributing members of the target language-learning community has always been challenging (Fisher et al., 2024; Koutska, 2024). Despite their high communication efforts, many students have voiced dissatisfaction with mastering the skill. Understanding the challenges faced by L2 learners has long been a focal topic of research and practice (Baker, 2015). Most of such challenges are rooted in speaking barriers individuals face when practicing L2 speaking (Alhmadi, 2014; Farokhi Pour et al., 2018; Ismiati, 2021; Wei & Zhang, 2013). Issues such as shyness and lack of self-confidence can prevent students from speaking in the classroom and impede the development of their skills (Rashtchi & Keyvanfar, 2002; Sadeghi & Maleki, 2015). Sawir (2005) categorized the challenges faced by Asian students in learning English into linguistic, instructional, and affective barriers, as well as a lack of support, all of which stem from psychological or social factors. Additionally, factors such as excessive dependence on teachers, a low level of autonomous learning practices, and language transfer issues may pose challenges for learners (Wei & Zhang, 2013).

Speaking barriers are situations or affective obstacles that impede effective communication and can obstruct or prevent students from communicating smoothly (Ismiati, 2021). Among speaking barriers, anxiety, low self-confidence, deficiency in L2 vocabulary knowledge, and minimized self-assertiveness have been highlighted (Hashemifardnia et al., 2021; Ismiati, 2021; Wei et al., 2013). In the same vein, it is argued that a lot of EFL learners demonstrate low speaking proficiency (Al-Tamimi, 2014; Ismiati, 2021; Sayed, 2015), are weak in producing connected speech (Karimpour & Chopoghlou, 2014), experience speaking anxiety (Farokhi Pour et al., 2018; Sadighi &Dastpak, 2017), and present their ideas unconfidently (Abedini & Chalak, 2017). Therefore, several factors influence EFL learners' ability to present their ideas, start effective communication, or act efficiently in classroom debates and discussions.

Iranian EFL learners often experience anxiety when speaking publicly in formal presentations or participating in group discussions (Abedini & Chalak, 2017;

Hashemifardnia et al., 2021). A lack of confidence in one's language skills and inadequate listening and speaking abilities are the basic causes of this reluctance to speak up and communicate effectively (Ayawan et al., 2022; Farokhi Pour et al., 2018).

Communicative tasks (Burns, 2019; Mirsane & Khabiri, 2016; Richards, 2006; Savignon, 2005) and the pyramid model of WTC (MacIntyre et al., 1998; Henry & MacIntyre, 2023; MacIntyre & Wang, 2021; Piechurska-Kuciel, 2021) are among the approaches that have been proposed as effective in teaching second language speaking. Instead of viewing WTC as a trait-like variable, the heuristic pyramid model of WTC expands its scope. WTC is viewed as a situational variable with both temporary and enduring factors due to its social effect (McIntyre et al., 1998). The willingness to engage in a conversation with a specific individual or individuals at a specific time while using a second language is thus described as "L2WTC" (McIntyre et al., 1998, p. 547).

This study employed the Willingness to Communicate (WTC) perspectives (Burgoon, 1976; McCroskey & Baer, 1985; McIntyre et al., 1998; McIntyre, 2020) as its theoretical framework. The pyramid model serves as a meeting point between learner psychology and second language learning. When the "deep, personal relevance of the topics under discussion" influences speakers' motivations and emotions, "WTC changes" (MacIntyre & Wang, 2021, p. 878). This indicates that, regardless of the task types and activities used in the L2 classroom, learners might not progress in their second language unless they are mentally and cognitively engaged with the discussion topics or learning outcomes (MacIntyre, 2020).

Moreover, research findings indicate that within the domains of Task-Based Language Teaching (TBLT) and Communicative Language Teaching (CLT), CTs are effective in promoting the L2 speaking quality of ESL/EFL learners (Hasnain & Halder, 2021; Pakula, 2019; Purwati et al., 2023; Rashidova, 2023). The CTs employed in communicative language teaching can be used to help EFL learners improve their speaking skills. CTs encompass activities that promote and necessitate the use of spoken and unspoken language among learners, such as expressing oneself, repairing breakdowns in communication, learning about the target community's cultural aspects, and enhancing mutual understanding (Nunan, 2006). As the previous studies have not compared the effects of PM of WTC and CTs on EFL learners' speaking barriers (i.e.,

linguistic, psychological, and external factors), the present study attempted to fill this gap through a mixed methods study.

2. Review of the Related Literature

Emotions, as an inseparable component of WTC, play a significant role in the speaking performance of L2 learners. The negative correlation between WTC and anxiety (MacIntyre & Gregersen, 2022) shows the role of emotions in learners' success in speaking. According to MacIntyre and Wang (2021), WTC evolves when the profoundly personal significance of the subjects being discussed impacts speakers' motives and emotions. Alhmadi (2014) showed that in addition to the poor teaching methods, the lack of sociocultural and socio-psychological factors in teaching speaking are barriers to L2 speaking development. Lodhi et al. (2019) also showed that female students presented superior speaking skills in private situations compared to male and female students speaking in public.

The pyramid model of WTC, as presented by McIntyre et al. (1998), is a re-conceptualized framework that views learning as a situational construct shaped by both transient and enduring variables. In this model, WTC in an ESL or EFL context is defined as “a readiness to enter into discourse at a particular time with a specific person or persons, using a L2” (p. 547). According to McIntyre et al. (1998), it offers a heuristic perspective on second language communication by integrating communicative, social psychological, and linguistic characteristics.

A socio-emotional educational interpretation of the pyramid model, suggested as a promising approach within the ELT field (MacIntyre & Wang, 2021), incorporates not only sociocultural considerations but also cognitive elements. This approach has been employed by researchers such as Kim (2014) and Piechurska-Kuciel (2021), who used the model to enhance EFL learners' L2 development within psychologically supportive and learner-centered programs.

Moreover, the pyramid model has been recognized for its significant influence on learners' L2 development across real-life, virtual, and multicultural learning contexts (Fernández-García & Fonseca-Mora, 2019; Kruk, 2022; Lee et al., 2022). Several studies

have also demonstrated the model's positive effects on increasing learners' grit, growth mindset, positive emotions, trust, and self-image, while simultaneously reducing anxiety and negative feelings (Lee & Liu, 2022; MacIntyre & Gregersen, 2022).

In practice, the complex and dynamic nature of the pyramid model has been emphasized by MacIntyre and Wang (2021), who found that this dynamicity fosters a sense of achievement among learners in L2 classrooms. Furthermore, MacIntyre et al. (2022) highlighted that teachers' application of the pyramid model plays a vital role in reducing learners' stress, enhancing their coping mechanisms, and supporting overall well-being.

Additionally, the communicative strategies presented through CTs in training L2 speaking performance play a decisive role in enhancing learners' speaking performance. Shirazifard et al. (2022) found that task-based collaborative dialogues enhance EFL learners' speaking proficiency, as these tasks help learners communicate effectively with their peers. Emphasizing the role of emotions, MacIntyre et al. (2022) argued that teachers' hope is decisive in reducing their learners' stress, enhancing cooperation among learners, and increasing their well-being. Kruk (2022), who studied the dynamicity of WTC, L2 motivation, anxiety, and boredom among advanced EFL learners, found that positive factors such as the attractiveness of speaking topics, common interest discussions, and mutual understanding of ideas might promote WTC among learners.

However, negative factors such as unwillingness to speak, past negative experiences, and unpleasant interactions with other L2 users can hinder learners' success in developing L2 speaking skills. To address these challenges and promote more effective communication, EFL and ESL teachers are encouraged to employ various communicative tasks (CTs) —including opinion gap, information gap, and reasoning tasks— that actively engage learners in meaningful interaction (Rashidova et al., 2023). In the Iranian context, several studies have identified key barriers to speaking, such as language anxiety (Farokhipour et al., 2018; Sadighi & Dastpak, 2017), fear of negative evaluation from teachers and peers, low self-confidence, and an unsupportive classroom atmosphere (Abedini & Chalak, 2017). In addition, other research has highlighted the impact of linguistic and instructional barriers on speaking performance (Hashemifardnia et al., 2021; Sadighi & Dastpak, 2017). In the present study, the Speaking Barriers Survey

(Ismiati, 2021) was used to assess EFL learners' speaking challenges across two dimensions: psychological factors (e.g., lack of self-confidence, anxiety, and classroom effect) and performance condition factors (e.g., time pressure, classroom atmosphere, lack of practice, and instructional barriers).

Given the importance of L2 speaking skills for EFL learners and the potential role of reducing speaking barriers in developing these skills, this study had two main objectives. First, it aimed to compare the effectiveness of the pyramid model of Willingness to Communicate (WTC) and communicative tasks (CTs) in reducing speaking barriers among Iranian EFL learners. Second, using a sequential explanatory mixed-methods design, the study sought to explore EFL learners' perceptions of how the pyramid model of WTC and CTs influenced their speaking barriers. To achieve these objectives, the researchers formulated the following research questions:

1. Is there any significant difference between the effects of the pyramid model of WTC and communicative tasks on reducing Iranian EFL learners' speaking barriers?

2. What are the students' attitudes toward the impacts of performing the pyramid model of WTC and communicative tasks on their speaking barriers?

3. Method

3.1. Design

The researchers employed an explanatory sequential mixed-methods design, incorporating a quasi-experimental approach in the quantitative phase using a non-equivalent control group pretest-posttest design. Following Field (2024), control was maintained to examine the effect of the study's independent variable—implemented in two modalities (the pyramid model of WTC versus communicative tasks)—on the dependent variable, which was EFL learners' speaking barriers. In the qualitative phase, consistent with Maxwell (2022), data were collected through interviews with 10 randomly selected EFL learners from all groups. Thus, the study integrated both quantitative and qualitative data collection and analysis procedures (Creswell & Plano Clark, 2023).

3.2. Participants

In the quantitative phase of the study, using convenience sampling, 57 intermediate-level female EFL learners were selected from a pool of 70 students enrolled at a language institute in Tehran. These participants, aged between 18 and 25, were chosen based on their scores on the Preliminary English Test (PET), with only those falling within one standard deviation above and below the mean included to ensure homogeneity. The PET results confirmed that the participants were relatively uniform in language proficiency. They were then randomly assigned to three groups: the Pyramid Model Group (PMG), the Communicative Tasks Group (CTsG), and the Conventional Approach Group (CAG), with 19 participants in each.

In the qualitative phase, ten participants from both the experimental and control groups were randomly selected for interviews. These individuals had indicated their willingness to participate by checking the appropriate box during the posttest phase. The interviews aimed to explore their perspectives on the impact of the pyramid model of WTC and communicative tasks on their speaking barriers.

3.3. Instrumentation

The data were collected using a standard Preliminary English Test (PET), a speaking barriers questionnaire (Ismiati, 2021), and an interview scheme. The PET was used to ensure participants' homogeneity. In their study, Orozco and Shin (2019) used the Pearson correlation coefficient to examine the reliability of the PET's writing and speaking sections across raters. The writing section had an inter-rater reliability of $\alpha = 0.83$, while the speaking component had an inter-rater reliability of $\alpha = 0.80$ (p. 7). Additionally, they mentioned that confirmatory component analysis verified the test's construct validity.

The Speaking Barriers Survey (Ismiati, 2021) was administered before and after the intervention. The Likert scale survey comprised 15 items, measuring EFL learners' speaking barriers in terms of Psychological Factors (items 1-8, such as lack of self-confidence, anxiety, and classroom effect) and Performance Condition Factors (items 9-15, such as time pressure, lack of practice, and instructional barriers) as its two components. The estimated reliability of the survey, as measured by Cronbach's alpha,

was 0.89, and its construct validity has been verified through factor analysis (Ismiati, 2021, p. 38). The current researchers also estimated the reliability of the instrument using Cronbach's alpha reliability coefficients in the pretest (α = .89) and the posttest (α = .724).

In line with Van Katwijk et al. (2022), the researchers employed a semi-structured interview to gather data on EFL learners' views regarding the impact of methods and techniques used in each of the three study groups on reducing their speaking barriers. Before the semi-structured interview, the researchers developed general questions based on a thorough literature review. Then, the interview questions were checked and piloted with 10 EFL learners. Moreover, in line with Creswell and Plano Clark (2017), the interview questions were reexamined by two TEFL PhD holders to ensure the appropriateness of content and language (credibility). As a result of some modifications, two items were removed, and an item was added, resulting in six prompts in the final version of the interview questions (see the Appendix). Following Dörnyei's (2007) framework, the researchers obtained the consent of the participants in advance while ensuring their anonymity. During the interviews, the interviewees' sense of autonomy was a priority.

3.4. Data Collection Procedure

The data collection procedure was categorized into three phases, as described below.

Phase One: Pretest

In the first phase of the pretest section, the participants of the study were selected. First, the standard version of PET was administered to the participants to homogenize them regarding their general English proficiency. Out of the 70 intermediate level female learners, 57 individuals whose scores fell within one standard deviation above and below the mean were selected as the main participants of the study. The selected participants were randomly assigned to three groups; two experimental groups and one control group. Then, the speaking scores of the participants in the PET were taken into consideration; the means of the learners’ scores were compared together to assure their homogeneity prior to the treatment. After that all the participants in the three groups received the speaking barriers survey (Ismiati, 2021) as the pretest in the study.

Phase Two: Intervention

The intervention took 16 sessions. The PMG received innovative instruction in the speaking skill, relying on the six layers of the pyramid model of WTC as proposed by MacIntyre et al. (1998). Based on the heuristic pyramid model of WTC, EFL learners' willingness to communicate with others would be immediately affected by personal, psychological, and inter-personal factors. Moreover, situational notions, self-confidence, previous experiences, motivation, intergroup behavior, and cultural factors would affect learners' communication quality (MacIntyre &Wang, 2021).

As the first three layers consisted of communication behavior, behavior integration, and situated attendance, it was assumed that these layers would emphasize situational learning and "depict situational influence on WTC" (Waluyo, 2021) and in turn would affect EFL learners' speaking ability and minimize their speaking barriers. One session was dedicated to describe the pyramid model of WTC and its layers. The following three sessions were dedicated to activities such as describing desires, talking about daily issues and asking students give presentations about their lives and feelings. Moreover, to teach the other three layers which dealt with motivational properties, affective-cognitive context, and social-individual context, three sessions were dedicated. These layers were assumed to leave enduring effect on L2 communication processes. So, learners performed the activities which integrated their motivation, problem solving, and establishing network with other students. The other nine sessions of the treatment process were dedicated to practicing, reviewing the materials, and giving feedback to the learners.

The CTsG enjoyed practicing speaking through CTs in line with the principles of TBLT. The researchers used the method and tasks laid out by Prabhu (1987), Ellis (2009), and Nunan (2006). In the present study, the researcher relied on task-supported language teaching which represented a weak version of CLT that usually uses tasks to make language teaching more communicative (Ellis et al., 2019). The first three sessions were dedicated to teach information gap, reasoning gap, opinion gap tasks. The other 13 sessions were dedicated to practicing, reviewing and giving feedback to the learners. One of the researchers, who was also the classroom teacher in this experimental group, checked the learners' spoken performances to provide more clarity and assist them with

improving their second language speaking abilities. In order to help students see their own shortcomings and areas for improvement, the instructor employed oral corrective feedback (OCF). Also, pedagogical tasks were used in this experimental group as they were more controlled than the real-life tasks and were used more effectively in the classroom with regard to the current status of the participants' knowledge of L2 speaking.

The CAG was exposed to the institute's conventional method, which relied on speaking and listening, similar to what is usually emphasized in the Audio-Lingual notions, through the course book was the Touchstone Series (McCarthy et al., 2019), book 2, units 1 to 4. Therefore, learners in this group received instructions, practices, exercises, feedback, and assignments on promoting their listening and speaking abilities (Burns & Richards, 2009). The procedure was as follows: (1) the language instructor provided a concise overview of the dialogue's content, (2) the language learners listened attentively as the instructor read or recited the dialogue at a normal pace multiple times, and (3) language learners recited the dialogue either line by line or collectively, depending on its length. The teacher corrected any errors and instructed the learner to repeat the statement (s), and 4) repetition proceeded with progressively smaller groups in the class. Then, the leaners were encouraged to practice speaking in small groups and later talk about their own personal experiences.

Phase Three: Posttest and Interviews

After the intervention, the participants took the speaking barrier survey as the posttest. The next step was collecting the students' opinions on the teaching approach used in each class. The interviews were recorded on a Digital Voice Recorder (DVR), transcribed, translated into English, categorized, and then analyzed. Each interview lasted 10 to 15 minutes, while the interviewees received a copy of the questions in advance. The qualitative data obtained from the learners' interviews were analyzed using a content analysis (Strauss & Corbin, 1998).

4. Results

As it was noted earlier, 57 intermediate EFL learners whose scores fell within one standard deviation above and below the mean were selected based on non-random

convenience sampling technique based on their performance on PET pre-test. Table 1 reveals the descriptive statistics of the three groups.

Table 1.

Descriptive Statistics; PET Test by Groups

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Pyramid model	19	32.11	9.921	2.276	27.32	36.89
Communicative task	19	32.74	9.344	2.144	28.23	37.24
Control	19	31.42	9.996	2.293	26.60	36.24
Total	57	32.09	9.598	1.271	29.54	34.63

Table 2 displays the main results of the one-way ANOVA. Based on these results ($F(2, 54) = .086$, $P = .917$, $\omega^2 = .033$, representing a weak effect size) it was concluded that there were not any significant differences between the means of the three groups on the PET test. Thus, it was claimed that they were homogenous in terms of their general language proficiency prior to the study treatment.

Table 2.

One-Way ANOVA; PET Test by Groups

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	16.456	2	8.228	.086	.917
Within Groups	5142.105	54	95.224		
Total	5158.561	56			

4.1. Research Question One

The first research question aimed to find whether there was any significant difference between the effects of the pyramid model of WTC and communicative tasks on reducing Iranian EFL learners' speaking barriers. Prior to the treatment, the three groups were homogenized with respect to the preset of speaking barriers. Hence, a one-way analysis of variances (one-way ANOVA) was run to compare the pyramid model, communicative task and control groups' means on the pretest of speaking barriers.

Before discussing the results, it should be noted that the assumption of homogeneity of variances was retained on the pretest. Table 3 displays the results of the Levene's test. The non-significant results of the test (Levene's F (2, 54) = 2.44, P = .97) indicated that there were not any significant differences between the three groups' variances.

Table 3.

Test of Homogeneity of Variances; Pretest of Speaking Barriers by Groups

		Levene Statistic	df1	df2	Sig.
Pretest	Based on Mean	2.441	2	54	.097
	Based on Median	2.413	2	54	.099
	Based on Median and with adjusted df	2.413	2	41.271	.102
	Based on trimmed mean	2.471	2	54	.094

Table 4 displays the descriptive statistics for the three groups on the pretest of speaking barriers. The results indicated that the pyramid model (M = 48.68, SD = 13.20), communicative task (M = 49.79, SD = 7.01) and control (M = 45.42, SD = 8.09) groups had almost the same means on the pretest of speaking barriers.

Table 4.

Descriptive Statistics; Pretest of Speaking Barriers by Groups

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Pyramid model	19	48.68	13.208	3.030	42.32	55.05
Communicative task	19	49.79	7.013	1.609	46.41	53.17
Control	19	45.42	8.092	1.856	41.52	49.32
Total	57	47.96	9.820	1.301	45.36	50.57

Table 5 displays the main results of the one-way ANOVA. Based on these results (F (2, 54) = 1.01, P = .368, ω2 = .001 representing a weak effect size) it was concluded that there were not any significant differences between the means of the three groups on the pretest of speaking barriers. Thus, it was claimed that they were homogenous in terms of their speaking barriers prior to the main study.

Table 5.

One-Way ANOVA; Pretest of Speaking by Groups

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	196.035	2	98.018	1.017	.368
Within Groups	5203.895	54	96.368		
Total	5399.930	56			

A one-way Analysis of Variance (ANOVA) was run to compare the means of the PMG, CTssG, and CAG on the posttest of speaking barriers. Initially, the assumption of homogeneity of variances was ensured. The outcomes of Levene's test presented in Table 6 (Levene's F (2, 54) = 2.51, p =.091) suggested no statistically significant difference between the variances of the three groups.

Table 6

Test of Homogeneity of Variances; Posttest of Speaking Barriers by Groups

		Levene Statistic	df1	df2	Sig.
Posttest Speaking Barriers	Based on Mean	2.511	2	54	.091
	Based on Man	2.358	2	54	.104
	Based on Mean and with adjusted df	2.358	2	49.499	.105
	Based on trimmed mean	2.591	2	54	.084

Table 7 shows the descriptive statistics for the three groups on the posttest of speaking barriers. The results indicated that the PMG (M = 31.37, SD = 5.15) had the lowest mean on the posttest of speaking barriers, followed by the CTsG (M = 38.47, SD = 8.74) and the CAG (M = 44.84, SD=7.08).

Table 7.

Descriptive Statistics; Posttest of Speaking Barriers by Groups

	N	Mean	SD	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
PMG	19	31.37	5.155	1.183	28.88	33.85
CTsG	19	38.47	8.746	2.006	34.26	42.69
CAG	19	44.84	7.089	1.626	41.43	48.26
Total	57	38.23	8.950	1.185	35.85	40.60

Table 8 displays the results of the one-way ANOVA (F (2, 54) = 16.89, p <.001, ω2=.358 representing a weak effect size), indicating significant differences between the means of the groups on the posttest of speaking barriers.

Table 8

One-Way ANOVA; Posttest of Speaking Barriers by Groups

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1726.351	2	863.175	16.890	.000
Within Groups	2759.684	54	51.105		
Total	4486.035	56			

Table 9 displays the results of the post-hoc Scheffe's tests run to compare the groups two by two. The results show a statistically significant difference between the PMG and the CAG (p<.001). A statistically significant difference exists between the CTsG and the CAG (p=.029). Additionally, a significant difference is observed between the PMG and CTsG (p = .013), suggesting that the pyramid model of WTC implemented in the current study could reduce participants' speaking barriers. Employing tasks for improving the learners' speaking was also more effective than typical practices derived from the conventional method used in the control group.

Table 9

Multiple Comparisons; Posttest of Speaking Barriers by Groups

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
CAG	PMG	13.474*	2.319	.000	7.64	19.31
	CTsG	6.368*	2.319	.029	.53	12.21
CTsG	PMG	7.105*	2.319	.013	1.27	12.94

*. The mean difference is significant at the 0.05 level.

Research Question Two

The second research question aimed at finding the students' attitudes toward the impacts of performing the pyramid model of WTC and communicative tasks on their speaking barriers. The interviews helped the researchers to collect qualitative data to answer this question. Ten learners from the three groups were interviewed after the intervention. Out of the six questions in the interview, three of them covered topics related to reducing speaking barriers. Hence, answers given to items 1 (asking learners to provide their assessment of the instructional approach employed by their instructor in the classroom), 4 (asking learners to talk about whether they can employ classroom learning in the outside world), and 6 (requesting learners to put anything else they would like to add about their classroom experiences), were taken into account to be reported in this paper.

Table 10 categorizes the ideas of ten EFL learners from each group regarding their classroom practices. As the table indicates, 90% of the interviewees in PM group reported experiencing a pleasant atmosphere in the class. In comparison, 80% of the CTs group shared the same sentiment, while just 60% of the CAG did so. Regarding motivation, all participants (100%) in the PM group had a high level of motivation in the classroom. In contrast, the CTs group had a lower level of motivation (70%), and the CAG had the lowest level of motivation (50%). Item 3 elicited from the interviews show that all the PMG learners (100%) took priority over the other two groups (i.e., CTsG= 70%; CAG= 40%) emphasizing students' engagement in discussions regarding their personal life experiences. The same is with items 5 and 7 as the Table shows. However, with respect to actively participating in classroom discussions which required learners to engage in

extensive reading beyond the classroom, 100% of both PMG and CTsG learners had this idea, while only 60% of the learners in the CAG had said so. It is worth noting that 70% of the CAG members found the class boring, while only 40% of the participants in the CTsG had this idea and none of the students in the PMG presented this notion.

Table 10.

Participants' Viewpoints about the Interventions Received

No.	Viewpoint	Frequency			Percentage		
		PMG	CTsG	CAG	PMG	CTsG	CAG
1	The class had a convivial ambiance.	9	7	4	90%	70%	40%
2	The level of motivation in the classroom was substantial.	9	8	6	90%	80%	60%
3	Students engaged in discussions regarding their personal life experiences.	10	7	4	100%	70%	40%
4	The vast majority of learners participated in the classroom activities.	9	8	6	90%	80%	60%
5	To actively participate in classroom discussions, students were required to engage in extensive reading beyond the classroom.	10	10	6	100%	100%	60%
6	In the lesson, the think-aloud protocols and brainstorming approaches were employed.	10	4	2	100%	40%	20%
7	Students have the potential to enhance both their English language skills and their comprehension of the world.	10	7	3	100%	70%	30%
8	The class was tedious.	0	4	7	0.00%	40%	70%

Table 11 summarizes the ideas presented by learners about how they could employ classroom learning in the outside world. Nearly all interviewees shared similar views regarding utilizing classroom instruction for academic goals, reading literary works, viewing films, listening to music, traveling abroad for business or pleasure, and communicating. Besides, a few students suggested applying what they learned in class to email and online activities. Table 11 summarizes the opinions of the ten students chosen randomly from each group.

Table 11.

Student Views about Using Classroom Learning in the Outside World

No.	Views	Frequency (f)			Percentage		
		PMG	CTsG	CAG	PMG	CTsG	CAG
1.	Utilizing classroom instruction for academic goals	9	8	9	90%	80%	90%

2. Reading literary works	8	8	8	80%	80%	80%
3. Viewing films and listening to music	9	8	9	90%	80%	90%
4. Traveling abroad for business or pleasure	8	9	9	80%	90%	90%

Table 12 presents the learners' overall experiences with the method they were exposed to in each of the three groups taking part in the experiment. In this study, students from all three groups gave thoughtful accounts of the benefits they had received from prior use of specific educational approaches and strategies.

Table 12.

Positive and Negative Experiences of the Learners in the Groups

No. Attitudes	Frequency (*f*)			Percentage		
	PMG	CTsG	CAG	PMG	CTsG	CAG
Exhibiting a high degree of friendliness	70	80	60	70%	80%	60%
Creating a motivating atmosphere for learners to continue	80	70	60	80%	70%	60%
Utilizing films, video snippets, and instructional materials	80	70	50	80%	70%	50%
Prioritizing second language speaking	80	70	60	80%	70%	60%
Imposing rigorous workload on pupils	10	20	60	10%	20%	60%

When asked about their impressions, students in the PMG overwhelmingly expressed that the classes were friendlier and more enjoyable than their prior experiences. They also emphasized the potential for gaining more information and knowledge during the semester compared to prior semesters. In addition, they were highly motivated to study in class and made explicit links between class and outside activities. It is worth mentioning that weak students in the three groups reported feeling exhausted from completing the assignments.

A remarkable aspect of the negotiated syllabus emphasized in the pyramid model is the inclusion of shared decision-making. This approach encourages all students to actively participate and contribute to the decision-making process. Nevertheless, the perspectives of the most outspoken individuals appear to be acknowledged, rather than those who remain silent and refrain from expressing their viewpoints. Regrettably, the individuals who were less engaged in learning in the current study were part of the second group.

5. Discussion

The results showed notable disparities in the means of the posttest scores for speaking barriers among the CTsG, PMG, and CAG, indicating that the PMG exhibited the lowest average score on the posttest measuring speaking barriers. The qualitative results were consistent with the quantitative results, providing further evidence that using the pyramid model may be more effective than the communicative tasks and the ALM.

The success of the pyramid model of WTC in minimizing EFL learners' speaking barriers could be due to personal, social, and interpersonal factors of the model, which can pave the ground for less anxiety and more willingness to communicate. In line with MacIntyre and Wang (2021), the current researchers argue that cultivating mutual communication through the model could facilitate improving the speaking ability of EFL learners by reducing the speaking barriers such as anxiety and demotivation, while enhancing their motivation to speak and WTC.

Moreover, the present study findings imply that pyramid model phases can minimize L2 speaking barriers such as deficiency in autonomous ability, constructing discourse, negative transfer of mother tongue, developing thought patterns, and choosing proper words and expressions, which greatly hinder EFL learners' oral English learning. These findings highlight what Wei and Zhang (2013), in their study of oral communication barriers of Chinese students, have found, though they did not focus on the pyramid model.

In addition, Ayawan et al. (2022) argued that speaking techniques relying on actions taken to solve problems through developing a friendly network, exchanging information, and constructing discourse can reduce speaking barriers such as anxiety and low motivation to communicate. Developing positive emotions in the L2 classroom can boost learners' communication skills and encourage them to share information, thoughts, and feelings through verbal and non-verbal exchange. The Pyramid Model improves learners' communication skills and, as proposed by MacIntyre et al. (2022), might improve learners' self-esteem, motivation, and self-expression. Moreover, as psychological factors such as L2 learners' lack of confidence and motivation have been found as significant barriers to speaking for EFL learners (Purwati et al., 2023), paying attention to "Affective-Cognitive Context" in the pyramid model is likely to be a solution to the problem. By

practicing language functions and speech acts, learners are motivated to speak more enthusiastically. As MacIntyre and Wang (2021) argued, minimizing the affective-cognitive barriers would facilitate communication.

Some studies have shown that among the linguistic barriers to L2 speaking promotion, the lack of vocabulary, pronunciation, and negative feedback from learners' peers play significant roles (Abrar et al., 2018; Ayawan et al., 2022; Purwati et al., 2023). A lack of vocabulary repertoire could make people feel less comfortable when they speak (Chou, 2018), which can be one of the reasons why some learners avoid using the English language in the L2 classroom (Salam et al., 2021). Teaching communication skills relying on the Pyramid Model can help EFL learners know their own and others' emotions and evaluate them carefully to get more social and emotional support from their environment. Besides, learners with low academic adjustment cannot consider others' perspectives. Such people often lack the necessary communication skills in society. Through enchaining social interaction, interpersonal relations, motivation, integrated behavior, and affective-cognitive notions, which are embedded in the pyramid model of WTC, teachers can compensate for the learners' weak function by enhancing their instrumental motivation to succeed.

In line with Alhmadi (2014) and Ismiati (2021), not being able to connect one's classroom learning to one's personal life has been mentioned by the interviewees as another speaking barrier. As the participants mentioned, "situated attendance" can open the door to personalized classroom learning. Thus, the model can encourage L2 learners to share their thoughts and feelings about current events, their lives, and the social environment in which they occurred. The dynamic intervention of teachers and peers can help learners overcome their learning anxiety (Farokhi Pour et al., 2018; Ismiati, 2021).

Another source of barrier impeding L2 learners' oral communication is anxiety (Akbari, 2015; Farokhi Pour et al., 2018), which can cause problems in learning and studying foreign languages (Al-Hakim & Syam, 2019). Anxiety scatters and confuses thoughts, disrupts the coherence of the mind, slows down the learning process, and produces academic stagnation. As an extensive and pervasive characteristic that accompanies a person from the first days of childhood to old age, anxiety can impede

learners' performance in EFL classes (Damayanti & Listyani, 2020). However, WTC levels manifested in the pyramid model facilitate positive relationships with others, foster a sincere and reassuring atmosphere, and prevent the emergence of uncompromising behaviors. For example, teaching adaptability, which reflects a person's constructive interaction with others, especially friends and peers, helps students understand and accept many psychological characteristics of themselves and others.

Communicative Tasks (CTs), similar to the tasks supported by the pyramid model of WTC, encompass different activities that promote and necessitate a learner to engage in speaking and listening with other learners, as well as with individuals in the educational program and community. Communicative tasks serve practical objectives such as gathering information, overcoming obstacles, discussing personal experiences, and acquiring cultural knowledge (Nunan, 2006). By incorporating communicative tasks into their teaching, teachers can help EFL learners reflect on their language use and overcome speaking obstacles they encounter daily (Ayawan et al., 2022).

The present study findings, however, might lead to a misunderstanding about the role of communicative tasks in the L2 classroom. Compared with the pyramid model, communicative task training was less attractive for EFL learners; however, a distinct line separating these two techniques cannot be drawn. The major departure seems to lie in the broad scope the pyramid model gives to the linguistic, communicative, and social-psychological characteristics in L2 communication. McIntyre et al. (1988), proposing their heuristic model, argued that "Situational influences" and "enduring influences" can be considered as two distinct ways in which each of the pyramid model's variables is supposed to affect WTC. This view provides the pyramid model with the capacity to encompass any task that serves communication. Based on the results displayed in the Table 9, the PMG outperformed the other two groups (i.e., CTsG and CAG) in reducing speaking barriers. In fact, the mean difference between the PMG and CAG (13.474) and between the PMG and CTsG (7.105) shows that the pyramid model group could significantly minimize the factors such as anxiety and low confidence which could bring about speaking barriers.

The students should be put at the center of the teaching process while teaching

L2 speaking to overcome the speaking hurdles. Teachers should assist students in developing their ability to think in English, boost their enthusiasm, overcome issues their mother tongue causes, speak English flexibly depending on the occasion, make appropriate use of the environment and instructional tools, and actively follow directions. Additionally, students should avoid adopting a passive attitude and show compassion when studying spoken English; thus, professors should inspire students appropriately and get them interested in the materials taught while ignoring their concerns. To address the phonological and cognitive issues, teachers should give sufficient materials for learners to emulate in spoken English lessons.

6. Conclusion

This study initially showed that the pyramid model significantly reduced speaking barriers among Iranian EFL students compared to the CTs and conventional methods. Thus, the PMG exposed to the innovative syllabus outperformed the other two groups. The pyramid model of WTC considers six levels of communication behavior: behavior integration, situated attendance, motivational properties, affective-cognitive context, and social-individual context. The purpose of this article was twofold: To provide a theoretical foundation for classroom implementations of teaching foreign language speaking to remove the barriers and, secondly, to identify lines of inquiry for further study into the teaching and learning of speaking in foreign language classrooms. The current study suggests that the pyramid model highlights the "social-individual context" in which the interpersonal and intrapersonal notions take significance. Accordingly, to reduce the learners' speaking barriers, such as fear of the peers' judgments, ridicule, and low self-confidence, which are labeled psychological barriers.

The next factor emphasized in the pyramid model is affective-cognitive context. Social networks have expanded based on trust, and by relying on affective-cognitive information, knowledge can be transferred to an individual by making it more manageable. The data analysis from different studies also indicates significant correlations between the affective-cognitive, metacognitive, and second-language-speaking domains (Abrar et al., 2018; Aubrey et al., 2022; Rost, 2014). Also, a positive

and significant correlation exists between language ability and the use of cognitive, metacognitive, and social strategies. Besides, the correlation between reflective style and metacognitive, social, and emotional strategies is positive and significant (Karaoglan-Yilmaz et al., 2023). Hence, the attention paid to the affective-cognitive context in the pyramid model is justified and stressed.

The third element focused on in the pyramid model of WTC is motivational properties. The barriers to second language speaking would be minimized by enhancing motivation. Moreover, the dynamicity of perceived WTC affects the enhancement of motivation and reduces boredom and anxiety in the L2 speaking classroom practices.

The fourth component of the pyramid model, known as situated attendance, involves requesting students to do oral presentations in the classroom regarding current events, their own experiences, and their emotions related to recent occurrences within their immediate social environment, among other topics (Saleem et al., 2021). Such activities are expected to increase the sociolinguistic and pragmatic competencies of the learner (Swain, 2000).

The fifth factor emphasized in the pyramid model of WTC" (MacIntyre & Wang, 2021), behavior integration, was practiced by asking students to talk about their desires. For example, they were asked to talk about what impedes them from negotiating with others and why they like or do not like to talk to them. Such questions were posed to make students think about their behavior integrations. Although spoken language is considered an independent language based on the pyramid model, cognitive support for learning L2 speaking and minimizing speaking barriers are bound to the integration of behavior among group members. It is likely that through cooperation and collaboration-oriented activities, learners get integrated in their problem-solving abilities, discussing language concepts and increasing their level of expertise in language use.

The sixth factor developed by MacIntyre and Wang (2021), which falls at the top of the pyramid, is labeled as communication behavior. It manifested in employing the classroom outcomes in their speaking practices and discussing different topics while trying to convey what they have in mind as clearly as possible. In this way, students are able to give presentations on a variety of subjects, debate and discuss topics in English,

and, ideally, use what they have learned in social media to make friends from all over the world, watch movies, solve everyday problems, and generally have fun in the English-speaking world. Accordingly, within the domain of the pyramid model of WTC, learners' anxiety and fear, as the psychological barriers impeding L2 speaking performance, will be minimized.

This study implies that EFL learners' exposure to various techniques and strategies derived from the pyramid model can help them experience less anxiety while enhancing their motivation to engage in speaking, thus minimizing their speaking barriers for better L2 performance. Various strategies from the pyramid model, as outlined in the six steps of this paradigm, could be used by second language teachers to raise their students' awareness of the issues they are facing. The underlying premise is that students learn more effectively when they are actively involved in a project-based learning environment, where they are required to focus on the characteristics of the input they receive and identify any discrepancies between their existing linguistic knowledge and the target-like forms presented. Cognitive comparison, long seen as an essential step in learning a new language, might be the key to accomplishing this. Likewise, EFL learners would notice the gaps and become aware of a mismatch between the input they receive and their current learning, which will help them gain more awareness of what they are supposed to do, reduce their anxiety and boredom, and enhance their strengths. Moreover, in this approach, the interactions within the classroom might be enhanced, which would aid the learners' future second language growth.

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Appendix

Interview Prompts

1. Please provide your assessment of the instructional approach employed by your instructor in the classroom this term.
2. How well have you learned to improve your speaking from the feedback provided by the teacher?
3. Did you (as students) and your teacher negotiate decisions on assignments and activities? How do you feel about that?
4. Can you employ your classroom learning in your daily life?
5. Can you assess your own speaking in terms of grammatical resources, lexical resources, discourse management, pronunciation, and interactive communication?
6. Is there anything you would like to say about the method your teacher used in the classroom in the semester just finished?

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The role of critical pedagogy in developing self-regulated IELTS candidates: A mixed methods study

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Abstract

This study explored the impact of critical pedagogy training for IELTS teachers on their students' self-regulated learning. It also examined the relationship between students' self-regulation and their IELTS performance, as well as how teachers implemented critical pedagogy principles in their classrooms. A mixed-methods research design was used, combining quantitative and qualitative approaches. 30 IELTS teachers and 150 learners from a language school in Tehran were recruited based on non-random convenience sampling technique. Teachers received training in critical pedagogy, after which learners completed a self-regulation questionnaire both before and after the intervention. Language proficiency was assessed using two official IELTS mock tests. Classroom observations and semi-structured interviews with teachers provided qualitative insights into instructional practices. Results showed that learners whose teachers received the training had significantly higher self-regulation scores post-intervention compared to a control group. A positive correlation was found between self-regulation and IELTS performance. Observations and interviews revealed that trained teachers used more dialogic, student-centered methods that promoted autonomy and reflective learning. The findings suggest that critical pedagogy training can effectively enhance both learner autonomy and exam preparedness. These results have implications for improving teacher education and classroom practices in high-stakes language testing environments.

Key Words: Critical Pedagogy, IELTS Candidates, Learner Autonomy, Self-regulated Learning

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1. Introduction

Learning to regulate one's own study habits and strategies is increasingly recognized as vital for success in language learning, especially when preparing for demanding exams like IELTS. Self-regulated learning (SRL) is about more than just studying hard; it involves setting goals, monitoring progress, and adapting strategies as needed (Zimmerman, 2000). These skills help learners become independent and confident, capable of tackling challenges both inside and outside the classroom (Zimmerman, 2008). Unfortunately, many IELTS courses focus heavily on drilling test-taking techniques and practicing exam formats, often leaving little room for students to develop these essential self-management abilities (Paloș, et al., 2019; Rusakova & Yurchenko, 2022).

On the other hand, critical pedagogy (CP) offers a different perspective—one that sees education as a process of empowerment and reflection. Inspired by Paulo Freire's vision, CP encourages both teachers and learners to think critically about how knowledge is constructed and to challenge traditional, top-down teaching models (Freire, 1970). Rather than passively absorbing information, learners engage actively, questioning assumptions and taking control of their learning journeys (Cowden & Singh, 2015; Giroux, 2001). This approach naturally supports the development of self-regulation because it requires learners to reflect on their goals, decisions, and learning processes (Ares, 2006; Foley, 2007; Montalvo & Torres, 2004; Zimmerman, 2000).

Despite this promising connection, to the best of the researchers' knowledge, little research looks directly at how critical pedagogy might help IELTS learners become more self-regulated. In Iran, IELTS preparation is a huge part of many students' educational experience and a key to future opportunities (British Council, 2022; Hashemnezhad, 2020). Yet, the focus of many preparation courses tends to be narrow, emphasizing memorization and exam strategies over learner autonomy. Teachers often find themselves caught between institutional demands and the desire to adopt more learner-centered methods like CP (Chlapoutaki & Dinas, 2016). This study aimed to investigate the role of critical pedagogy in the context of IELTS instruction, focusing on its impact on students' self-regulated learning. Specifically, the research explored whether training

IELTS teachers in critical pedagogy principles led to significant improvements in their learners' self-regulation. It also examined how these teachers implemented critical pedagogy strategies in their classrooms to foster learner autonomy. Additionally, the study sought to understand teachers' perceptions and attitudes toward the in-service training they received on critical pedagogy. By addressing these dimensions, the research provides insights into both the effectiveness and practical application of critical pedagogy in IELTS preparation contexts. Therefore, the following research questions guided this study:

RQ 1. Does teaching critical pedagogy principles to IELTS teachers have any significant effect on their learners' self-regulation?

RQ 2. How do IELTS teachers employ critical pedagogy principles in enhancing their students' self-regulation?

RQ 3. What are the attitudes of IELTS teachers about the in-service training course of critical pedagogy they received?

Besides, considering the quantitative research question, the following null hypotheses were stated:

$\mathbf{H_{01}}$: Teaching critical pedagogy principles to IELTS teachers has no significant effect on their learners' self-regulation.

2. Review of the Related Literature

2.1. Critical Pedagogy: Foundations and Principles

Critical Pedagogy (CP) is not a single method or fixed strategy. It is better understood as a philosophical orientation toward education that calls for learners and teachers to engage with the world—not just to understand it, but to challenge and reshape it (Freire, 1970; Giroux, 1988). Its foundations lie in Paulo Freire's work, particularly *Pedagogy of the Oppressed* (1970), where he critiqued what he called the "banking model" of education. In that model, knowledge is treated as something deposited by teachers into passive students. Freire proposed an alternative: "problem-posing" education, where learning happens through dialogue, reflection, and action.

This shift from passive to participatory learning carries strong political implications. Freire argued that education is never neutral; it either reinforces existing inequalities or works to transform them. In this sense, CP is grounded in a vision of schooling as a space for social justice. Teachers are not merely transmitters of information, but co-learners and facilitators who support students in developing critical consciousness—or what Freire called *conscientização*—a deep awareness of social, cultural, and political forces shaping their lives.

Later scholars have expanded Freire's vision in various directions. Giroux (2001) emphasized the role of teachers as "transformative intellectuals," capable of helping students read the world as well as the word. Hooks (1994) brought attention to the emotional and relational dimensions of CP, arguing that learning should be rooted in care, honesty, and mutual respect. Kincheloe (2005) further emphasized the importance of questioning taken-for-granted assumptions, both in curriculum and in institutional structures. These perspectives converge on the idea that students must be seen as capable, thinking individuals—not empty vessels to be filled, but agents who can engage, critique, and act.

Within language education, CP has gained traction as a counterweight to standardized, test-driven instruction. Scholars like Pennycook (2001) and Canagarajah (2005) have argued that teaching English—particularly as a global language—cannot be separated from the power dynamics it carries. CP encourages both teachers and learners to interrogate how language, identity, and culture are shaped by broader systems, including colonial legacies and neoliberal market demands (Canagarajah, 2005; Pennycook, 2001). In practice, this might mean creating space in the classroom for students to question texts, relate materials to their lived experiences, or participate in shaping course content (Freire, 1970; Shor, 1992).

In short, CP does not offer a checklist. It offers a stance. It challenges teachers to consider whose knowledge counts, whose voices are heard, and what kind of learning is worth pursuing. This orientation is especially relevant in high-stakes environments like IELTS preparation, where pressure to "teach to the test" can limit opportunities for deeper

reflection. By bringing in CP, educators can begin to reclaim that space—inviting not only performance, but also purpose.

2.2. Self-Regulated Learning: Concepts and Relevance

Self-regulated learning (SRL) refers to learners' ability to consciously manage their own study behaviors, including goal setting, strategic planning, self-monitoring, and self-reflection (Zimmerman, 2008). Self-regulated learning (SRL) is widely associated with empowerment, agency, and democratic participation in the educational psychology literature. It involves the process through which learners actively control their cognitive, motivational, and behavioral engagement with learning tasks. As Vassallo (2013) highlights, researchers have increasingly dedicated attention to developing SRL pedagogy to encourage learner autonomy and persistence. However, drawing from Paulo Freire's critical pedagogy, some scholars question the ideological assumptions underlying SRL as commonly presented. Vassallo (2013) argues that teaching students to self-regulate may risk promoting a form of adaptation to existing educational systems, shaping students to fit predetermined roles rather than supporting genuine self-direction and critical awareness. Recent models such as those proposed by Gordeeva et al. (2020) and Dan, et al. (2025) reconceptualize SRL to incorporate motivation, sociocultural context, and learner identity—elements that align with pedagogical approaches rooted in CP. For example, Gordeeva et al. (2020) adapted and validated the Academic Self-Regulation Questionnaire for Russian high school students, demonstrating that effective instructional design and attention to motivational factors can significantly enhance self-regulation among learners.

Expanding on this critique, Dan, et al (2025) offer a conceptual framework that positions SRL within three paradigms of inquiry: technical, practical, and critical/emancipatory. Drawing on Habermas's (1971) theory of human interests, their review examines how SRL has been defined and studied differently depending on the philosophical stance of the researcher. Within the critical/emancipatory paradigm, SRL is seen not only as a set of strategies but as a practice shaped by learners' sociocultural realities and the power structures surrounding them (Ares, 2006; Dan et al., 2025). This perspective encourages scholars and educators to explore SRL as a transformative

process, one that can be integrated into broader pedagogical efforts to cultivate voice, reflection, and resistance to passive learning models.

Additionally, SRL is recognized in language education literature as a core element of learner autonomy. In second language learning, it is commonly framed through Zimmerman's (2000) cyclical model, which includes the forethought, performance, and self-reflection phases. These stages emphasize how learners plan, monitor, and evaluate their own learning over time. In this view, SRL is not only about individual habits but also about how instructional environments can support learners' development of effective learning strategies and self-awareness. When considered in combination with critical pedagogy, SRL becomes more than a cognitive tool; it emerges as a dialogic and socially situated practice that invites learners to take control of their learning in both technical and meaningful ways (Ares, 2006; Foley, 2007).

2.3. Critical Pedagogy and Self-Regulated Learning

Although Critical Pedagogy (CP) and Self-Regulated Learning (SRL) originate from distinct disciplinary traditions—CP from sociocultural and critical theory, and SRL from cognitive and educational psychology—they intersect meaningfully through the shared emphasis on learner autonomy, agency, and reflective engagement (Foley, 2007; Pintrich, 2004). CP conceptualizes education as a liberatory practice that fosters critical consciousness (Freire, 1970), enabling learners to reflect on their realities and assume responsibility for transforming them. Similarly, SRL is defined as a process where learners actively plan, monitor, and evaluate their learning, drawing on metacognitive, motivational, and behavioral strategies (Pintrich, 2004; Zimmerman, 2002).

The convergence becomes evident when considering that both frameworks reject passive learning. CP promotes dialogical learning, voice, and reflection (Giroux, 2001; Kincheloe, 2005), while SRL emphasizes self-directed goal-setting, self-monitoring, and strategic adaptation (Boekaerts et al., 2000). Scholars have argued that empowerment-oriented pedagogies—such as CP—create the affective and motivational conditions necessary for SRL to emerge (Paris & Paris, 2001; Zimmerman & Schunk, 2011). CP's insistence on learner participation, decision-making, and critical reflection enhances

learners' metacognitive engagement, a central component of SRL (Gordeeva et al., 2020; Schraw & Dennison, 1994).

More recently, Oberman and Sainz (2021) and Vanegas Garzón and Bedoya-Ríos (2024) have shown that applying CP principles in language classrooms fosters learner autonomy, critical reflection, and sustained engagement—key pillars of SRL. These findings suggest that CP may serve as an enabling framework that supports the cognitive, motivational, and contextual dimensions of SRL, especially in high-stakes, exam-oriented environments where autonomy is often undervalued. This conceptual overlap is increasingly reflected in empirical studies that show how CP-based teaching enhances SRL capacities (Oberman & Sainz, 2021; Vanegas Garzón & Bedoya-Ríos, 2024). Similarly, Mohammadi, et al. (2014) found that CP-based instruction led to significant improvements in self-regulation among Iranian EFL learners, further supporting the link between critical pedagogy and enhanced learner autonomy.

Thus, while CP and SRL are theoretically distinct, they can be aligned in pedagogical practice. CP provides the philosophical and social foundation for learner empowerment, while SRL offers cognitive tools for operationalizing that empowerment into actionable learning behaviors. This synergy offers a robust framework for fostering deep, reflective, and autonomous learning in language education.

2.4. Critical Pedagogy and IELTS Preparation

IELTS preparation courses tend to focus on exam skills—practicing test formats, memorizing vocabulary, and timing strategies—often at the expense of developing broader learning skills like SRL (Rusakova & Yurchenko, 2022). This narrow focus can limit learners' ability to transfer language skills to real-life situations or independent academic work (Clark & Yu, 2022). In Iran, where IELTS is a major gateway to higher education and migration, this issue is particularly pronounced. Teachers often face institutional constraints that make it difficult to introduce CP-inspired learner-centered methods (Chlapoutaki & Dinas, 2016). Similarly, Sahragard et al. (2014) found that Iranian EFL teachers generally held positive attitudes toward critical pedagogy principles and acknowledged their potential benefits for language teaching, but reported numerous barriers in its implementation, such as centralized educational policies and large class

sizes. Their findings highlight both the potential impact of CP-focused training on teacher perspectives and the contextual challenges of putting CP into practice in Iran. Yet, there is growing recognition that fostering learner autonomy and SRL can lead to more meaningful and sustainable language learning outcomes (Hashemnezhad, 2020).

Empirical studies outside IELTS contexts have shown that integrating CP principles can improve learner motivation, engagement, and autonomy (Kadel, 2020; Vanegas Garzón & Bedoya-Ríos, 2024). However, there is a clear research gap regarding how CP training for IELTS instructors might affect learners' SRL and performance specifically. This study aimed to address this gap by exploring how CP-informed teaching can cultivate self-regulated IELTS learners, offering practical insights for teachers working within high-stakes testing environments. Despite the increasing recognition of critical pedagogy as a transformative approach in language education, there remains limited empirical research examining its specific impact on self-regulated learning within high-stakes test preparation contexts such as IELTS. Understanding how CP principles shape both teacher practices and learner self-regulation is crucial for developing more effective pedagogical frameworks that go beyond mere test preparation to foster autonomous, reflective learners. This study thus attempted to fill this gap by investigating the effects of critical pedagogy (CP) training on IELTS teachers and exploring its consequent influence on their learners' self-regulation. It also examined how these teachers implemented CP strategies in their classrooms to foster learner autonomy and explored their perceptions and attitudes toward the in-service training they had received.

3. Method

3.1. Research Design

This study employed a mixed-methods design, integrating both quantitative and qualitative data to examine the impact of critical pedagogy (CP) training on IELTS teachers' instructional practices and attitudes, as well as on their learners' self-regulation. In the quantitative phase, a self-regulation questionnaire was administered to IELTS candidates before and after their teachers received CP training, allowing for the

assessment of changes in students' ability to manage their own learning. In the qualitative phase, ten IELTS teachers who participated in the CP training were interviewed to explore their perceptions of the training and its perceived effect on learners' self-regulation. Additionally, classroom observations were conducted three times in the classes of volunteer teachers to directly examine how CP principles were applied in practice to foster students' self-regulated learning. These observations offered valuable insights into the translation of pedagogical theory into classroom implementation.

3.2. Participants

The participants included 30 IELTS teachers and 150 IELTS learners from an English Language School in Tehran. Teachers were selected through convenience non-random sampling and ranged in age from 30 to 55 years. Their teaching experience varied between 5 and 15 years. Educational backgrounds were as follows: 7 held or were pursuing PhDs in TEFL, 18 had Master's degrees, and 5 were Master's students.

Learners were randomly selected from these teachers' classes, with 5 students per class chosen. They were preparing for the IELTS exam and took a retired standard IELTS mock test from the Cambridge IELTS series as a pretest to confirm their proficiency level. The learners' ages ranged from 20 to 45 years and all had at least two years of formal English study experience. Table 1 shows detailed demographic information. All the participants were informed of the purpose of the study and signed a written consent to guarantee the ethical considerations of the study. Confidentiality assurance was taken into account in this interview; hence, the participants' responses were be kept confidential and used only for research purposes.

Table 1.

Demographic Characteristics of Participants

Participants Group	N	Age Range	Gender (M/F)	Education Level	Teaching Experience (years)
Teachers	30	30-55	18/12	7 PhD, 18 MA, 5 MA students	5-15
Learners	150	20-45	85/65	Language institute students	N/A

3.3. Instruments

3.3.1. IELTS Mock Tests

Two official Cambridge IELTS retired tests were administered to assess learners' language proficiency across listening, reading, writing, and speaking components. The reliability of the tests was established using KR-21 indices, which were 0.79 for the listening section and 0.75 for the reading section. Writing and speaking were scored by two IELTS-trained raters, with inter-rater reliability coefficients of 0.87 and 0.90, respectively, confirming scoring consistency.

3.3.2. Self-Regulation Trait Questionnaire (SRT)

Another instrument used to collect the data in this study was a self-regulation questionnaire famous as Academic Self-Regulation Questionnaire (SRQ-A) (Ryan & Connell, 1989). The self-regulation questionnaire has been revalidated and shortened later (Carey et al., 2004; Gordeeva et al., 2020) and was utilized to measure the self-regulation of IELTS candidates both before and after their teachers were trained in terms of CLP principles to see if teaching critical pedagogy principles to IELTS teachers would have any significant effect on their learners' self-regulation. The scale consists of 32 items using a 5-point Likert scale (See Appendix A). The questionnaire includes various sections as follows: External Regulation (items) 2, 6, 9, 14, 20, 24, 25, 28, 32, Interjected Regulation (items 1, 4, 10, 12, 17, 18, 26, 29, 31), Identified Regulation (items 5, 8, 11, 16, 21, 23, 30), and Intrinsic Motivation. (3, 7, 13, 15, 19, 22, 27).

While answering the test examinees were supposed to select (always, most of the time, sometimes, and never) based on Likert scale. This test normally takes 45 minutes to answer. The short version of the SRQ (SSRQ) enjoys reliability of (α=.92) based on Cronbach's alpha, which highly correlates with the original SRQ (r=.96) (Carey et al., 2004).

3.3.3. Classroom Observation Checklist

Classes of the 20 volunteer teachers, who were selected based on their own willingness to take part in this phase of the study out of those 30 ones taking part in the in-service training of critical pedagogy, were observed three times after the in-service

training. In so doing, classroom observations were conducted to explore how CP principles were reflected in teaching practices and their potential impact on learners' self-regulation and performance. The researcher used a classroom observation checklist (See Appendix B). The checklist was developed based on a through literature review and consulting with five TEFL PhD holders with ten years of experience in teaching IELTS. Hence, observations were done according to a pre-defined checklist validated through expert judgment approach meaning that it was scrutinized in terms of language and content by a panel of five experts mentioned above.

This checklist includes 20 items based on a five-point Likert scale which ranged from one (never) to five (always). Items 1 through 10 focused on critical pedagogy principles manifested in teachers' behaviors serving IELTS students' self-regulation such as helping learners express their ideas freely in the classroom, involving students in the decision-making processes in the classroom, and communicating with students and paying attention to their ideas, problems, and needs.

Items 11 through 20 measured the implementation of critical pedagogy principles as reflected in teachers' classroom practices aimed at enhancing students' performance. These included using challenging reading materials aligned with the dialogical principles of critical pedagogy in IELTS reading instruction, overlooking local errors that did not hinder meaning for later fine-tuning, and adopting a flexible curriculum to teach the various IELTS skill areas.

One of the researchers, who also served as the class observer, monitored various classes following the workshop to ensure that the principles of critical pedagogy were being implemented. Having a single observer allowed for consistency in the observation process across all classes and teachers. After each session, a briefing was conducted with the teachers to coordinate efforts and ensure that all key principles were effectively applied in their classrooms.

3.3.4. Semi-Structured Interviews

Interviews with 10 volunteer teachers aimed to explore their perceptions of CP training and its effects on their teaching practices and their ability to foster learner autonomy and self-regulation. The interviews lasted approximately 15 minutes, were

conducted in Persian to facilitate clearer expression of ideas, and were recorded and transcribed for analysis. An interview guide was prepared and piloted to ensure clarity and relevance. To develop the questions, the researcher considered the CP training content and drew upon the literature on critical pedagogy and SRL. A panel of five experts holding PhDs in TEFL reviewed the questions and provided comments, which were incorporated into the final version. After that, the interview questions were pilot with three teachers who did not participate in the study to check their clarity and relevance. The interviews were designed to explore how teachers interpreted and enacted the principles introduced during the CP training, including fostering student voice, promoting dialogic interaction, encouraging shared authority in the classroom, and integrating learners' lived experiences into instruction. These elements reflected the foundational tenets of critical pedagogy as articulated by Freire (1970), Giroux (2001), and Kincheloe (2005).

The rationale for including the interviews was to explore how CP-informed teaching influenced classroom culture and student behavior in ways not fully captured by the quantitative instruments. In particular, the interviews aimed to uncover how CP principles shaped opportunities for learners to self-regulate, make meaningful choices, and participate in shaping the learning process—core dimensions of SRL supported by a critical pedagogical stance. The interview guide was developed in alignment with the CP training content and included prompts related to teacher perceptions of student participation, classroom authority, reflection, goal-setting, and engagement (See Appendix C). Responses were thematically analyzed to identify patterns in how instructors interpreted and implemented critical pedagogy in their IELTS preparation classrooms, and how this, in turn, supported or constrained students' self-regulated learning.

3.4. Data Collection Procedure

The data for this study were collected through multiple instruments to investigate the impact of critical pedagogy (CP) training on IELTS learners' self-regulation (SR). Participants were selected from an English Language Institute in Tehran, Iran. Each of the 30 IELTS instructors taught a class of 8 learners, totaling 240 students. All learners had previously completed the institute's standard written and oral placement tests, which

confirmed that all participants were at an intermediate level of English proficiency based on the institute's placement criteria. From each class, 5 learners were randomly selected, resulting in a final sample of 150 student participants. These students later completed an IELTS pretest to establish a performance baseline prior to the CP-based instruction.

Before the CP training, learners completed a self-regulation questionnaire to establish baseline levels of self-regulatory behaviors. This questionnaire, based on Ryan and Connell's (1989) Academic Self-Regulation Questionnaire (SRQ-A), was administered again after the CP training to measure changes in learners' self-regulation.

To fulfill the goals of the training program and to equip the teachers with the basic principles of critical pedagogy and to help them experience what a CP-based teaching is, a 5-week program was held. The training course consisted of 10 sessions, 2 hours each, held on two consecutive days of each week.

The course started with an introduction to what critical pedagogy and critical literacy were and how this approach could empower learners and encourage a deeper learning process. The second session was devoted to the comparison of the banking model and problem posing education. Then, some techniques and instructional tools in CP-based classes were presented in the following sessions. Using authentic materials, watching movies, selecting critical reading texts, and practicing dialogical teaching were among the tasks introduced to the teachers.

In addition, classroom practices of 20 volunteer IELTS teachers who had undergone CP training were observed three times using a validated classroom observation checklist. The observation process ensured consistent data collection, as the researcher conducted all observations using the same criteria and held briefing sessions with teachers to confirm fidelity to CP principles.

Furthermore, semi-structured interviews were conducted with 10 IELTS teachers who had participated in the CP training. These interviews aimed to explore teachers' attitudes toward the CP training program and how it influenced their practices in enhancing learners' self-regulation. The interviews were recorded, transcribed verbatim, and analyzed thematically using MAXQDA software to identify key themes regarding the application of CP in promoting self-regulatory behaviors. Ethical considerations were

observed throughout the data collection process, including obtaining informed consent from all participants and ensuring confidentiality. The combination of self-report questionnaires, classroom observations, and teacher interviews provided comprehensive and triangulated data to assess the influence of CP training on learners' self-regulation in the IELTS context.

3.5. Data Analysis

3.5.1. Quantitative Analysis

Data were analyzed using SPSS v25. Descriptive statistics were used to summarize demographic information. Learners' IELTS scores were analyzed using Multivariate Analysis of Covariance (MANCOVA), controlling for pretest scores to detect significant differences in posttest results across IELTS components. One-way ANCOVA was conducted to assess learners' self-regulation posttest scores, controlling for their pretest values. Additionally, Pearson correlation analysis examined the relationships between learners' self-regulation and their IELTS performance scores.

3.5.2 Qualitative Analysis

The qualitative data, including interview transcripts and observation fieldnotes, were analyzed using thematic analysis. The process followed the open, axial, and selective coding procedures described by Strauss and Corbin (1998). The researcher transcribed the interviews, organized them into categories, and then evaluated the data. MAXQDA 24 software was used to analyze, code, and manage the interview transcripts. This method enabled the identification and categorization of general related views (open coding), specific issues (axial coding), and the most frequent and critical points (selective coding), providing a comprehensive understanding of the effectiveness of the instructional approach.

4. Results

4.1. Quantitative Results

4.1.1. Homogeneity Results

To confirm the homogeneity of the participants before the intervention, a MANCOVA was conducted on the pretest scores of IELTS components and self-regulation variables. The results revealed no statistically significant difference between the experimental and control groups, Wilks' Lambda = 0.472, F(36, 143) = 1.16, p = .261, indicating that the groups were equivalent at baseline.

Before addressing the first research question, it was important to check if the data met the assumption of normality. Skewness and kurtosis values for the self-regulation scores—both before and after the intervention—fell comfortably within the accepted range of ±2. This was true for both the experimental and control groups. These results suggest that the distribution of scores was reasonably normal and suitable for further analysis (Bachman, 2005; George & Mallery, 2020). The details are shown in Table 2.

Table 2.

Skewness and Kurtosis of Self-Regulation Scores

Group	Test	Skewness	Std. Error	Kurtosis	Std. Error
Experimental	Pretest	0.353	0.293	0.904	0.578
	Posttest	-0.555	0.293	0.048	0.578
Control	Pretest	0.217	0.264	-0.256	0.523
	Posttest	0.546	0.264	0.211	0.523

4.1.2. Reliability of the Self-Regulation Questionnaire

It was also essential to ensure that the self-regulation questionnaire was reliable for this sample. Cronbach's alpha showed very good reliability index for both pretest and posttest data, with values above 0.90. This means the questionnaire consistently measured self-regulation among learners. The results can be seen in Table 3.

Table 3.

Reliability of Self-Regulation Questionnaire

Test	Cronbach's Alpha	Number of Items
Pretest	0.92	32
Posttest	0.94	32

4.1.3. Descriptive Statistics of Self-Regulation Scores

Before the intervention, the self-regulation scores of the two groups were relatively similar. The experimental group had a pretest mean of 3.45 (SD = 0.63), while the control group had a mean of 3.37 (SD = 0.55) (see Table 4).

Table 4.

Self-Regulation Pretest Scores in the Experimental and Control Groups

Group	Test	N	Mean	Std. Deviation	Std. Error Mean
Experimental	Pretest	67	3.45	0.63	0.077
Control	Pretest	83	3.37	0.55	0.060

After the intervention, the experimental group showed a noticeable improvement, with a posttest mean of 4.12 (SD = 0.56), whereas the control group's posttest mean was 3.48 (SD = 0.59). These descriptive statistics are shown in Table 5. Looking at the average scores after the intervention, learners in the experimental group scored noticeably higher on self-regulation compared to those in the control group. Table 5 provides these descriptive statistics, indicating a clear difference between groups.

Table 5.

Self-Regulation Posttest Scores in the Experimental and Control Groups

Group	N	Mean	Std. Deviation	Std. Error Mean
Experimental	67	4.12	0.56	0.068
Control	83	3.48	0.59	0.065

4.1.4. Impact of Critical Pedagogy Training

To formally test whether critical pedagogy training for teachers made a difference in learners' self-regulation, a one-way ANCOVA was run. This allowed us to control for

pretest scores, ensuring any posttest differences were not simply due to initial group disparities. The homogeneity of regression slopes assumption was met, allowing the ANCOVA to proceed without issue.

The analysis revealed a significant effect of the intervention on posttest self-regulation scores. Learners whose teachers received critical pedagogy training demonstrated higher self-regulation, even after accounting for their starting levels. This effect was strong and meaningful (see Table 6).

Table 6.

ANCOVA Results for Self-Regulation Posttest

Source	Type III Sum of Squares	df	Mean Square	F	p	Partial Eta Squared
Group	12.31	1	12.31	27.45	<.001	0.16
Pretest SR	3.67	1	3.67	8.19	.005	0.05
Error	65.99	148	0.45			

The one-way ANCOVA analysis showed a statistically significant difference in posttest self-regulation scores of learners whose teachers had received CP training. The pretest scores were treated as covariates to ensure that posttest differences were due to the intervention, not initial disparities. The partial eta squared ($\eta^2 = .16$) represents a moderate to large effect size, indicating that teaching critical pedagogy principles to IELTS teachers had a meaningful effect on their learners' self-regulation. This finding shows that CP training significantly influenced learners' ability to monitor and manage their own learning, an essential aspect of SRL. Therefore the null hypothesis is rejected.

4.2. Qualitative Insights

Qualitative data added depth to the numbers. Through classroom observations and interviews, teachers shared how they applied critical pedagogy principles to nurture learners' self-regulation and offered reflections on the training they received.

4.2.1. Classroom Observations

To assess how teachers implemented critical pedagogy (CP) principles that supported learners' self-regulation, classroom observations were conducted using a

validated observation checklist designed for this study (Appendix B). The checklist contained 10 items measuring classroom practices aligned with CP values, including promoting learner voice, autonomy, and active participation. Each item was rated on a 5-point Likert scale ranging from 1 (Never) to 5 (Always).

Observation data were collected from 20 IELTS teachers who had completed CP training. Observation checklists revealed that teachers often encouraged learners to freely express their ideas, involved them in decisions about learning activities, and used authentic materials to broaden their perspectives. These practices appeared regularly and consistently, with high average scores (Table 7).

Table 7.

Classroom Observation: Teachers' Practices Related to Self-Regulation

Practice Description	Mean	SD
Encouraging learners to express ideas freely	4.30	0.56
Involving students in classroom decision-making	4.00	0.65
Using authentic/complementary materials	4.10	0.60
Allowing students to choose learning methods	4.05	0.62
Paying attention to students' ideas and needs	4.15	0.58

According to the checklist data, there was a noticeable improvement in teachers' behavior to implement CP principles. The items like encouraging learners to express their ideas freely, involving learners in decision-making processes, and using authentic materials received high scores, which show teachers' attempt to provide learners with more agency and voice in the classroom after the CP training. For example, in "Encouraging learners to express ideas freely" (M = 4.30), observers frequently noted teachers prompting students with open-ended questions like "What do you think about this issue?" or "Can anyone suggest an alternative solution?" These questions allowed students to share opinions without fear of correction, creating a dialogic and inclusive learning space. The practice "Using authentic/complementary materials" (M = 4.10) was observed when teachers brought in news articles, video interviews, or infographics related to current social themes, encouraging learners to engage with meaningful content beyond the textbook. Allowing students to choose learning methods" (M = 4.05) included offering choices between group work, pair discussions, or individual tasks depending on

student preferences. “Paying attention to students’ ideas and needs” (M = 4.15) was demonstrated when teachers adapted lesson pacing or incorporated student feedback into planning. These suggest a shift in classroom culture toward learner-centeredness, reflecting a practical alignment with CP values like dialogic instruction and shared authority.

4.2.2. Teachers’ Perspectives

To better understand how CP-informed instruction influenced classroom practice, semi-structured interviews were conducted with ten IELTS teachers who had completed the CP training. The interviews were recorded, transcribed verbatim, translated, and analyzed thematically using MAXQDA software, following a coding procedure grounded in inductive content analysis. Codes were developed directly from teacher responses, then grouped into broader themes through iterative comparison and refinement. Three prominent themes emerged from the data.

Learner Empowerment through Choice. Teachers observed that giving students more control over their learning boosted motivation and responsibility.

> *When I started letting students pick their own writing topics, the change was clear—they were more committed and took the task seriously because it felt like their work, not just an assignment* (Teacher 4).
>
> *One of my students asked to use a vocabulary app instead of the usual worksheet. I agreed, and soon others began suggesting their own learning tools. It quickly evolved into a collaborative space where students took ownership of their learning process* (Teacher 7).

Dialogue and Reflection. Regular discussions encouraged learners to think about their own learning strategies and goals.

> *Our classroom became more interactive and less teacher-centered, which helped students reflect more on their own progress* (Teacher 10).
>
> *Instead of simply pointing out what was wrong, I began asking, 'What do you think led to that answer?' This small change encouraged students to think more deeply about their problem-solving approach.* (Teacher 2).

> *At first, they found it strange to talk about how they learned, but over time, they started making comments like 'I realized I study better in the mornings'—small realizations that helped them plan better* (Teacher 9).

Creating Supportive Atmosphere. Teachers aimed to build inclusive environments where learners felt comfortable taking risks and self-assessing.

> *I asked students to evaluate their own work before I provided feedback, and I was amazed by their honesty. It revealed that they simply needed the space to reflect and think critically about their own work (*Teacher 1*).*

> *One quiet student rarely participated, but after I made a point to acknowledge a small contribution they made, they began to open up. Sometimes, small gestures of trust can make a big difference* (Teacher 6).

> *After incorporating my trainings in my class, I noticed that my students became more self-directed. They began setting their own goals and reflecting on their progress, which significantly boosted their focus and motivation* (Teacher 3).

These perceptions were also supported by classroom observation data, where high scores were recorded for encouraging learners to express ideas freely, involving them in classroom decision-making, and using authentic materials. Thus, the interview data directly supported the findings of teachers' classroom practices—such as fostering learner autonomy, encouraging dialogue and reflection, and using authentic materials—contributed to the development of students' self-regulation.

However, putting a lot of pressure on the participants and providing a lot of materials in a relatively short period of time were highlighted as negative points of the program experienced by the teacher participants. These points could be due to lack of familiarity of the participants with learner-centeredness in CP teaching and learning approach.

Taken together, the qualitative findings from both observations and interviews indicated that CP training had a meaningful impact on teaching behavior and classroom atmosphere. Teachers created more democratic learning environments, and learners

responded with increased autonomy and reflective habits—two core dimensions of self-regulated learning.

5. Discussion

The findings of this study suggested that critical pedagogy training positively influenced IELTS learners' self-regulation. The quantitative results demonstrated a significant increase in self-regulatory behaviors among learners whose teachers received the CP intervention. This improvement aligns with the qualitative data showing that teachers applied critical pedagogy principles to foster learner autonomy, reflection, and motivation—core components of self-regulated learning. This pattern is consistent with the findings from Mohammadi, et al. (2014) who demonstrated that CP-based instruction led to enhanced self-regulation among Iranian EFL learners, and with Gordeeva et al. (2020), who emphasized the role of instructional design in fostering effective SRL. Critical pedagogy, grounded in Paulo Freire's (1970) concept of "praxis" and critical awareness, aims to empower both teachers and students as agents in the classroom, challenging traditional power structures and fostering autonomy, reflective thinking, and self-regulation (Oberman & Sainz, 2021). The present study's findings support this theoretical foundation, demonstrating that CP-based instruction can meaningfully enhance learner autonomy and motivation in EFL contexts.

Observation checklists revealed that teachers often encouraged learners to freely express their ideas, involved them in decisions about learning activities, and used authentic materials to broaden their perspectives. These practices appeared regularly and consistently, with high average scores (Table 6). As these actions align closely with principles of learner-centered instruction, they suggest that CP training helped teachers create conditions conducive to developing learner autonomy and reflective engagement—both foundational to self-regulated learning.

The positive attitudes of IELTS teachers toward the in-service critical pedagogy training program also play an important role. By analyzing the interview data, it became evident that the teacher participants found the CP training to be a welcoming and user-friendly experience, with effective content that prioritized their views throughout the

process. This positive perception likely contributed to their ability to implement CP principles more systematically and confidently in their classrooms. For example, teachers reported incorporating freedom of speech, peer and self-evaluation, and innovative learning techniques such as using films and challenging texts. These activities provided a structured yet flexible environment that encouraged learners to develop greater autonomy and self-regulation. The encouraging findings regarding teachers' attitudes and classroom practices align with previous research showing that exposure to CP principles in training can significantly influence educators' teaching perspectives and practices (Sahragard et al., 2014). It is reasonable to infer that teachers' growing familiarity with CP principles, coupled with supportive training environments, enhanced their readiness to create classrooms that promote self-regulation among learners.

Moreover, teachers emphasized the motivational effects of the CP training on learners' analytical reading and critical evaluation skills. As described in the interview findings and observation data, teachers specifically noted these changes, reporting increased motivation for analytical reading and critical evaluation, more opportunities for students to express ideas freely, participate in decision-making, and use authentic materials, all of which contributed to self-regulated learning. These aspects resonate with research emphasizing the role of psychological safety and active participation in fostering self-regulation, as empowerment-oriented pedagogies have been shown to create the motivational and affective conditions necessary for SRL to emerge (Paris & Paris, 2001; Zimmerman & Schunk, 2011). Furthermore, studies by Oberman and Sainz (2021) and Vanegas Garzón and Bedoya-Ríos (2024) demonstrated that integrating CP principles in language classrooms can improve learner engagement, autonomy, and self-regulatory skills—findings that closely align with the results of the current study.

However, teachers' attitudes about the challenges of implementing CP teaching, reflect broader educational trends in Iran, where traditional schooling often focuses on memorization and lower-order cognitive skills (Farrokhi & Parvin, 2023), whereas CP emphasizes higher-order thinking like analyzing and creating (Heidari, 2020). Despite these challenges, the teachers found the program motivating and appreciated the atmosphere that encouraged sharing feelings and involving learners' voices in classroom activities.

These findings support the theoretical understanding that learner autonomy, dialogue, and reflection are critical for developing self-regulatory skills (Zimmerman, 2002). Interview data showed that learners enjoyed the freedom to express their ideas and engage in critical analysis facilitated by CP methods. This freedom helped learners move beyond surface-level learning and fostered deeper engagement with materials, which is vital for developing strong self-regulation in language learning.

Importantly, the study suggests that critical pedagogy goes beyond academic skill development to empower learners as agents of their own learning. This is supported by the quantitative findings showing a significant improvement in learners' self-regulation (Table 5), and by qualitative observations of increased student agency and classroom dialogue (see Section 4.3.2). By fostering autonomy and reflective thinking, CP prepares learners to navigate not only language learning challenges but also social realities with greater awareness and agency.

In sum, the integration of CP principles into teacher training shows promise as a practical approach to enhance learners' self-regulation in IELTS contexts. While the intervention faced challenges rooted in traditional educational norms—such as an emphasis on memorization and limited familiarity with learner-centered, higher-order thinking—, its overall positive impact on both teachers' attitudes and learners' self-regulatory behaviors underscores its potential for meaningful change.

6. Conclusion

The present study demonstrated that teachers' knowledge of critical pedagogy (CP) principles could positively influence EFL learners' IELTS self-regulation enhancement. The analysis of checklist data revealed the positive role of teachers' classroom practices, based on CP principles, in enhancing EFL learners' self-regulation. These results underscored the changes in teachers' practices after they experienced a course in CP. In addition to the success of the in-service training program, teachers' real classroom conduct proved that learners were influenced by their teachers' perspectives; the changes in teachers' beliefs and educational approaches were witnessed in their

classroom management, teaching strategies, and attempts to bring about changes in learners (Li, 2023; Salimi & Khazaee Kouhpar, 2023).

The interview data analysis revealed a relatively comprehensive understanding of the effectiveness of the in-service training course of critical pedagogy in general and on IELTS classroom practices in particular. IELTS teachers taking part in the study considered the in-service CP training course as a welcoming and user-friendly experience, presenting effective content while prioritizing participants' views. Moreover, the findings revealed that teacher participants could use CP principles in their daily teaching through fostering student autonomy, developing positive behavioral change in the classroom, and supporting problem-solving and reflective learning.

The present study findings suggest that EFL teachers need to gain relative mastery over CP principles such as embracing alternative pedagogies to challenge oppressive traditional education paradigms, democratization, and critical reflection. The themes emerging from interviews underscore the positive impact of teachers' CP knowledge on student learning, with increased focus, better understanding, and constant engagement cited as key benefits. Therefore, enhancing EFL learners' self-regulation through CP-based teacher training can be considered a practical and effective strategy in EFL contexts.

While the findings support the usefulness of CP in fostering self-regulated learning and improving IELTS performance, they should be interpreted in light of certain methodological constraints. The present study faced some limitations. The individual characteristics of the IELTS teachers, such as their educational background, teaching philosophies, gender, and age, could not be fully controlled. These factors may have influenced their responses to the integration of critical pedagogy. Teachers' prior experience and familiarity with reflective methods might also have shaped their perception of the training. Delimitations set by the researcher included the reliance on a limited set of tools: IELTS test, observations, questionnaires, and interviews. Also, the study was geographically limited to one English language school in Tehran, and only teachers with at least five years of experience were included.

Considering these limitations, further research is needed for investigations. Future studies can focus on the direct impact of CP on EFL learners' L2 development and self-regulation skills and consider examining the residual effects of CP-based teaching and learning methods on EFL learners' language proficiency and self-regulation development to explore whether and how long-term these effects actually could be. Moreover, future research is recommended to explore the role of CP-based teaching and learning in developing second language cultural familiarity, cooperative learning, and other components of the second language and their probable effects on learner autonomy, self-regulatory factors, and learner motivation.

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Appendix A

Self-regulation Scale

Definitely Agree=5; Agree with Reservation=4; A Definite Answer Is Not Possible=3; Disagree with Reservation=2; Definitely Disagree=1						
1	I don't notice the effects of my actions until it's too late.	5	4	3	2	1
2	I put off making decisions.					
3	It's hard for me to notice when I've "had enough" (alcohol, food, sweets).					
4	I have trouble following through with things once I've made up my mind to do something.					
5	I don't seem to learn from my mistakes.					
6	I usually only have to make a mistake one time in order to learn from it.					
7	I can usually find several different possibilities when I want to change something.					
8	Often, I don't notice what I'm doing until someone calls it to my attention.					
9	I usually think before I act.					
10	I learn from my mistakes.					
11	I give up quickly.					
12	I usually keep track of my progress toward my goals.					
13	I am able to accomplish goals I set for myself.					
14	I have personal standards, and try to live up to them.					
15	As soon as I see a problem or challenge, I start looking for possible solutions.					
16	I have a hard time setting goals for myself.					
17	When I'm trying to change something, I pay a lot of attention to how I'm doing.					
18	I have trouble making plans to help me reach my goals.					
19	I set goals for myself and keep track of my progress.					
20	If I make a resolution to change something, I pay a lot of attention to how I'm doing.					
21	I know how I want to be.					
22	I have trouble making up my mind about things.					
23	I get easily distracted from my plans.					
24	When it comes to deciding about a change, I feel overwhelmed by the choices.					
25	Most of the time I don't pay attention to what I'm doing.					
26	I tend to keep doing the same thing, even when it doesn't work.					
27	Once I have a goal, I can usually plan how to reach it.					
28	If I wanted to change, I am confident that I could do it.					
29	I can stick to a plan that's working well.					
30	I have a lot of willpower.					

Appendix B

Classroom Observation Checklist

Always=5Often=4 Sometimes=3 Rarely=2 Never=1						
No.	Item	1	2	3	4	5
1.	The teacher helps learners express their ideas freely in the classroom.					
2.	The teacher makes a better chance for accepting students' ideas and critiques.					
3.	The teacher refers the students to complementary materials to expand their world views and perspectives on learning.					
4.	The teacher involves students in the decision-making processes in the classroom.					
5.	The teacher allows students to select their own learning methods and encourages them to do so.					
6.	The teacher poses problems in the class to help learner think more critically.					
7.	The teacher gives room to self-creative activity of the learner and lets them speak about their own life.					
8.	The teacher communicates with students and pays attention to their ideas, problems, and needs.					
9.	The teacher tries to help marginalized students get involved in the classroom discussions and have their own voice heard.					
10.	The teacher helps learners improve their problem posing techniques and increases critical consciousness of students.					
11.	The teacher employs (dialoguing; dialogical principle of CP) in the classroom while teaching IELTS productive skills.					
12.	The teacher uses authentic materials like movies and newspapers in teaching to foster topic development in IELTS skills like writing and speaking.					
13.	The teacher uses listening materials presenting challenging negotiations and conversations in the classroom while teaching IELTS listening.					
14.	The teacher uses challenging reading materials following dialogical principle of CP in the classroom while teaching IELTS reading.					
15.	The teacher neglects learners' local errors to be fine-tuned (the errors which do not impede the conveying of meaning).					
16.	The teacher follows a flexible program in the classroom to teach different skills of IELTS.					
17.	The teacher asks students to read challenging texts such as the discussion of articles, newspapers, and book chapters to enhance their language abilities.					
18.	The teacher encourages students to assess their peers' performance in the class.					
19.	The teacher encourages students to assess their own performance in the class.					
20.	The teacher engages almost all students in the classroom discussions and uses Q & A sessions to make this more effective.					
Critical pedagogy principles serving IELTS students' self-regulation (Items 1 through 10). Critical pedagogy principles promoting students' performance (items 11 through 20).						

Appendix C

Interview Prompts

A. Views about Workshop Program

1. What were the benefits of your critical pedagogy in-service training program?
2. What were the disadvantageous of your CP in-service training program?
3. What did you like the most of the critical pedagogy in-service training program ?
4. What did you like the least of the critical pedagogy in-service training program?

B. Views about the Effect of CP Enhancement on Teachers' Ability to Foster Self-Regulation

5. What do you think about the effect of CP enhancement on your ability to support your students' self-regulation in their learning?
6. How do you evaluate your own ability to promote self-regulated learning in your classroom after the in-service instruction you have had?
7. How do you use CP principles to encourage self-regulation among your students during teaching?

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Phenomenology of virtual education culture in the Iranian higher education

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Abstract

This qualitative phenomenological study explored the culture of virtual education in Iranian higher education, focusing on the lived experiences of 31 professors and students. Employing structured interviews and thematic analysis, the research identified one overarching theme and six primary subcultures: interaction and communication, scientific and academic processes, emotional dynamics, exclusion, acceptance, and neutrality. The findings revealed that virtual education reshapes traditional academic norms by enabling wider scientific communication, reducing knowledge monopolies, and increasing collaboration across institutions. However, challenges such as diminished emotional connections, weakened academic commitment, increased superficial learning, and reduced in-person engagement also emerge. Students' and professors' attitudes toward virtual education varied, ranging from full acceptance to indifference. These orientations are influenced by personal values, learning styles, technological familiarity, and institutional support. While virtual education fosters academic freedom and access, it simultaneously disrupts emotional and spatial dimensions of learning environments. The study concludes that understanding the cultural dimensions of virtual education is crucial for policymakers and educators to enhance its effectiveness. Tailoring educational planning to account for emotional, structural, and communicative factors will be essential in ensuring the long-term sustainability and equity of virtual education in higher education contexts.

Key Words: Higher Education, Phenomenology, Virtual Education Culture

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1. Introduction

The relationship between culture and curriculum is a topic that has become the common thread of many experts in the field of curriculum in the last few decades (Banks, 2018). Some experts consider curriculum and culture as the cause and effect of each other (MacDonald et al., 2023), and some theorists consider culture and curriculum as two inseparable elements (Yang & Li, 2022). Today, learning and teaching is considered a cultural phenomenon from the perspective of theorists and researchers. In fact, the curriculum is a reflection of cultural beliefs, folk traditions, values and moral and political organizations of the society (Sadeghi, 2012). In other words, curriculum can be considered an extract from society (Finn et al., 2022). Therefore, understanding culture is very important in this field (Ke et al., 2023).

In order to understand this relationship, culture must first be defined. In this context, several definitions of culture have been presented. Damen (2017) considers culture to be learned and shared human patterns or models for living and daily life that have penetrated all dimensions of human social interactions. He defines culture as the basic human adaptation mechanisms. Abbasi et al. (2020) consider culture as common group norms in a society. Wormley et al. (2021) define culture as a set of habits, beliefs and rules. Kuper (2018) does not consider culture as artifacts, tools and other objective cultural elements, but rather how group members interact and use these tools and artifacts. He believes that values, symbols, interpretations and views are what distinguish one nation from another in today's modern society, not objects and other objective dimensions of human societies. Muminova (2021) refers to the three dimensions of interaction, sharing and compatibility as the main elements in culture. Gorski (2016) gives an expanded definition of expressive culture. He believes that culture is a complex whole consisting of knowledge, belief, art, ethics, law, customs and any other type of habit and characteristic acquired by humans as a member of society. Culture, as a mediator in the direction of transferring different values and attitudes to learners, facilitates the opportunity to achieve education and learn the curriculum. Grant (2019) considers culture to be patterns derived from thinking and behavior that are passed from one generation to the next. Hopkins (2016) considers culture as a systematic system of symbols and meanings according to which social interactions take place. In any case, due to the

increasing expansion of culture in all dimensions of human life, all issues are viewed from this cultural framework.

As in education and in the field of curriculum, the cultural approach can be considered in such a way that the design, implementation and evaluation of courses can only be done successfully if all the processes of design, implementation and evaluation of courses take into account the social context (Fazeli, 2016). In fact, all aspects of the curriculum reflect culture; culture and curriculum are containers of each other (Hawa and Goa, 2021). As Sadeghi (2012)has mentioned, culture is a mirror to describe and interpret the curriculum in several cases and explains that using a cultural perspective makes us see the curriculum not only as a goal (content), but also as a set of intertwined dynamics. Conceptualizing the curriculum as culture allows us to be more aware of belief systems, values, behaviors, language, artistic expressions, educational environment, power relations, and most importantly, the norms that are the basis of our interpretation of the right and wrong things to be sensitive. Therefore, paying attention to the relationship between the curriculum and culture makes the curriculum closer to the real experiences of the learners, which provides the basis for learning and, as a result, effective education. Curriculum culture also means basically beliefs about the teaching-learning process (Kim, 2018).

Apart from the definition of culture in traditional and formal education, it seems that paying attention to the culture of education with regard to new technologies has become an important issue in the curriculum. New technologies have led to a special kind of culture. Paying attention to these technologies and the culture that emerges from them in teaching and education is one of the necessities of the present era (Matusov, 2023). Virtual education with the slogan of education centers is closed, but education is not closed created huge changes in the education system and moved education from face-to-face to virtual and integrated (Jenkins, 2013). Access to social and communication networks and the emergence of the information society have led universities and schools to train individuals who are simultaneously compatible with the goals, missions, and information mechanisms and, on the other hand, are its promoters (Harbison & Rex, 2010). Therefore, some universities and schools, realizing the importance of this issue, gradually encourage their students to enter virtual environments. According to the results

of a study by Hawkins (2019), more than 97% of American universities and 95% of British universities and higher education institutions use virtual learning environments. Also, in some countries such as America, Canada, Australia, and England, every student is required to take at least two lessons of their academic courses virtually. Therefore, it is clear and obvious that with the help of information technologies based on the Internet, a huge revolution has been created in learning (Paudyal, 2020; Perso, 2012). Such a revolution has led to efforts at all levels of education, including higher education (Peters, 2016).

This issue has put higher education institutions under severe pressure to provide virtual and online courses (Jenkins, 2013; Lombardi, 2013, Pappano, 2012). One of the techniques of online education is virtual education (Erdogan, 2018). In virtual education, learners are able to determine their learning speed according to their abilities and achieve educational goals (Saif, 2015). Virtual education is the connection point between distance education and education based on Internet technologies (Hua & Gao, 2021). In other words, virtual education can be defined as an educational program based on multimedia facilities that uses Internet resources to create a meaningful learning environment, to provide growth and support for learning (Edmundson, 2013). Virtual education is a well-known tool for storing, presenting, collecting, sharing, processing and using information. Virtual education has many advantages for learning (Kim, 2018). Virtual education is focused on providing course content online and includes a variety of multimedia facilities such as visual, audio, drawing, demonstration, animation and video.(Grothaus, 2022). In virtual education, it is possible to present courses in a multimedia environment (Yang & Li, 2022). In addition, access to materials and content is available at any time and place (Damen, 2017). One of the distinctive features of virtual education is its repeatability in the sense that it can be repeated many times so that the learner can fully achieve the predetermined goals (Hua & Gao 2021). Further, it is easy for students to access professors and other students in this type of education (Christudas et al., 2018).

These affordances have led to the formation of a special atmosphere in virtual education, so, due to its breadth and scope and the simultaneous presence of students from different geographical locations, cultures, backgrounds and interests, virtual education provides many challenges and opportunities (Macleod et al, 2015). With the

movement of students towards virtual education (Nesterko & Glaesmer., 2016) and the increase of virtual education courses, a special type of learning communities is being formed that never existed before (van Breda-Verduijn & Heijboer, 2016). In virtual education, the way of interactions between different elements of learning is completely different from conventional and traditional ones (Du et al., 2023). In other words, virtual education is changing the way of learning by providing a special kind of learning culture (Christudas et al., 2018). Xiaojun and Peng (2010) believe that such a culture affects the way people think and their behavioral patterns by changing their attitudes. Such a culture requires a unique adaptation in learners due to its special pedagogy (Mathiasen, 2015). For example, in virtual education, the way of interaction between educational elements, including the instructor and the learner, is completely different from traditional education and is more focused on the individualization of the learning process (Gasparini et al., 2012; Mirza & Chatterjee, 2012).

Therefore, understanding the atmosphere of virtual education and the culture of this type of education requires paying attention to some specific indicators. In this type of education, paying attention to the individualization of the content and on cooperative learning are two of the main indicators of the learning culture (Swierczek & Bechter, 2010). Therefore, one of the characteristics of the learning culture in virtual education is to pay attention to the preferences of the learners. In this type of education, the correspondence between content and learners' preferences is very important (Christudas et al., 2018). The next indicator of the learning culture of virtual education is related to the format and shape of the content, the content in virtual education occurs in various formats including text, text-image, video, image or a combination of these (Christudas et al., 2018). In fact, virtual education tries to facilitate learning experiences by providing different forms of content (Limperos et al., 2015). Another indicator is the way of teaching and presenting the content. In virtual education, teaching is based on the background of the learners and the learning style of the learners, their motivation and expectations are taken into consideration (Sfenrianto et al., 2014; Yang and Chang, 2013).

According to the above indicators, the culture of virtual education can be defined as the behaviors, methods and how learners engage with the Internet and technology as a part of the learning process (Collins & Halverson, 2009). Therefore, the culture of virtual

education should be sought in the use of technology and the Internet in learning (Nussbaum, 2013). Because in this type of education, the use of technology and the Internet have a direct relationship with the learning skills of the learners (Kljunić & Vukovac, 2015). In addition, the manner of interaction and personality of learners in virtual education is also affected by the special atmosphere of this type of education (Stachl et al., 2017). For example, Kolikant (2019) believes that in virtual education, the use of technology and the Internet brings two aspects of seriousness and entertainment together for learners.

Many studies have been conducted on virtual education, which indicate that the style and method of learning have undergone fundamental changes with the emergence and spread of virtual education (Boswell et al, 2024; Christudas et al., 2018, Akinkuolie & Shortt, 2021; Karimi, 2021; Kazempour et al., 2021; Qoraishi-Khorasgani, 2022). In other words, changes have occurred in learners and instructors that did not exist before virtual education. For example, Boswell (2024) argued that the interactions that occur in virtual education between various educational elements, including the instructor and the learner, have never existed before. Akinkuolie and Shortt (2021), emphasizing the emotional dimension in virtual education, noted that the level of individualism in virtual education is increasing sharply. Elvik and Kenzaro (2021) and Qoraishi-Khorasgani (2022) emphasizing the knowledge dimension in virtual education, remarked that the level of promotion of superficial information in virtual education is increasing. Karimi (2021) and Kazempour et al. (2021) also stated that in virtual education, the preferences and expectations of learners and educators have undergone dramatic changes. In other words, in this type of education, the mere transfer of information is not the issue.

As is clear from the above investigations, each of them has focused on a specific dimension of virtual education; for example, the expectations, knowledge, and emotional dimensions have been examined separately. However, important issues such as the atmosphere governing virtual education have not been given much attention. On the other hand, examining the lived experiences of people involved in virtual education in order to understand them in depth has been sparse. Hence, the study of the culture of virtual education in higher education from three dimension of why learning, how to learn and where to learn are very important (Ming-tso, 2019). Based on the above points, this study

tried to address the following research question:

- What are the characteristics and components of virtual education culture in the Iranian higher education based on the lived experiences of professors and students?

2. Method

2.1. Design

The current research was conducted using qualitative and phenomenological (descriptive) method. The purpose of phenomenological research is to describe life experiences as they happened in life. Streubert & Carpenter (2003) consider phenomenology as a practice whose purpose is to describe specific phenomena or the appearance of things and life experiences. The focus of phenomenology is on life experiences, because these are the experiences that make the meaning of any phenomenon for the individual and reveal the real facts (Haj Bagheri et al., 2017), and because the phenomenological method tries to describe human experiences in the context and context in which they occur and provides the richest and most descriptive information, using this method was suitable for clarification and deep description.

2.2. Participants

The research participants included professors and students who had virtual education experience. The number of participants in the research were 31 professors and students. They were selected based on criterion-based and chain sampling. Based on criterion-based sampling, only professors and students who had the experience of virtual education were selected. The number of samples was determined based on theoretical data saturation; that is, the number of interviews progressed until the researcher's information about the phenomenon was saturated and no other information was added after that. The characteristics of the participants in this research are presented in the following table:

Table 1.

Characteristics of participants of the research

Number	Field of Study	Education	Gender	Age	Years of experience
1	Sociology	Ph.D	Female	52 years	2 years
2	Family counseling	Ph.D	Female	46 years	4 years
3	Curriculum Development	Ph.D	Male	59 years	3 years
4	Psychology	Ph.D	Male	49 years	2 years
5	Agricultural Engineering	Ph.D	Male	41 years	4 years
6	Electrical Engineering	Ph.D	Female	48 years	3 years
7	Biology	Ph.D	Male	45 years	3 years
8	Geology	Ph.D	Female	62 years	2 years
9	Political Science	Ph.D	Female	55 years	4 years
10	Law	Ph.D	Male	44 years	3 years
11	Physical education	Ph.D	male	53 years	2 years
12	Mathematics	Ph.D	Female	48 years	3 years
13	Industrial Management	Ph.D	Male	61 years	4 years
14	Accounting	Ph.D	Female	47 years	4 years
15	History	Bachelor	Female	21 years	2 years
16	Educational psychology	Bachelor	Female	23 years	1 years
17	Philosophy	Ph.D student	Male	31 years	3 years
18	Computer Engineering	Master	Male	24 years	2 years
19	Geography	Bachelor	Female	20 years	1 years
20	Educational management	Master	Male	25 years	2 years
21	Civil Engineering	Bachelor	Female	21 years	2 years
22	Biology	Bachelor	Female	21 years	1 years
23	Mathematics	Master	Male	26 years	2 years
24	Psychology	Bachelor	Female	20 years	2 years
25	Literature	Ph.D student	Male	27 years	3 years
26	English language teaching	Master	Male	25 years	2 years
27	Political Science	Bachelor	Female	21 years	2 years
28	Law	Ph.D student	Male	28 years	3 years
29	Psychology	Bachelor	Female	20 years	1 years
30	IT Engineering	Master	Male	26 years	2 years
31	Philosophy	Ph.D student	Female	29 years	3 years

2.3. Research Instruments

Structured interviews were used to collect data. Each interview lasted between 35 and 45 minutes. All interviews were conducted in Persian. Some interviews were conducted online and some were conducted in person at the participants' workplaces. The paticipants’ consent was obtained and all of them were assured that their information

would remain confidential. In order to measure the validity of the research, the interview questions were modified and approved by 4 expert professors in the relevant field after they were designed. Also, all interviews were audio recorded. Then, the recorded interviews were carefully listened to by the researcher and translated into English and transcribed verbatim. After the recorded interviews were transcribed, the "peer review" method was used to confirm the validity of the interviews. In this way, the interview transcripts were sent to the participants to confirm the accuracy of the content and to edit it if necessary.

2.4. Data Analysis

Data analysis was done following thematic analysis method. The recorded interviews were listened to carefully by the researcher and transcribed verbatim. After the recorded interviews were transcribed, a "member review" method was used to verify the validity of the interviews. In this way, the transcript of the interview was sent back to the participants to confirm the accuracy and completeness of the content and to correct it if necessary. In the next stage, the data was coded into basic, organizing, and comprehensive themes. In the first stage, the researchers familiarized themselves with the interview texts by reading them. In the second stage, the primary themes (basic themes) were extracted from the interviews. In the third stage, the themes that had the highest frequency (organizing themes) were selected. In the final stage, the researcher tried to categorize the themes (comprehensive themes) based on their similarity.

3. Findings

After analyzing the interview data, one comperhensive theme, six first-level comprehensive themes, 22 second-level organizing themes, and 52 basic themes were identified which will be presented below. As Table 2 indicates, the first comprehensive theme which emerged was “Interaction and Communication Subculture”.

Table 2.

Interaction and Communication Subculture

Interaction and Communication Subculture	The dimension of scientific synergy	- Increasing the volume of scientific interactions - Accelerating scientific interactions - Disappearance of traditional barriers to scientific interactions
	Modification and optimization dimension	- Getting closer to each other within academic circles - Networking between university professors - Increasing interdisciplinary communication within the university
	The dimension of correction and optimization of inter-university scientific communication	- Increasing communication between different universities - Increasing communication between professors of different universities
	The dimension of reforming and optimizing international academic communication	- Increasing international scientific interactions - Accelerating the sharing of knowledge with international scientific societies
	The dimension of modification and optimization of interpersonal scientific communication	-Using new communication methods in scientific discussions - Improving and increasing communication efficiency between professors

Some extracts representing this category are as follows:

Participant No. 3:

In the past, when training was delivered through traditional methods, scientific communication among colleagues was relatively slow. However, with the advent of virtual training, the speed and efficiency of this communication have significantly increased.

Participant No. 7:

If desired, one can quickly connect and engage with extensive scientific networks using a mobile phone or laptop.

Participant No. 11:

In the past, there was limited communication between different university departments. However, virtual education has helped bridge that gap by enabling the

creation of various online platforms, associations, and academic circles that foster closer collaboration across disciplines.

Participant No. 7:

In the past, it was common for professors in each department or faculty to work independently in their own offices. However, with the rise of virtual and online education, these physical boundaries have been removed, leading many professors to engage in interdisciplinary and collaborative projects.

Participant No. 1:

The point I would like to emphasize concerns our own university: the promotion of virtual education has led to the development of a broad and effective connection between our university and other universities across the country.

Participant No. 14:

A key advantage of virtual education is the opportunities it has created for professors across different universities, fostering closer communication between faculty members at both small and large institutions.

Participant No. 6:

A simple comparison of scientific interactions before and after the rise of virtual education in the country's universities reveals a significant increase in international academic collaboration.

Participant No. 9:

Virtual education has facilitated access to international scientific communities, allowing for the easy exchange and sharing of knowledge.

Participant No. 8:

The use of various online systems and tools has enhanced the efficiency and speed of communication among professors, contributing to increased scientific productivity.

Participant No. 13:

By using various online communication tools, you can engage with colleagues anytime and anywhere, enabling real-time discussion of scientific matters.

As indicated in Table 3, the second comprehensive theme which appeared was “Scientific and Academic Processes Subculture”.

Table 3.

Scientific and Academic Processes Subculture

Scientific and Academic Processes Subculture	The dimension of academic commitment	- Decrease in compliance with academic standards and commitments among professors - Increasing the level of knowledge among professors - Increasing plagiarism
	The dimension of knowledge production and teaching implementation	- Improving the teaching process - Improving knowledge production using new methods - Collaborative teaching

A few extracts illustrating this theme are provided below:

Participant No. 10:

Unfortunately, virtual education has led to a diminished emphasis on scientific ethics, and the strong sense of commitment that once prevailed has, to some extent, weakened.

Participant No. 1:

One of the drawbacks of virtual education is the easy availability and repeated use of existing content without prior critical engagement. Some professors repeatedly present material already available online, resulting in little to no contribution of new knowledge.

Participant No. 6:

Virtual education has led to a diminished regard for copyright, resulting in widespread instances of scientific plagiarism.

Participant No. 13:

In traditional education, the primary teaching tool was the textbook, but with the growth of virtual education, a wide variety of teaching tools have become available.

Participant No. 5:

Online training and its associated tools have fostered creativity and synergy in knowledge production, while also accelerating the pace at which new knowledge is generated.

Participant No. 2:

Many professors have begun collaboratively teaching joint courses by forming online groups, which has enhanced the effectiveness of instruction.

"Emotional Subculture in Education" was the third comprehensive theme which emerged from data analysis. Table 4 displays the details of this theme.

Table 4.

Emotional Subculture in Education

Emotional Subculture in Education	Student	- Lack of emotional contact with the professor by the student - A loss of emotional connection between teacher and student
	Faculty Members	- Lack of emotional support among professors - Professors' individual emotional experiences in teaching - Loss of shared emotional connection between professors
	The physical dimension of the university	-The lack of vitality in the university's physical environment - The diminishing significance of the university's physical presence

The following extracts further demonstrate this theme:

Participant No. 7:

The physical presence of the professor in the classroom provides a sense of encouragement and security for students—an aspect that is unfortunately lacking in virtual education.

Participant No. 4:

In face-to-face education, an emotional bond develops between the professor and students, extending beyond academic and cognitive matters. This emotional connection tends to be lost in virtual education.

Participant No. 8:

The physical presence of professors within the faculty and the emotional support they offer each other are very important—yet these elements are largely absent in virtual and online education.

Participant No. 13:

In virtual education, professors often teach alone, isolated in a room. This method diminishes the socio-educational life of the professor, whereas in face-to-face settings, they benefit from the presence and interaction of fellow faculty members.

Participant No. 6:

Years of collaboration among faculty members in face-to-face education foster a shared emotional bond and a kind of emotional language that rarely develops in virtual environments.

Participant No. 10:

The very survival and vitality of a university depend on the physical presence of professors and students. Without them, this life force gradually disappears.

Participant No. 3:

Universities that fully transition to virtual education risk losing their physical and organic identity.

The next comprehensive theme was “Exclusion Subculture” the subcategories of which are presented in Table 5.

Table 5.

Exclusion Subculture

Exclusion Subculture	Student dimension	-Disappearance of student identity -Disappearance of student associations -Disappearance of student academic circles
	The faculty dimension	- Loss of professors' identity - Lack of effective communication and networking between professors - Loss of collaborative scientific projects
	Ideological dimension	-A perspective on virtual education -Strangeness with virtual education

	Structural dimension	-Destruction of the physical structure of the university - one-sided communications
	Learning dimension	-Increase in superficial learning -Increase in academic fraud

Below, a few quotes extracted from the participants' views are shown:

Participant No. 8:

Since the rise of virtual education, students are no longer the same as before. Classes are often not conducted effectively, and examinations lack integrity. The very notion of student identity has come into question.

Participant No. 2:

In the past two or three years, during the spread of COVID-19 and the rise of virtual education, most student associations and academic circles ceased to function, primarily because their activities were rooted in physical presence.

Participant No. 16:

With the growth of virtual education, many professors have shifted their focus to non-academic ventures. Some have become more engaged in business than in teaching or research, which has, in turn, diminished their professional identity.

Participant No. 7:

Virtual education has eliminated face-to-face interactions among professors, and as a result, many spontaneous brainstorming sessions—where some of our most creative research ideas emerged—no longer happen.

Participant No. 11:

In my view, virtual education cannot match the productivity of in-person learning. When comparing the outcomes of both, it's clear to me that face-to-face education yields stronger results.

Participant No. 9:

We need to first establish the necessary principles, rules, and norms for virtual education. Instead, we have jumped into it without proper preparation or understanding.

Participant No. 13:

Virtual education has halted the development and utilization of physical classrooms and university facilities. As a result, many resources remain unused, which is a significant loss.

Participant No. 3:

In a face-to-face classroom, you can easily engage with the instructor and receive immediate feedback. But in an online setting, poor internet connectivity and delayed instructor responses disrupt communication.

Participant No. 10:

Learning through online education is often incomplete and ineffective. Frequent internet disruptions make it difficult to follow the professor's explanations, and many students treat online classes casually, almost like a pastime.

Participant No. 1:

Since the introduction of online learning at universities, academic dishonesty has become widespread. One of my classmates used the same person to take all their exams and even organized a cheating group.

"Acceptance and Accessibility Subculture" was another theme which emerged from the interview data. Table 6 provides a synopsis of this theme and its sub-themes.

Table 6.

Acceptance Subculture

Acceptance Subculture	Scientific dimension	- Promotion of academic freedom - Reduction of academic authoritarianism - Elimination of exploitative academic practices - Removal of unofficial hierarchical influence among faculty members
	Educational dimension	- Enhancement of collaborative learning environments - Facilitation of accessible and transparent academic discourse - Improvement in overall student satisfaction with the learning experience

Example extracts which illustrate this theme are given below:

Participant No. 5:

One important point I'd like to emphasize is that virtual education has expanded academic freedom for both students and professors.

Participant No. 17:

In traditional classrooms, teachers often held excessive authority and saw themselves as the sole academic authorities. Thankfully, virtual education has shown us that there are multiple ways to acquire knowledge, and that teachers are not the only source of insight.

Participant No. 4:

Cyberspace, by its nature, allows large groups to interact simultaneously, which has significantly enhanced collaborative learning in education.

Participant No. 15:

Online education has introduced students to a wide range of educational software and tools. As a result, a shared technical language has emerged among them.

The last comprehensive theme which emerged from data analysis was "Neutrality and Indiference Culture". Table 7 provides details of this theme and its sub-themes.

Table 7.

Neutrality and Indifference Subculture

Neutrality and Indifference Subculture	Knowledge dimension	- Limited technological literacy - Viewing virtual education as distant or impersonal
	Attitudinal dimension	- Comparable learning outcomes in face-to-face and virtual education - Recognizing the futility of the debate between virtual and face-to-face education - Empowering students to choose their preferred mode of education - Lack of sufficient infrastructure for both virtual and in-person education
	Intellectual dimension	- Condition-based educational planning - Prioritizing the principle of meaningful learning over delivery mode

The following exepts further explain this theme and its dimensions:

Participant No. 8:

Some students and professors are not very familiar with technology, so the format of education—virtual or in-person—makes little difference to them.

Participant No. 12:

Unfortunately, a negative perception exists among some in our academic community who always view traditional, face-to-face education as superior and believe virtual education should only be used in emergencies.

Participant No. 9:

Whenever I talk to friends about virtual versus in-person education, some always claim there's no real difference between the two and say it doesn't matter which one is implemented.

Participant No. 3:

Some professors and students believe there should be no hierarchy between virtual and face-to-face education because prioritizing one over the other is unproductive.

Participant No. 11:

When there's a lack of educational infrastructure, it doesn't matter whether the mode is virtual or face-to-face—the problem remains the same.

Participant No. 1:

There is no one-size-fits-all solution; the choice between face-to-face and virtual education depends entirely on the specific circumstances.

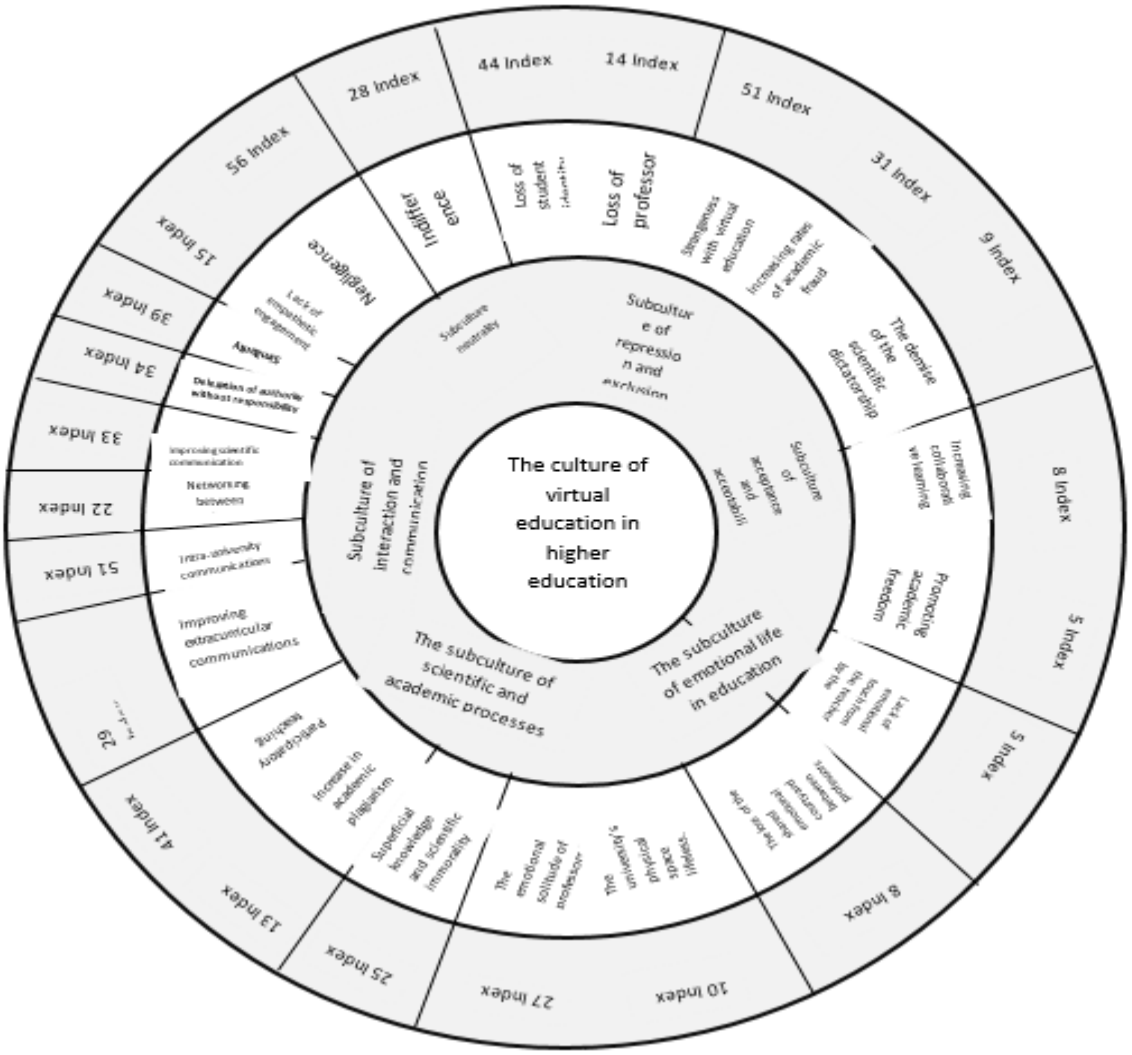
Participant No. 4:

It doesn't matter whether the education is delivered virtually or in person; what truly matters is that meaningful learning takes place—learning must be at the core of all educational activities.

The final model of this research on the culture of virtual education in higher education is illustrated in the following figure.

Figure 1.

Model of virtual education culture in higher education



4. Discussion and Conclusion

The results of the present study can be analyzed at both the student and professor levels. At the student level, three key subcultures are evident: the subculture of exclusion, the subculture of acceptance, and the subculture of neutrality and indifference. Students' responses to virtual education range from enthusiastic acceptance to outright rejection. Their beliefs, values, and learning styles significantly influence how they interact with and

perceive virtual education. These findings are consistent with prior research by Stoel (2017), McVey et al. (2017), Wang et al. (2015), Javadi et al. (2023), and Green et al. (2015). For example, Variki et al (2025) argue that the environment of virtual education is largely shaped by the attitudes of its participants. Motivation is particularly critical: students who lack interest often view virtual education as mere entertainment, leading to superficial engagement. Because virtual learning minimizes interpersonal communication and often takes on a game-like format, the entertainment dimension can overshadow its academic seriousness.

Beningoff (2015) emphasizes that networking and collaborative learning strategies enhance the effectiveness of virtual education. Some students view the instant and continuous nature of communication in virtual environments as a unique strength. Unlike traditional classrooms, where learning is confined within physical walls, virtual education allows learning to transcend those boundaries.

Hosseini et al. (2015) found that both organizational factors (structure, culture, leadership, technology) and individual factors (teacher expertise, student personality, and commitment) significantly affect the success of virtual education. Noraddin, (2015) concluded that e-learning challenges disciplinary, individual, and collective identities. Virtual education, therefore, has the potential to reshape the academic identities of both students and professors. Students whose personalities or identity structures conflict with the demands of virtual education may experience cognitive dissonance or even academic decline. Conversely, students who align well with the virtual learning environment often show significant academic improvement.

Another key feature of virtual education is the erosion of knowledge monopolies previously held by professors. Virtual platforms have broken the confinement of knowledge within the classroom and reduced opportunities for academic exploitation by a few dominant figures. Furthermore, virtual education introduces a new technical language, primarily involving educational software and hardware. Familiarity with this digital language enhances learning opportunities, while a lack of familiarity can significantly hinder learning.

A major drawback of virtual education is the elimination of in-person scientific

meetings, which, despite expanded access to online communication, has reduced the effectiveness of scholarly debate. In-person interactions still provide more meaningful engagement due to non-verbal cues like body language and facial expressions.

Additionally, superficial learning and academic dishonesty have become increasingly widespread in virtual settings. With diminished supervision, opportunities for academic fraud increase, and the reliability of information decreases. Students are central actors in virtual education, and understanding its impact on their learning styles necessitates a deep exploration of their lived experiences.

Due to its nature, virtual education brings with it distinct implications. The modes of communication, content delivery, and educational structure differ significantly from traditional models. These changes have resulted in new patterns of symbols, methods, practices, and traditions—constituting what can be described as the culture of virtual education.

In general, students can be categorized into three orientations: supporters of virtual education, who view it as liberating and empowering, especially in terms of academic freedom and reduced dominance by professors. Critics, who argue that it has undermined both student and professor identities and diminished academic seriousness and collaboration. Neutral participants, who perceive little difference between virtual and traditional education and advocate for context-driven approaches to educational delivery. Understanding these subcultures is essential for implementing virtual education effectively. Educational stakeholders and policymakers must account for these attitudes when designing or reforming virtual education systems.

At the professor level, three subcultures emerged: the subculture of interaction and communication, the subculture of scientific and academic processes, and the subculture of emotional education. These dimensions reveal that the culture of virtual education is deeply intertwined with how professors experience communication, scientific engagement, and emotional connection.

These findings are consistent with previous research by Harvey (2022), Grothaus (2022), Dudian et al. (2022), Hosseini et al. (2015), and Wang et al. (2015). For example, Kok et al. (2024) argue that virtual education has significantly expanded scientific

communication, both within and beyond university settings. This increase in interaction has promoted scientific synergy and accelerated the pace of knowledge production. Beningoff (2015) also confirms that collaborative and networked learning approaches are effective within virtual environments.

Professors have used digital tools to dismantle traditional physical boundaries, forming new academic networks that promote collaboration and knowledge exchange. However, concerns persist regarding academic integrity. Borderick (2020) notes that virtual education often lacks strict adherence to scientific ethics, resulting in increased plagiarism and diminished scholarly rigor. This aligns with findings in the current study, where some professors admit to neglecting copyright and proper academic adaptation in online contexts. Despite these challenges, virtual education offers benefits such as innovative teaching tools and more engaging instructional methods through modern communication technologies.

A particularly critical dimension is the emotional life of professors and students. Spriti & Badrhani (2025) identified emotional disconnection as a major weakness of virtual education. The shift to online formats has disrupted emotional ties between teacher and student, among colleagues, and between individuals and the university environment. In many cases, this results in what may be termed emotional death—a profound sense of disconnection and loss of academic community.

Virtual education disrupts emotional bonds and reduces the vibrancy of physical university spaces. As the physical presence of professors and students diminishes, the symbolic and emotional significance of the campus erodes. While some professors emphasize the communicative and academic advantages of virtual education, others stress its emotional shortcomings. For the former group, virtual education facilitates broader academic interaction and access to teaching tools. For the latter, it contributes to emotional fragmentation, social disconnection, and a declining sense of community—issues that extend to the university's physical and symbolic identity.

Given these insights, the culture of virtual education—especially from the perspective of professors—offers critical lessons for curriculum designers and decision-makers. Educational stakeholders must consider these cultural dimensions to ensure the

success and sustainability of virtual education. Given the presence of a subculture of exclusion, it is recommended that the value-based and attitudinal dimensions of stakeholders be assessed and addressed. The existence of a subculture of neutrality and indifference calls for increased awareness and sensitivity regarding the complexities of virtual education. Since emotional life is disrupted in virtual education, greater attention should be paid to the emotional experiences of both professors and students. As the spatial dimension is diminishing in virtual settings, it is essential to rethink and redefine the concept of place in virtual education. Regarding emotional life, the concept of the "other" in virtual education should move beyond current stereotypes and be reimagined. In light of the emotional challenges identified, it is vital that emotional engagement becomes a central consideration for planners of virtual education.

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