Innovation in Language Testing and Teaching (ILTT)
Volume 2 Issue 1 Year 2026 Pages 1 - 23
E–ISSN : 3110-5483 | DOI: 10.61227
E-mail : iltt.pusmedia@gmail.com
https://journal.pusmedia.com/index.php/ILTT/index

A Quasi-Experimental Examination of a WebQuest-Based Flipped Classroom Model on EFL Learners' Critical Thinking and Listening Comprehension Performance

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Abstract : Listening comprehension is widely recognized as one of the most demanding skills for second or foreign language learners. As an innovative pedagogical tool combined with an inverted instructional design, the WebQuest-based flipped classroom has the potential to enhance both learners' critical thinking and listening comprehension abilities. To this end, the present study employed a mixed-methods design to investigate the effects of this scaffolded, inquiry-oriented approach on the critical thinking and listening skills of English as a foreign language (EFL) learners. Participants' language proficiency was assessed using the DIALANG test. Critical thinking skills were measured with the California Critical Thinking Skills Test (CCTST) Form B, while listening comprehension was evaluated through IELTS-based listening tasks. Furthermore, a semi-structured interview based on Hung's model was administered to explore learners' perceptions and attitudes toward the WebQuest-based flipped classroom. Quantitative data were analyzed using one-way MANOVA and one-way MANCOVA. The results indicated that the WebQuest-based flipped classroom significantly outperformed the conventional face-to-face classroom on both the immediate post-test and the delayed post-test, while also requiring fewer instructional sessions to cover the same content. Thematic analysis of the qualitative data revealed predominantly positive perceptions among learners regarding the impact of the WebQuest-based flipped classroom. The findings offer pedagogical implications for language teachers and researchers.

Keywords: critical thinking, listening comprehension, Flipped classroom, WebQuest

Article info: Submitted : 2026-05-14 | Accepted : 2026-06-08 | Published : 2026-06-08

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INTRODUCTION

The rapid integration of technology into language education has fundamentally reshaped instructional practices, shifting the focus from teacher-centered to learner-centered paradigms (Karabatak & Polat, 2024; Namaziandost, Heydarnejad, & Azizi, 2025). Among the various digital innovations, WebQuest has emerged as an effective inquiry-oriented instructional tool that guides learners to navigate and synthesize online

information within authentic, problem-solving contexts (Dodge, 1995; Karimi & Nazari, 2018). When integrated into a flipped classroom model—where direct instruction is delivered outside class via digital media and class time is devoted to active, collaborative learning—WebQuests can foster deeper engagement and self-regulated learning (Bergmann & Sams, 2014; Merc & Demir, 2017). However, empirical investigations that specifically combine WebQuest with flipped learning to concurrently target both higher-order thinking skills and receptive language abilities remain notably sparse, particularly within English as a Foreign Language (EFL) contexts.

Recent systematic reviews have affirmed the efficacy of flipped classroom approaches in enhancing EFL learners' listening skills, fostering learner autonomy, and reducing language learning anxiety (Pongpanich et al., 2025). Nevertheless, existing research has primarily examined listening comprehension and critical thinking in isolation, leaving the interaction between these two constructs under WebQuest-based flipped conditions largely unexplored (Yang & Valcke, 2025; Yu, Petsangsri, & Sitthiworachart, 2026). Moreover, while integrated motivational designs such as ARCS-flipped models have demonstrated promising effects on listening proficiency (Yu et al., 2026), studies employing robust sequential mixed-methods designs to capture both quantitative outcomes and learner perceptions of WebQuest-based flipped instruction are still limited (Talat, Javaid, & Al Ghotheify, 2026). The present study seeks to address these gaps by systematically investigating the Kmpact of a WebQuest-based flipped classroom on Korean EFL learners' critical thinking and listening comprehension skills.

Educational systems have always sought to create situations in which students are at the center of the learning process while taking ownership of the educational procedure (Shea et al., 2012). The focus of this educational approach is on reinforcing proficiency and practice, which can lead to long-lasting learning and independence in problem-solving (Young & Paterson, 2007). A promising way to meet the needs of creating a student-centered environment is the use of online applications (Chen, Shih, & Liu, 2015; Ebadi & Rahimi, 2017; Ravid, Kalman, & Rafaeli, 2008; Zorko, 2009). These methods help teachers facilitate students' problem-solving activities (Milman, 2012) and assess collaborative learning (Yim & Warschauer, 2017). The theory and practice of student-based learning methods are aligned with constructivist learning theory, which emphasizes the critical role of learners in forming new concepts.

Relatedly, Bergmann and Sams (2014) contended that the flipped approach is straightforward and can easily fit into any class type and teaching context. As an innovative pedagogical approach, Guo (2019) believes that a flipped classroom is a model that increases learners' interaction, improves assistance from instructors and peers for homework, and allows more class time for discussion. Moreover, this type of classroom

emphasizes learners' preparation before class and involves blended learning and distance learning through ready-made educational videos from various websites (Hung, 2015).

On one hand, past research has affirmed that listening is the most widely used language skill in daily communication (Rost, 2002). However, as Renukavedi (2014) argued, this skill has not received sufficient attention in the curriculum and, therefore, needs greater emphasis in language learning contexts. On the other hand, critical thinking, as responsible thinking and cognitive skills, facilitates good judgment and encompasses a range of higher-order thinking skills, such as analysis, inference, evaluation, and deductive and inductive reasoning, which are intended to be taught and transferred. It can be conceptualized either as cognitive skills or as social and emotional dispositions (Yenice, 2011). By teaching "how to think rather than what to think," learners become engaged in their actions and develop their own opinions (Sharma, 2011).

Furthermore, designing a WebQuest-based learning environment is an effective strategy for developing various variables in EFL contexts. However, few research studies seem to have been conducted to explore WebQuest-based classrooms in EFL settings (Chou, 2007). In particular, some scholars believe that WebQuest-based classrooms are effective in developing both learners' critical thinking and listening comprehension (e.g., Chou, 2007; Mercer, Hennessy, & Warwick, 2019). Nevertheless, the impact of WebQuest-based classrooms on EFL learners' critical thinking (i.e., analysis, evaluation, inference, deductive and inductive reasoning) and listening comprehension skills has remained largely unexplored. Yet, this type of classroom and teaching provides opportunities for meaningful content, authentic materials, and collaboration among students (Simina & Hamel, 2005). Therefore, exploring critical thinking and listening comprehension skills through WebQuests may be more feasible, which can subsequently illuminate profound insights into how these particular skills are developed in EFL learners.

As a result, this study attempts to investigate EFL learners' critical thinking and listening comprehension skills as influenced by the WebQuest-based flipped classroom compared to the face-to-face classroom. To obtain more acceptable and accurate results, the researcher employs a sequential mixed-methods approach. Therefore, the following research questions were addressed:

1. RQ1: How does a WebQuest-based flipped classroom compare to a traditional face-to-face classroom in enhancing EFL learners' critical thinking and listening comprehension skills?
2. RQ2: What are EFL learners' attitudes and perceptions regarding the effect of a WebQuest-based flipped classroom on their critical thinking and listening comprehension abilities?

Literature Review

In recent years, the integration of innovative instructional technologies into language education has garnered increasing attention from researchers and practitioners alike. Among these innovations, the flipped classroom model has emerged as a particularly promising pedagogical approach, with a growing body of evidence supporting its effectiveness in enhancing various language skills, including listening comprehension and higher-order thinking abilities (Pongpanich et al., 2025; Jantakoon et al., 2025). Concurrently, a comprehensive systematic review by Yang and Valcke (2025) examining flipped classroom implementation in EFL listening instruction confirmed that this model significantly improves learners' listening performance while simultaneously fostering learner autonomy and reducing language learning anxiety. Furthermore, recent meta-analytic evidence has demonstrated a moderate positive impact of the flipped classroom model on overall EFL learner competence (effect size = 1.99), underscoring the pedagogical value of this approach across diverse instructional contexts (Jantakoon et al., 2025). Specifically designed as an inquiry-based, technology-enhanced learning environment, the WebQuest approach has been identified as a particularly effective strategy for structuring flipped learning activities, as it guides students through authentic, problem-solving tasks that require active engagement with online resources (Dodge, 1995; Ebadi & Rahimi, 2017).

Abeysekera and Dawson (2015) indicated that since the flipped classroom approach involves both out-of-class and in-class activities, it tailors individualized instruction to diverse learners' proficiency, which in turn manages the learning's cognitive load. In a flipped classroom, students work collaboratively on the materials already prepared and delivered, which requires them to learn key concepts and processes using the information offered in the flipped instruction. Moreover, before the instructor begins the instruction by WebQuests, some online digital materials are offered to the learners through this approach (Ebadi & Rahimi, 2017). Therefore, some connection will occur in the classroom using the Internet (McManus, 2000), supplying learners with different knowledge and information sources. In a WebQuest program, the goals of the learning and prerequisite data are supplied as the first phase. After that, the learners' functions will be clarified as a way of developing interaction and exchanging opinions between them (Lin & Atkin, 2014; Ricalde, Hernandez, & Luna, 2013). As a consequence of this kind of preparation, the learners become familiar with the title and get more active in face-to-face classes.

As an alternative learning instrument, this program permits learners to understand the lessons by reviewing the accessible sources of the web (Nolan & Washington, 2013), and makes them more autonomous in language learning (Critz &

Knight, 2013; Schmidt & Ralph, 2014). Its basic theoretical framework is based on constructivism, which considers learning as a process that actively constructs knowledge (Duffy & Cunningham, 1996). Based on this viewpoint, WebQuests involve learners in cooperative learning in which each learner is engaged in constructing knowledge to scaffold the in-class introduction (Irzawati & Asiah, 2013; Tuan, 2011).

Additionally, some scholars maintain that WebQuests consist of research-oriented tasks that improve higher-order thinking skills in general (Barak & Shakhman, 2008; Lee, 2014) and critical thinking skills in particular (March, 2004; Ku, 2009; Vidoni & Maddux, 2002). In the same vein, Aydin (2015) pointed out that WebQuests are efficacious instruments in advancing critical thinking and other higher-order thinking skills, and that learners are more co ntented with learning linguistic and extra-linguistic knowledge when applying them. Closely related, Sen and Neufeld (2006) proposed that WebQuests supply EFL learners with significant and effective data to think critically, critically evaluate, and intelligently use Web-based resources through individual and autonomous meaning construction.

Similarly, March (2004) argued that learners not only obtain information in WebQuest learning environments but also use that information actively to achieve specific objectives by involving themselves in critical thinking activities which involve problem-solving, judgement, analysis, and synthesis. Likewise, Ikpeze and Boyd (2007) clarified that WebQuests supply different activities for in-depth study of content, and facilitate critical and complex thinking skills through evaluating the Web resources for determining the authenticity of information and critiquing different texts. They suggested that teachers' creativity and flexibility in selecting the activities for students determined the success of WebQuests.

Besides, Puthikanon (2009) in his study claimed that learners actively analyzed, synthesized, and reflected on information about the topic when applying WebQuest. These mental skills, which are at the core of critical thinking (Facione, 2011), are also employed in listening comprehension. Ikpeze and Boyd (2007) documented that these programs provide diverse content activities that pave the way for critical thinking skills through evaluating web resources. This supports the choice of WebQuest to develop EFL learners' listening comprehension. In addition, the findings of Abaeian and Samadi's (2016) research on the flipped model revealed that this model is more effective for intermediate students compared to upper-intermediate ones.

On the other hand, Al-Nasser (2015) argued that a particularly important skill that has suffered from educational inconsistencies is listening. Instead, this skill naturally improves more rapidly than the other three language skills (Al-Khresheh, Khaerurrozikin, & Zaid, 2020; Oxford, 1990). Moreover, the results of some research

showed that listening forms the basis for ultimately achieving language proficiency (Gilbert, 1998; Scarcella & Oxford, 1992; Graham & Macaro, 2008; Renukavedi, 2014; Kassem, 2015).

METHODOLOGY

Participants

Two intact classes from a private language institute in Seoul, South Korea, were selected. One of these classes was randomly assigned as the experimental group and the other as the control group. Convenience sampling (Dörnyei, 2007) was used to select the participants. Each class consisted of ten EFL learners aged 18-24, with Korean as their first language. These learners were attending an IELTS preparation course to improve their four language skills (reading, writing, speaking, and listening) in order to take the actual IELTS test.

Prior to the intervention, written informed consent was obtained from all participants, and they were assured of the confidentiality of their data. Both groups received instruction over twelve 90-minute sessions. The experimental group was taught using a WebQuest-based flipped classroom approach, while the control group received the same content through traditional face-to-face instruction. A standardized pre-test and post-test of listening comprehension and critical thinking were administered at the beginning and end of the course to measure progress.

Materials and Instruments

To assess the English proficiency levels of the participants, the DIALANG test was employed. DIALANG is a diagnostic online language assessment system designed for European languages. It evaluates language skills, reports scores, and provides diagnostic feedback aligned with the Common European Framework of Reference for Languages (CEFR) (Huhta et al., 2002). Since the present study primarily focused on listening comprehension, only the listening section results—reported across six levels from A1 to C2—were taken into account. The listening proficiency level of the participants was determined to be B1. Because the learners had no prior familiarity with the WebQuest-based flipped classroom approach, the instructor provided them with necessary guidelines. To ensure anonymity and protect participant identities, learners in the experimental group were labeled E1, E2, …, E10.

For measuring the participants' critical thinking skills, the California Critical Thinking Skills Test (CCTST) Form B, developed by Facione and Facione (1993), was used. This test assesses five sub-skills: analysis, evaluation, inference, deductive reasoning, and inductive reasoning. It consists of 34 multiple-choice questions, each of which measures one or more sub-skills simultaneously. Facione, Facione, Blohm,

Howard, and Giancarlo (1998) reported that the test had acceptable reliability (KR-20 = .78) and accurately measured what it intended to measure (i.e., construct validity).

Furthermore, participants' listening comprehension skills were assessed using IELTS-based listening tasks. In these tasks, candidates listened to four recordings—a mixture of monologues and conversations by various native speakers—with each recording played only once. Ten questions accompanied each part of the listening test, measuring the test-takers' ability to understand main ideas, detailed factual information, speakers' opinions and attitudes, and the purpose of utterances. To reduce potential scoring bias, inter-rater reliability was examined. An experienced IELTS instructor rescored the pre-tests, post-tests, and delayed post-tests to ensure consistency. The two sets of scores showed high agreement ($r = 0.82$).

To explore participants' perspectives and attitudes toward the WebQuest-based flipped classroom in improving their listening comprehension, a semi-structured interview based on Hung's model (Hung, 2015) was administered. The interviews were recorded, transcribed, and coded for subsequent thematic analysis. Member checking (Creswell, 2007) was employed to enhance the credibility of the interview findings, ensuring that interviewees fully understood each question, which in turn contributed to the trustworthiness of the results.

Procedure

As part of the pre-test phase, the CCTST Form B was administered to the participants to measure their baseline critical thinking skills. Similarly, an IELTS-based listening comprehension task was used as another pre-test to assess their initial listening ability. In this task, participants were required to identify main ideas and detailed factual information. They listened to four recordings—a mix of monologues and conversations by various native speakers—and answered the corresponding questions within approximately 30 minutes.

In the experimental group, the researcher (who also served as the instructor) designed a WebQuest aimed at developing the learners' critical thinking and listening comprehension skills. Since the learners were unfamiliar with how to effectively engage with the WebQuest-based flipped classroom, a training session was provided during the first meeting of the course.

Drawing on open educational resources and open educational practices (Borthwick & Gallagher-Brett, 2014), the WebQuest incorporated general guidelines and explanations, ready-made educational videos, other e-learning materials, and useful links to reputable websites. This allowed participants to access and study the materials before class, enabling them to initiate collaborative practice and discussion of critical thinking

and listening comprehension tasks. Moreover, the researcher/instructor assisted learners in navigating the WebQuest, facilitated in-class collaboration, and supported open-editing of content.

Following a process-oriented approach to listening instruction, in each session learners were first given a listening task to practice comprehension and identify potential problems. Subsequently, at home, they explored the WebQuest for relevant sources related to critical thinking and listening comprehension, analyzed and synthesized the information, and completed the assigned tasks. During class time, they carried out the activities and, if necessary, revised or modified their answers to the listening comprehension questions.

In the control group (face-to-face classroom), traditional instruction was implemented to enhance learners' critical thinking and listening skills. Similar to the experimental group, the control group received initial instruction on content-related issues at the beginning of the course. In the following sessions, they were given listening tasks along with specific problems to address. At home, they reviewed printed materials related to critical thinking and listening comprehension and completed the tasks. Afterwards, they discussed their completed work in the classroom and made revisions or corrections as needed.

In the WebQuest-based flipped classroom, interaction occurred at three levels: between learners and the technological medium, between learners and the researcher/instructor, and among learners themselves. In contrast, interaction in the face-to-face classroom took place only among learners. The outcome in both groups was a completed listening task. Both classroom settings served primarily as platforms for formative and summative assessments of learners' critical thinking and listening comprehension skills.

At the end of the intervention, as a post-test measure, the researcher again administered the CCTST Form B to assess the learners' critical thinking skills. Likewise, IELTS listening comprehension tasks of comparable difficulty and following the same procedures were used to measure their listening ability. Table 1 summarizes the pre-test, post-test, and delayed post-test information related to the IELTS listening tasks for both groups.

Table 1.
IELTS Listening Tasks Used for the Pre-Test, Post-Test, and Delayed Post-Test.

	Task	Topic	Time
Pre-test	Recording 1	Main ideas and factual information,	30 minutes
Post-test	Recording 2	The opinions and attitudes of	30 minutes
Delayed post-test	Recording 3	speakers, and The purpose of the utterances.	30 minutes

Furthermore, in order to explore learners' perceptions of how the WebQuest-based flipped classroom contributed to the development of their critical thinking and listening comprehension skills, semi-structured interviews were conducted individually with all participants. To avoid any potential misunderstanding, the interviews were carried out in Korean and later translated into English for thematic analysis. Each interview session lasted approximately 15 minutes. Such interviews are commonly employed in qualitative research to identify and interpret underlying themes and categories embedded within processes and events (Boyatzis, 1998).

Data Analysis

1. Quantitative Data Analysis

The present study involved two dependent variables—critical thinking and listening comprehension skills, each comprising several sub-components—and one independent variable (WebQuest-based flipped classroom) with two distinct levels: WebQuest-based instruction and traditional face-to-face instruction. Therefore, a one-way multivariate analysis of variance (MANOVA) was initially conducted to examine group differences in the pre-test scores for both critical thinking and listening comprehension. Subsequently, a one-way multivariate analysis of covariance (MANCOVA) was performed to assess the effect of the WebQuest-based flipped classroom compared to the face-to-face classroom on the dependent variables, while controlling for pre-test scores (as covariates) and then comparing the post-test and delayed post-test results. Normality of the data was checked using the Kolmogorov-Smirnov test. The results indicated that the pre-test, post-test, and delayed post-test data were all non-significant, confirming that the data were normally distributed and free of outliers.

2. Qualitative Analysis

To identify the key themes emerging from EFL learners' perceptions of how the WebQuest-based classroom influenced their critical thinking and listening comprehension skills, as well as from the researcher/instructor's journals (i.e., diaries and notes maintained throughout the study), thematic analysis was employed (Boyatzis, 1998). To achieve this, the transcribed interview data and the instructor's journal entries were coded and analyzed using open thematic coding. The relationships among the core variables were then examined to organize them according to their content, and subsequently, each cluster was assigned a label that captured the shared theme within that cluster. An iterative, bottom-up approach was adopted to identify the core variables and classify them into relevant categories.

RESULTS AND DISCUSSION

Results

1. The Quantitative Analysis

a. Critical Thinking and Listening Comprehension

Initially, a one-way MANOVA was conducted to assess any differences between the experimental and control groups on the pre-test measures of critical thinking and listening comprehension. The descriptive statistics for these analyses are presented in Table 2.

Table 2.
Descriptive Statistics, Investigating the Amount of Mean Differences Between the Pretests of Both Groups.

	Groups	Means	Std. Deviation	N
Critical thinking(pre-test)	Ex	3.600	2.263	10
	Co	3.500	1.429	10
Listening(pre-test)	Ex	3.700	.788	10
	Co	3.650	.754	10

As shown in Table 2, only minor differences were observed between the mean pre-test scores of the two groups. This suggests that the participants' initial levels of critical thinking and listening comprehension were comparable across both groups. The outcomes of the one-way MANOVA are presented in Table 3.

Table 3.
Tests Of Between-Subjects Effects, Investigating the Critical Thinking and Academic Writing Differences Between the Two Groups.

Dependent variable	Type III sum of Scores	Df	Mean Square	F	Sig
Critical thinking(pre-test)	.050	1	.050	.014	.907
Listening(pre-test)	.013	1	.013	.021	.886

Table 3 indicates that no statistically significant differences were found between the two groups in terms of their critical thinking and listening comprehension scores at the pre-test stage.

Prior to the primary analyses, a preliminary one-way MANCOVA was conducted to test the underlying assumptions, specifically examining the homogeneity of variance-covariance matrices and the homogeneity of regression slopes. The results showed that the linear relationship between the independent variable (WebQuest-based classroom) and the covariates (pre-test scores) was not significant, and the interaction effects between the independent variable and the covariates on both the post-tests and delayed post-tests were also non-significant. These findings collectively satisfied the assumptions required for conducting a one-way MANCOVA.

Consequently, the main one-way MANCOVA was performed to investigate the effect of the WebQuest-based classroom versus the traditional face-to-face classroom on the participants' post-test and delayed post-test scores in critical thinking and listening comprehension, after controlling for the pre-test scores as covariates. Table 4 presents the unadjusted mean differences between the two groups on the post-tests and delayed post-tests prior to covariate adjustment.

Table 4.
Descriptive Statistics, Investigating the Amount of Unadjusted Mean Differences Between the Post-Tests and Delayed Post-Tests of Both Groups Before Controlling for the Pretests (Covariates).

	Group	Mean	Std.Deviation	N
Critical thinking	Ex	9.200	2.221	10
	Co	6.400	1.766	10
Listening(post-test)	Ex	6.350	.625	10
	Co	5.050	1.012	10

Critical thinking(delayed-post)	Ex	10.000	2.494	10
	Co	7.100	2.183	10
Listening(delayed-post)	Ex	6.400	.674	10
	Co	4.850	.944	10

As presented in Table 4, the experimental group achieved higher mean scores than the control group on both the post-tests and delayed post-tests for critical thinking and listening comprehension. This suggests that the instructional approach implemented in the experimental group may have been more effective than that of the control group.

Table 5 presents the results of the multivariate tests using Wilks' Lambda to assess the effect of the WebQuest-based classroom on the combined dependent variables of critical thinking and listening comprehension. The findings indicated that, after controlling for pre-test scores, both the WebQuest-based and the face-to-face classroom conditions had a significant impact on learners' critical thinking and listening comprehension outcomes.

Table 5.
Multivariate Test, Conducting Wilk's Lambda to Investigate The Effect of the Covariates and the Independent Variable on the Dependent Variables.

Effect	Value	F	Hypothesis df	Error df	Sig
WebQuest-based flipped and face-to-face classrooms	.302	7.527	4.000	13.000	.002

Table 6 presents the results of the tests of between-subjects effects, which were conducted to examine the differences between the WebQuest-based and face-to-face classroom conditions, as well as their respective effects on participants' post-test and delayed post-test scores for critical thinking and listening comprehension, after statistically controlling for pre-test scores.

Table 6.
Tests of Between-Subjects Effects, Investigating the Impact of the Independent Variable on the Dependent Variables After Controlling for the Covariates

Dependent variable	Type III sum of Scores	Df	Mean square	F	Sig
CT(post)	34.958	1	34.958	9.328	.008
Listening(post)	8.132	1	8.132	12.227	.003

CT(delayed-Post)	41.463	1	41.463	7.089	.017
Listening(delayed-post)	16.599	1	16.599	28.189	.000

The findings presented in Table 6 indicate that, after controlling for pre-test scores, the WebQuest-based classroom exerted a positive and statistically significant effect on both the post-test and delayed post-test measures of the EFL learners' critical thinking and listening comprehension skills. Table 7 provides the adjusted mean differences between the two groups on the post-tests and delayed post-tests, following the control for pre-test scores.

Table 7
Descriptive Statistics, Investigating the Amount of Adjusted Mean Differences of The Post- Tests and Delayed Post-Tests of Both Groups After Controlling for the Pre-Tests.

Dependent variable	Group	Mean	Std.Error	95% confidence Interval	
				Lower bound	Upper bound
CT(post-test)	Ex	9.373	.612	8.075	10.671
	Co	6.427	.612	5.429	8.025
Listening(post-test)	Ex	6.338	.258	5.791	6.885
	Co	5.062	.258	4.515	5.609
CT(delayed-post)	Ex	9.991	.765	8.369	11.613
	Co	7.109	.765	5.487	8.731
Listening(delayed-post)	Ex	6.687	.243	6.172	7.201
	Co	4.863	.243	4.349	5.378

Table 7 shows that, after adjusting for pre-test scores, the experimental group's adjusted mean scores on both the post-tests and delayed post-tests of critical thinking and listening comprehension were higher than those of the control group.

Moreover, Table 8 indicates that, following control for pre-test scores, the experimental group significantly outperformed the control group on the post-test and delayed post-test measures of both dependent variables. These findings suggest that the WebQuest-based classroom was a more effective instructional approach than the traditional face-to-face classroom for developing EFL learners' critical thinking and listening comprehension. Additionally, the WebQuest-based classroom had a lasting (long-term) effect on the development of both skills. In contrast, the face-to-face classroom demonstrated a long-term effect only on critical thinking development.

Table 8.
Pairwise Comparisons, Investigating the Exact Differences of the Post-Tests and Delayed Post Tests of Both Groups After Controlling for the Pre-Tests.

Dependent variable	(I)Group	(J)Group	Mean difference (I-J)	Std.error	Sig	95% confidence interval for Difference Lower	upper
Critical thinking(post-test)	Ex	Co	2.606	.845	.007	.823	
	Co	Ex	-2.606	.845	.007	-4.389	
Listening(post-test)	Ex	Co	1.264	.360	.003		
	Co	Ex	-1.264	.360	.003		
Critical thinking(delayed-post)	Ex	Co	2.855	1.065	.016		
	Co	Ex	-2.855	1.065	.016		
Listening(delayed-post)	**Ex**	**Co**	1.814	.349	.000		
	Co	**Ex**	-1.814	.349	.000		

2. The Qualitative Analysis

The second research question of the present study explored EFL learners' attitudes and perceptions regarding the influence of the WebQuest-based classroom on their critical thinking and listening comprehension skills. The aim of this qualitative component was to interpret, elaborate on, and further elucidate the quantitative results—specifically, to understand why the WebQuest-based classroom led to greater improvements in learners' critical thinking and listening comprehension. To achieve this, learners in the WebQuest-based classroom were interviewed to articulate and reflect on their learning experiences. Additionally, the researcher/instructor maintained journals throughout the course to document observations of the learners' experiences, thereby enriching the qualitative findings. Following thematic analysis of the transcribed interviews and the instructor's journals, several themes emerged. These results are summarized in Table 9.

Table 9.
Themes of the EFL Learners' Attitudes and Perceptions Towards the Impact of Webquest-Based Classroom on Critical Thinking and Listening Comprehension Skills.

Themes
- The contents of educational videos and other e-learning materials and the way they are structured in the *WebQuest*
- The possibility of choosing what and how to learn in the active learning environment of the WebQuest-based classroom

- The amount of time and effort to learn the content of the videos and other e-learning materials
- The discussions in the classroom about the videos and other e-learning materials
- The positive feelings to participate in class activities which meet different proficiency levels

Overall, the findings revealed that learners held positive perceptions and attitudes toward the influence of the WebQuest-based classroom on their critical thinking and listening comprehension skills, which in turn supported and reinforced the quantitative results.

According to the findings, the typical study approach adopted by EFL learners in the WebQuest-based classroom involved reviewing and studying the videos and other e-learning materials related to critical thinking and listening comprehension before class in order to come prepared. Then, during class time, they engaged in collaborative practice and discussion of these skills. Learners reported that the educational videos and other digital materials enhanced their critical thinking and listening comprehension because all necessary details were clearly presented. For example, L8 stated:

> "*The videos and materials are quite helpful. I become familiarized with every detail of listening comprehension tasks and I know how to come up with the answers to the questions of different types.*"

The abundance of relevant online resources gave learners opportunities to read a substantial amount of useful material about critical thinking and listening comprehension before completing exercises. Learners reported that classroom discussions about the videos and other materials deepened their understanding. They indicated that they learned a great deal from their peers, as classmates shared different interpretations of certain materials. As L1 reported:

> "*I view the videos and peruse the materials several times at home and write down some notes that I think are difficult, and then mention them in the class. This learning process is quite useful for me because my classmates have different ideas and I can learn them all in the classroom discussions.*"

Classroom discussions allowed learners to exchange diverse and valuable ideas and suggestions, which in turn helped other learners develop their skills. For instance, L10 stated:

> "*This learning process is very useful for me because I can view the videos and read the materials at my own pace. I think in comparison with some of my classmates I need more time to understand the materials deeply, and it is really great that I have enough time in this learning process. As I learn all about the materials of the session I feel emotionally relaxed in the classroom, so I take part in the discussions a lot.*"

The provision of such collaborative discussions not only substantially developed learners' critical thinking and listening comprehension skills but also motivated them to work more diligently on their assigned tasks.

In summary, EFL learners' perceptions of the WebQuest-based classroom's impact on their critical thinking and listening comprehension skills were positive. The only difficulty they reported was related to low-speed Internet connectivity.

Discussion

A sequential explanatory mixed-methods design was employed for data collection and analysis. The quantitative results initially demonstrated that the WebQuest-based classroom was more effective and efficient than the traditional face-to-face classroom in fostering learners' critical thinking skills, both in the short term and over an extended period. In terms of CCTST scores, the experimental group averaged 3.6 and the control group 3.5 on the pre-test, while on the post-test the experimental group averaged 9.2 compared to the control group's 6.4. According to Facione and Facione (1993), CCTST scores of 12 indicate fundamental weaknesses in critical thinking; therefore, learners in both groups were initially considered weak in this area. Nevertheless, the participants in this study managed to progress from their existing ability level—a modest yet welcome improvement. Drawing on Vygotsky's (1978) sociocultural theory of mind, any change in learners' current capabilities is regarded as development. The present findings indicate that the WebQuest-based classroom enhanced the critical thinking skills of these relatively weak critical thinkers more effectively and efficiently than the face-to-face approach.

These outcomes may be attributed to structural differences between the two instructional conditions. In the WebQuest-based classroom, learners had additional time before class to reflect on learning activities. During class sessions, they enjoyed ample opportunities to interact with peers and the researcher/instructor regarding the content of videos and other web-based materials, thereby using class time for more applied learning. Moreover, increased learner-teacher interaction allowed the instructor to better assess and facilitate each session's learning process. Another advantage of the WebQuest-based classroom was its use of an active learning strategy structured around the five essential WebQuest components: Introduction, Process, Task, Evaluation, and

Conclusion. This design provided learners with curated websites and instructional videos, preventing them from spending excessive time searching the vast Internet.

These findings align with previous studies reporting that WebQuest-based instruction develops learners' critical thinking skills (Aydin, 2015; Sen & Neufeld, 2006; Vidoni & Maddux, 2002). Similarly, Zheng et al. (2008) characterized WebQuests as an educational tool for constructivist learning that further engages learners in critical thinking. A plausible explanation for the present results is the distinctive capacity of WebQuests to provide in-depth content understanding, achieved through the application of critical thinking and other higher-order thinking skills.

Furthermore, the quantitative findings demonstrate that the WebQuest-based flipped classroom was more beneficial and efficient than the face-to-face classroom in improving learners' listening comprehension skills, both immediately and over the long term. This may be explained by how listening input was delivered in each method. In the face-to-face condition, guidance for listening tasks consisted primarily of printed materials presented by the instructor in class. In contrast, in the WebQuest-based classroom, input comprised web-based materials presented on the WebQuest platform. The authenticity of tasks—a prominent feature of WebQuests—likely motivated learners to engage actively in the learning process, a point supported by Termsinsawadi (2009). Another contributing factor may be the activation of higher-order thinking skills through authentic tasks and activities in WebQuest-based teaching, a finding consistent with Lee (2014). Additionally, the development of higher-level thinking skills may have further enhanced listening comprehension. Other advantages of the W ebQuest-based classroom over the face-to-face classroom included greater learner encouragement to learn, coverage of all content in a shorter time, and the creation of a more learner-centered course through diverse web-based resources that allowed independent study.

The qualitative findings of this study revealed that EFL learners held positive perceptions regarding the impact of the WebQuest-based classroom on their critical thinking and listening comprehension skills. Learner satisfaction and positive attitudes may be largely attributed to the learner-centered nature of the WebQuest-based flipped classroom, which allowed participants to view instructional videos and read resources as many times as needed to prepare for class. Additionally, out-of-class activities, inquiry-based tasks, and the specific use of formative assessment (i.e., giving and receiving feedback during the learning process) were other key characteristics distinguishing the WebQuest-based classroom from the face-to-face setting. These findings corroborate those of Aydin (2015), Hung (2015), March (2004), Gulbahar, Madran, and Kalelioglu (2010), and Zheng et al. (2008), all of whom reported positive learner attitudes and perceptions toward WebQuest instruction.

Furthermore, the present results are consistent with studies claiming that not only adult EFL learners but also students across all grade levels prefer WebQuest-based flipped instruction over traditional teaching methods (e.g., Abbit & Ophus, 2008; Termsinsawadi, 2009). When learners are highly engaged in authentic WebQuest activities and hold positive attitudes and perceptions, they actively involve themselves in exploring, discussing, questioning, and constructing learning processes and outcomes, which in turn further promotes their higher-order thinking skills. One possible explanation for these positive perceptions is that the structure of the WebQuest-based flipped classroom made the content (critical thinking and listening comprehension skills) more interesting for learners. Another possible reason is that learners' understanding was checked and assessed each session while they were engaged in cooperative activities. Additionally, these findings may be explained by learners' preferences for inquiry-based or technology-based activities.

CONCLUSION

The findings of the present study suggest that implementing a WebQuest-based flipped classroom can assist EFL teachers in enhancing learners' critical thinking and listening comprehension skills more effectively and efficiently, both in the short term and over an extended period. EFL teachers are encouraged to design WebQuests that provide learners with instructional videos, authentic and collaborative learning activities, as well as authentic assessment and constructivist learning experiences. Such an approach not only develops critical thinking and listening comprehension but also ensures that all learning materials are adequately covered within a reasonable timeframe. It is also incumbent upon EFL instructors to create a context within the WebQuest-based flipped classroom that encourages learners to think critically, solve problems, and construct personally meaningful knowledge, rather than imposing a prescriptive learning environment typical of traditional face-to-face classrooms. Furthermore, teachers are advised to offer sufficient scaffolding in the WebQuest-based flipped classroom while simultaneously encouraging learners to take greater responsibility for their own learning.

Therefore, EFL learners are recommended to autonomously navigate the instructional resources available in the WebQuest to develop their critical thinking and listening comprehension skills. The findings may also benefit learners with limited English proficiency, as they can work at their own pace and space to explore various resources within the WebQuest and engage more deeply with different aspects of critical thinking and listening comprehension. Moreover, EFL educators are urged to recognize the value of the WebQuest-based flipped classroom and understand how it contributes to the improvement of EFL learners' critical thinking and listening comprehension skills.

Nevertheless, certain limitations of the present study offer directions for future research. Although a small number of EFL learners (ten per class) were recruited due to limited participant availability and the demanding, time-consuming nature of listening comprehension tasks, the study still yielded accurate findings. Because the participants were initially weak in critical thinking, the results may not be generalizable to EFL or English as a second language (ESL) learners with stronger critical thinking abilities. Therefore, replication of this study with learners possessing moderate or high critical thinking skills is recommended to determine whether the same instructional procedures can enhance their critical thinking. Further replication with larger sample sizes over longer periods is also suggested to examine whether the WebQuest-based flipped classroom can raise weak critical thinkers' CCTST scores beyond the threshold of 12, which indicates fundamental weaknesses (Facione & Facione, 1993). Additionally, since all participants were at the same proficiency level, future research could involve larger samples or learners at different proficiency levels.

Finally, future studies could investigate the effects of WebQuests on other language skills alongside critical thinking, particularly reading comprehension, where the impact on learners' schematic and systemic knowledge could be explored.

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