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The Effect of Textually Enhanced Dual Subtitles on Vocabulary Learning and Listening Comprehension of Iranian EFL Learners

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Abstract

The present study was an attempt to investigate the effects of textually enhanced dual subtitles (TEDS) on vocabulary learning and listening comprehension among Iranian intermediate-level English language learners. The research explored how different types of subtitles—TEDS, plain dual subtitles (PDS), and no subtitles—impact learners' ability to learn vocabulary and influence their listening comprehension. To achieve this goal, 51 Iranian intermediate English as a foreign language (EFL) learners from a private Institute (i.e., Iran National Language Institute) were randomly assigned to three groups: The first experimental group, namely TEDS watched six episodes of the American sitcom *Friends* with TEDS; the second experimental group with PDS, and the control group without any subtitles. Before and after the treatment, all the participants took tests assessing their vocabulary knowledge and listening comprehension. The results revealed that, regarding vocabulary posttest, the participants exposed to TEDS performed significantly better than those who watched videos with PDS or no subtitles. However, the difference in listening comprehension scores between the TEDS group and the PDS group was not statistically significant. Additionally, the PDS group performed significantly better than the no-subtitles group in both vocabulary and listening comprehension tests. This research highlights the potential of TEDS in supporting vocabulary learning. The findings suggest that further exploration into different types of textual enhancement of various language elements and their effects on various language skills is necessary to improve instructional practices and enhance language learning tools.

***Keywords*:** Multimedia Learning, Textual Enhancement, Dual subtitles, Vocabulary learning, Listening comprehension

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INTRODUCTION

The integration of multimedia into second language (L2) instruction has increasingly influenced foreign language teaching. English as a Foreign Language (EFL) learners often face challenges in developing listening comprehension and acquiring vocabulary due to their limited exposure to authentic language input (Richards & Schmidt, 2002). The change toward a communicative teaching approach and using more authentic materials showed the need to use audiovisual resources more effectively (Gilmore, 2007; Seferoğlu, 2008). Video-based materials, particularly when supplemented with subtitles, can provide learners with rich multimodal input, combining auditory, visual, and textual information, which facilitates language acquisition (Garza, 1991; Mayer, 2001).

Subtitles have evolved from silent film intertitles to modern dual-language formats, which display text in both the learners' first language (L1) and L2 (Cintas, 2005; Zanon, 2006). Dual subtitles can enhance comprehension and support vocabulary learning, particularly for intermediate-level learners who may struggle to map meaning from spoken input alone (Vanderplank, 2016). Textual enhancement (TE), such as bolding or highlighting target words, draws learners' attention to key linguistic forms and can further facilitate noticing and retention (Simard, 2009; Smith, 1993).

Recent theoretical reviews question the assumption that subtitles are always beneficial for language learners. To (2024) provides a comprehensive analysis of research on L1 subtitles, L2 captions, and dual-language subtitles, framed within multimedia learning theory. Although some studies report positive effects on comprehension and vocabulary acquisition, To (2024) emphasizes that subtitle effectiveness varies significantly with learners' proficiency, the type of subtitling, and individual learner factors. Importantly, the review highlights the need to consider learner perspectives and cognitive processes, rather than treating subtitles as universally helpful. This nuanced view underscores the complexity of subtitle use in L2 learning and informs the rationale for investigating textually-enhanced dual subtitles in authentic

viewing contexts.

Despite the evidence supporting the benefits of subtitles and TE for vocabulary learning and listening comprehension (Dizon & Thanyawatpokin, 2021; Mahalingappa et al., 2023), research has rarely examined the combined effects of dual subtitles and TE in a single instructional condition, particularly in EFL contexts. Moreover, limited attention has been paid to how textually-enhanced dual subtitles (TEDS) influences both vocabulary learning and listening comprehension simultaneously among intermediate learners.

Therefore, the present study addresses this gap by investigating how TEDS influence vocabulary learning and listening comprehension among Iranian intermediate-level English learners while watching authentic L2 video content. Thus, the present study aims to answer the following research questions:

(1) Do textually-enhanced dual subtitles promote vocabulary learning more significantly than plain dual subtitles and no subtitles among Iranian EFL learners?

(2) Do textually-enhanced dual subtitles promote Iranian EFL learners' listening comprehension more significantly than plain dual subtitles or no subtitles?

The findings are expected to contribute to a more nuanced understanding of subtitle design and inform the development of effective audiovisual instructional practices in EFL settings.

LITERATURE REVIEW

Video Streaming

Language teaching and learning have long been intertwined with technology. Since early recording machines and phonographs used for pronunciation and listening (Kelly, 1969) to instructional radio broadcasts in the 1930s and educational films by Disney, multimedia has continually shaped language education. By the 1970s, videocassette recorders (VCRs) enabled teachers to incorporate videos into classrooms. The visual aspect of videos helps learners

understand through gestures and context as well (Talavan, 2007). The 1990s saw the rise of digital video, Digital Video Discs (DVDs), and networked sharing, expanding the reach of video-based pedagogy (Davies, 1991; Schneider & Bennion, 1984). With the growth of online platforms such as YouTube, learners now have access to authentic audiovisual materials that increase motivation and exposure to real-language contexts (Çakır, 2006; Gorjian, 2014; Qomariyah et al., 2021).

The advent of on-demand streaming, such as Netflix, has further facilitated access to foreign-language programs (Laghari et al., 2023). Initial studies highlight that streaming supports motivation, incidental vocabulary learning, listening comprehension and cultural knowledge acquisition (Alm, 2019; Damanik & Katemba, 2021; Dizon, 2018; Erarslan & Asmali, 2021; Meiing, 2007; Rahmatian & Armiun, 2011; Wang & Chen, 2019). Feng and Webb (2020) found that authentic video provides benefits for incidental vocabulary acquisition comparable to reading and listening. Peters and Webb (2018) demonstrated that longer viewing sessions enhance recognition and recall of vocabulary, reflecting more authentic learning behavior.

Subtitles, Captions and Textual Enhancement

Subtitles play a pivotal role in comprehension and vocabulary acquisition. L1 subtitles primarily enhance understanding of content, while L2 captions support vocabulary and grammar acquisition (Bianchi & Ciabattoni, 2008; Birulés-Muntané & Soto-Faraco, 2016; Lei, 2023; Masrai, 2019; Pujadas & Munoz, 2020). Alotaibi et al. (2023), in a meta-analysis of subtitle use in L2 classrooms, found a moderate to strong overall effect of subtitles on language learning outcomes, particularly on vocabulary acquisition and listening comprehension. Additionally, Chen (2025) found that bilingual subtitles produce the greatest immediate vocabulary gains among middle and high school learners, followed by L1 subtitles, compared with no subtitles. Subtitles may be verbatim, providing word-for-word transcription to aid noticing of spoken forms, or non-verbatim, condensing content to enhance clarity and comprehension (Caimi, 2006; Cordella, 2007; Meskill, 1996).

Non-verbatim formats allow learners to focus on key meaning without distraction from redundant speech, while verbatim subtitles are especially useful for noticing precise language forms.

Recent research emphasizes nuanced effects of subtitle type depending on proficiency, playback speed, and targeted skills (Mahalingappa et al., 2023; Yulia & Yazaki, 2023). Chen (2024) examined four subtitling conditions—no subtitle, intralingual subtitles, interlingual subtitles, and bilingual keyword subtitles—across diverse learner groups (primary, middle, and high school EFL learners). The results indicated that middle and high school students achieved higher scores on vocabulary meaning recall with subtitles compared to no subtitles and that bilingual keyword subtitles were most effective for middle school students, while interlingual subtitles were most beneficial for high school learners. In contrast, primary school participants did not show significant gains with any subtitle condition, suggesting that subtitle effectiveness varies with cognitive development and proficiency level. In addition to experimental findings on subtitle effects, recent pedagogical discussions emphasize the real-world relevance of subtitles in both formal and informal learning environments. Baranowska (2025) argued that subtitles have long been recognized as valuable in foreign language learning and that advances in streaming technology enable extensive out-of-class exposure, which can significantly enhance comprehension, vocabulary acquisition, and overall language development.

Dual subtitles provide exposure to both spoken and written forms, reinforcing form-meaning connections and promoting grammar and vocabulary learning, and comprehension of subject matter (Etemadi, 2012; Lee & Revesz, (2020); Lwo & Lin, 2012; Raine, 2013; Wang, 2019). Peters et al. (2016) and Zhang and Liu (2021) reported that repeated exposure to dual-subtitled input enhances vocabulary and listening skills. The choice between formats depends on learning objectives, proficiency level, and instructional goals, making careful selection critical for maximizing learning outcomes. Beyond the type of subtitles, the frequency of exposure also influences learning outcomes. Lo (2024) found that repeated viewings of

dual-subtitled videos, especially immediate repetition, significantly enhanced vocabulary acquisition among lower-intermediate EFL learners, highlighting the role of repeated engagement in vocabulary retention.

TE, through typographical manipulations such as bolding or underlining, highlights linguistic forms to promote noticing and intake (Khanzade & Rezvani, 2022; Schmidt, 1990; Smith, 1993). Although recent studies demonstrate TE's efficacy for vocabulary, grammar, collocation acquisition, and incidental idiom learning (Al-Shammari & Sahiouni, 2023; Jung & Lee, 2023; Jung et al., 2022; Lee & Révész, 2020; Luquin & García Mayo, 2023; Pam & Karimi, 2016), Yeldham (2023) suggests that the effectiveness of TE depends on learner proficiency, material complexity, and input type. Many researchers in the field supported the theoretical tenets of TE (Bishop, 2004; Ghaemi & Golshan, 2017; Jones & Waller, 2017; Kim, 2006; Sarkhosh et al., 2013). When combined with captions, TE strengthens learner attention, facilitating deeper engagement with L2 features and supporting L2 acquisition (Simard, 2009).

Vocabulary Learning and Listening Comprehension

Vocabulary acquisition is essential for effective communication and L2 proficiency. Traditional word-list approaches are limited, whereas multimedia and subtitled content enhance learning by engaging both visual and auditory channels (Gorjian et al., 2012; Kim & Gilman, 2008). Studies show that subtitles improve incidental vocabulary acquisition, lexical chunk learning, idioms, and collocations, especially when learners interact with authentic content (Baltova, 1999; Frumuselu et al., 2015; Lertola, 2010; Yuksel & Tanriverdi, 2009). The combination of bimodal or dual subtitles provides repeated exposure to form and meaning, promoting retention and comprehension.

Listening, a critical skill for communication, benefits significantly from audiovisual input. Subtitles allow learners to map auditory input to written text, reinforcing both listening and reading comprehension (Nunan, 2002; Rost, 1994; Vanderplank, 2010; Vilmantė Kiubinienė, 2009). Empirical

evidence indicates that captioned videos improve listening comprehension across proficiency levels, with L1 subtitles facilitating initial comprehension and L2 captions or dual subtitles fostering deeper language processing (Firdausi, 2024; Hayati & Mohmedi, 2011; Markham, 1989, 1993; Markham et al., 2001; Winke et al., 2010).

Recent research has shifted attention from general listening comprehension to more nuanced subskills of listening, such as the perception of connected speech. For example, Zhu and Hu (2024) examined the effects of watching subtitled videos on L1 Chinese–L2 English speakers' perception of English connected speech, including features like linking and deletion. Their results indicated that subtitled videos facilitated connected speech perception more than non-subtitled videos, and that this facilitation varied with learner proficiency and subtitle form. Specifically, higher-proficiency learners showed greater gains, and L1 subtitles were particularly helpful for processing complex connected speech structures. These findings suggest that the benefits of subtitles extend beyond basic comprehension to important aspects of fluent listening, supporting the idea that multimodal input can enhance advanced listening processes in L2 learning.

Instructional Use of Subtitles

Research confirms the effectiveness of subtitles in educational settings. Subtitled videos integrate auditory, visual, and contextual input, enhancing comprehension, vocabulary recognition, and retention (Choi & Johnson, 2005, 2007; Mackey & Ho, 2008; Yang et al., 2009). Bimodal and standard subtitles outperform reversed subtitles for vocabulary acquisition and comprehension (Mitterer & McQueen, 2009; Zanon, 2006; Zarei, 2009). Learner background and proficiency influence the impact: beginners benefit more from L1 subtitles, whereas advanced learners gain from L2 captions or reversed formats (Bianchi & Ciabattoni, 2008; Dunan, 2004; Vanderplank, 1990).

Despite their benefits, subtitles may present challenges, including cognitive overload, overreliance on reading, and distraction from auditory

input (Caimi, 2006; King, 2002; Moreno & Mayer, 2007; Taylor, 2005; Vandergrift, 2007; Zanon, 2006). Effective use depends on learner proficiency, subtitle type, playback speed, and instructional purpose, requiring careful pedagogical planning.

Contemporary research highlights the advantages of dual and textually enhanced subtitles for L2 learners. These tools support vocabulary acquisition, listening comprehension, and grammar learning, with effectiveness influenced by learner characteristics and instructional conditions. Subtitled videos thus constitute a vital resource in modern EFL instruction, providing authentic, multimodal input and fostering more comprehensive language development.

PURPOSE OF THE STUDY

While subtitles have been widely used to support language learning, the effects of combining dual subtitles with TE remain underexplored. Research suggests that L1 subtitles mainly improve content comprehension, whereas L2 captions aid vocabulary and grammar learning (Bianchi & Ciabattoni, 2008; Birulés-Muntané & Soto-Faraco, 2016; Lei, 2023). Dual subtitles offer exposure to both languages simultaneously, potentially reinforcing connections between spoken and written forms, but empirical evidence on their effectiveness is limited (Lwo & Lin, 2012; Raine, 2013). TE, such as bolding or highlighting target words, has been shown to direct learners' attention to important language features and improve retention (Al-Shammari & Sahiouni, 2023; Lee & Révész, 2020).

This study investigates the impact of TEDS on vocabulary learning and listening comprehension among Iranian intermediate EFL learners. It aims to determine whether integrating dual subtitles with typographical emphasis can enhance learners' understanding of spoken language and retention of new vocabulary. The results are intended to guide the development of effective audiovisual instructional materials and provide practical guidance for EFL teachers in similar contexts.

METHOD

Participants

The participants were 51 Iranian EFL learners (30 female and 21 male) enrolled in a private language institute. All of the participants were native speakers of Persian (Farsi) and ranged in age from 15 to 30. The majority of the participants were high school students. A small subset of the sample (n=5) consisted of undergraduate students from various academic majors such as computer science and management but there were no participants majoring in English. The participants were selected through convenience sampling from intact EFL classes; therefore, the sample itself was non-randomized. However, after participant selection, the learners were randomly assigned to experimental and control conditions. Thus, while randomization was applied at the assignment stage, it was not used in the sampling stage. Random assignment was used to minimize pre-existing group differences and enhance internal validity, while statistical controls (e.g., pretest scores) were applied to further reduce potential confounding effects. Learners' language proficiency was assessed using the Cambridge Placement Test, and only those at the B1 (intermediate) level based on the Common European Framework of Reference for Language (CEFR) were included. The participants were randomly assigned to three groups: The first experimental group, henceforth referred to as TEDS, watched six episodes of Friends with TEDS, the second experimental group, hereafter referred to as PDS, watched the same episodes with plain dual subtitles (PDS), and the control group (CG) watched the episodes without subtitles. Ethical considerations were observed throughout the study. All of the participants were informed of the purpose and procedures of the research prior to data collection. Written informed consent was obtained from all of the adult participants. For those under the age of 18, parental consent was obtained in addition to the learners' agreement. The participants were assured of the confidentiality and anonymity of their data and informed of their right to withdraw from the study at any stage without penalty.

Instrumentation

Several instruments were used for data collection. First, the Cambridge Placement Test was administered to ensure the participants' homogeneity in terms of language proficiency. The vocabulary pretest and posttest were researcher-developed and based on lexical items appearing in the target video episodes. Content validity was established through careful alignment between test items and the instructional input, as well as consultation with two experienced EFL instructors: One holding a Ph.D. degree in TEFL with 15 years of teaching experience and the other holding an M.A. degree in TEFL with 7 years of teaching experience. All vocabulary items were checked against the *Cambridge Dictionary* to ensure they were slightly above the learners' proficiency level (B2), thereby minimizing ceiling effects while remaining comprehensible. The vocabulary pretest consisted of 35 items, while the posttest included 25 items (e.g., apparently, mentally, imperial, hasty, ridiculous, etc.) The reduction in item count was intentional: Items that were correctly answered by a large majority of the participants on the pretest were removed from the posttest to improve sensitivity to instructional effects and reduce redundancy. Although the vocabulary pretest and posttest targeted overlapping lexical items, this overlap was deliberate and aligned with the instructional content. To reduce potential score inflation due to test familiarity, a substantial time interval separated test administrations, the number of items was reduced in the posttest, and Analysis of covariance (ANCOVA) analyses were conducted using pretest scores as covariates. This analytic approach statistically controlled for initial differences. To minimize construct-irrelevant variance, the posttest required learners to provide either an L1 equivalent or an English definition, ensuring that productive language ability did not confound measurement of receptive vocabulary knowledge. Internal consistency reliability was acceptable for both administrations.

Listening comprehension was assessed using researcher-developed true-false tests based on the global and detailed content of the video episodes. Separate episodes from the same television series were used for the pretest

and posttest, each consisting of 15 true-false questions, to control for topic familiarity while maintaining comparable difficulty. Test items closely mirrored the linguistic structures and discourse patterns of the videos, supporting content validity. The Sample pretest items included:

(1) Rachel hates the singing guy because he interrupts her sleep in the middle of the night.
(2) Monica is tired of Rachel's bellyaching and thinks the boys' apartment is a nice place for them to live.
(3) Ross pierced his ear because he always wanted to be like David Bowie.

The following are sample posttest items:

(1) The housekeeper gave Phoebe the phone number of where they were at rehearsal.
(2) Mrs. Geller has high hopes for Monica getting married.
(3) Mr. Waltham thinks his wife is so selfish that he should not have married her.

Reliability analyses was calculated using Cronbach's alpha. The listening comprehension pretest and posttest indicated satisfactory internal consistency with values around 0.91.

Data Collection Procedure

This study adopted a quasi-experimental design to investigate the effects of subtitle type on vocabulary learning and listening comprehension among Iranian EFL learners. The independent variable was subtitle condition with three levels: (a) TEDS, (b) PDS without TE, and (c) no subtitles. The dependent variables were learners' vocabulary learning and listening comprehension.

The participants were randomly assigned to three groups: two experimental groups, one of which watched the episodes with TEDSTEDS and the other watched the same episodes with PDS, and one CG which watched the same episodes with no subtitles. For the TEDS group, selected target vocabulary items were visually enhanced in the English subtitles

through underlining and highlighting to increase salience. For example, when the character used the word "marriage," the phrase appeared highlighted in the English and Persian subtitles. Across episodes, the same enhancement format was applied consistently to all target items. The PDS group watched the same episodes with PDS, in which English and Persian subtitles were displayed simultaneously but without any visual enhancement. Aside from subtitle format, instructional conditions—including viewing time, episode sequence, and teacher involvement—were identical for both experimental groups and the CG.

The study was conducted over six instructional sessions. Before the treatment, all of the participants completed the placement test, the vocabulary pretest, and the listening comprehension pretest. During the treatment phase, each group watched six episodes of the American sitcom Friends (Season 4, Episodes 19–24) in a classroom setting under controlled classroom conditions; the only difference between groups was the subtitle format. The "*Subtitle Edit"* software was used to synchronize English and Persian subtitles and to apply TE to target vocabulary items in the experimental condition. Preselected lexical items in the subtitles were highlighted and underlined to increase their visual salience while maintaining the original subtitle content. The enhanced items consisted of lexical words (verbs, nouns, adjectives, and adverbs) that were considered slightly above the learners' proficiency level (B2 level), as verified using the *Cambridge Dictionary*. A total of 35 target vocabulary items were initially selected from the six video episodes based on frequency of occurrence, contextual relevance, and instructional value. Items that were already familiar to most learners, as indicated by pretest performance, were excluded from the posttest, resulting in 25 target items for analysis. The same enhancement format and selection criteria were applied consistently across all the episodes to ensure uniform exposure. The number of enhanced items per episode ranged from three to eight, and each target item appeared at least twice within meaningful contexts.

At the beginning of the first session, the learners received a brief explanation of the storyline, characters, and viewing expectations. The

instructor (the second researcher of the present study) then adopted a passive role, playing the episodes without providing additional instruction or intervention. After the completion of all viewing sessions, the participants took the vocabulary and listening comprehension posttests. Although the vocabulary pretest and posttest included overlapping items, the time interval between administrations and the reduction of items minimized any potential test-recall effects.

Data Analysis

The collected data were analyzed using the Statistical Package for Social Sciences (SPSS). Descriptive statistics, including means and standard deviations, were calculated for all three groups. To examine differences in vocabulary learning and listening comprehension gains, two separate ANCOVA analyses were conducted, with pretest scores serving as covariates. Post-hoc comparisons using the Tukey HSD test were performed to identify significant differences between group pairs.

RESULTS

Vocabulary learning (Investigating Research Question 1)

A one-way ANCOVA was conducted to examine the effect of TEDS on vocabulary learning among intermediate Iranian EFL learners. Descriptive statistics for the three groups' posttest scores are presented in Table 1.

All assumptions for ANCOVA were checked and satisfied. Normality, linearity between the pretest and posttest scores, independence of the covariate, homogeneity of regression slopes, and homogeneity of variances were all confirmed.

Table 1. Descriptive statistics for the three groups in the vocabulary posttest

				Statistic	**Std. Error**
groups	TEDS	Mean		91.52941	1.450450
		95% Confidence Interval for Mean	Lower Bound	88.45459	
			Upper Bound	94.60423	
		Median		92.00000	
		Variance		35.765	
		Std. Deviation		5.980360	
		Minimum		80.000	
		Maximum		100.000	
		Range		20.000	
		Skewness		-.156	.550
	PDS	Mean		77.41176	1.411765
		95% Confidence Interval for Mean	Lower Bound	74.41896	
			Upper Bound	80.40457	
		Median		76.00000	
		Variance		33.882	
		Std. Deviation		5.820855	
		Minimum		68.000	
		Maximum		88.000	
		Range		20.000	
		Skewness		-.014	.550
	CG	Mean		33.41176	1.411765
		95% Confidence Interval for Mean	Lower Bound	30.41896	
			Upper Bound	36.40457	
		Median		32.00000	
		Variance		33.882	
		Std. Deviation		5.820855	
		Minimum		24.000	
		Maximum		44.000	
		Range		20.000	
		Skewness		-.014	.550

The ANCOVA results (Table 2) revealed a significant effect of subtitle type on vocabulary learning after controlling for pretest scores (covariate), with a partial eta squared (Partial η^2) of 0.990, indicating a very strong effect.

Table 2. Tests of Between-Subjects Effects

Dependent Variable: posttest						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared (Partial η^2)
Corrected Model	32592.394[a]	3	10864.131	1678.361	< 0.001	0.991
Intercept	71357.184	1	71357.184	11023.715	< 0.001	0.996
groups	31616.760	2	15808.380	2442.180	< 0.001	0.990
pretest	1352.237	1	1352.237	208.902	< 0.001	0.816
Error	304.234	47	6.473			
Total	264928.000	51				
Corrected Total	32896.627	50				
a. R Squared = 0.991 (Adjusted R Squared = 0.990)						

Post hoc Tukey HSD tests (Table 3) showed significant differences between all groups. The TEDS group outperformed the PDS group and the CG, while the results for PDS group were also significantly better than the results for CG. These findings suggest that TEDS substantially enhance vocabulary learning, with PDS offering moderate improvement over no subtitles.

Table 3. Multiple Comparisons

Tukey HSD						
(I) groups	**(J) groups**	**Mean Difference(I-J)**	**Std. Error**	**Sig.**	**95% Confidence Interval**	
					Lower Bound	**Upper Bound**
TEDS	**PDS**	14.117647*	2.014938	< 0.001	9.24454	18.99075
	CG	58.117647*	2.014938	< 0.001	53.24454	62.99075
PDS	**TEDS**	-14.117647*	2.014938	< 0.001	-18.99075	-9.24454
	CG	44.000000*	2.014938	< 0.001	39.12690	48.87310
CG	**TEDS**	-58.117647*	2.014938	< 0.001	-62.99075	-53.24454
	PDS	-44.000000*	2.014938	< 0.001	-48.87310	-39.12690
*. The mean difference is significant at the 0.05 level.						

Listening Comprehension (Investigating Research Question 2)

A one-way ANCOVA was conducted to investigate the effect of TEDS on listening comprehension. Descriptive statistics for the three groups' posttest scores are provided in Table 4.

Table 4. Descriptive statistics for all groups in the listening comprehension posttest

				Statistic	**Std. Error**
groups	TEDS	Mean		83.23529	2.447282
		95% Confidence Interval for Mean	Lower Bound	78.04729	
			Upper Bound	88.42330	
		Median		80.00000	
		Variance		101.816	
		Std. Deviation		10.090400	
		Minimum		66.000	
		Maximum		100.000	
		Range		34.000	
		Skewness		0.189	0.550
	PDS	Mean		76.11765	2.553663
		95% Confidence Interval for Mean	Lower Bound	70.70412	
			Upper Bound	81.53117	
		Median		73.00000	
		Variance		110.860	
		Std. Deviation		10.529022	
		Minimum		60.000	
		Maximum		93.000	
		Range		33.000	
		Skewness		0.066	0.550
	CG	Mean		65.58824	2.540928
		95% Confidence Interval for Mean	Lower Bound	60.20171	
			Upper Bound	70.97476	
		Median		66.00000	
		Variance		109.757	
		Std. Deviation		10.476514	
		Minimum		53.000	
		Maximum		86.000	
		Range		33.000	
		Skewness		0.433	0.550

All ANCOVA assumptions were met, including normality, linearity, independence of the covariate, homogeneity of regression slopes, and equality of error variances. The ANCOVA results (Table 5) demonstrated a significant effect of subtitle type on listening comprehension after controlling for pretest scores, with a partial eta squared (Partial η^2) of 0.722, indicating a strong effect.

Table 5. Tests of Between-Subjects Effects

Dependent Variable: posttest						
Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**	**Partial Eta Squared** (Partial η^2)
Corrected Model	6799.055[a]	3	2266.352	102.429	< 0.001	0.867
Intercept	1035.643	1	1035.643	46.806	< 0.001	0.499
groups	2694.434	2	1347.217	60.888	< 0.001	0.722
pretest	4119.015	1	4119.015	186.161	< 0.001	0.798
Error	1039.926	47	22.126			
Total	294564.000	51				
Corrected Total	7838.980	50				
a. R Squared = .867 (Adjusted R Squared = .859)						

Post hoc Tukey HSD tests (Table 6) showed that the TEDS group scored higher than both PDS group and CG, while the PDS group also outperformed the CG. However, the difference between the TEDS and PDS groups was relatively small, indicating that PDS are nearly as effective for listening comprehension in intermediate English-as-a-second-language learners.

Table 6. Multiple Comparisons

Tukey HSD						
					95% Confidence Interval	
(I) groups	**(J) groups**	**Mean Difference (I-J)**	**Std. Error**	**Sig.**	**Lower Bound**	**Upper Bound**
TEDS	**PDS**	7.11765	3.555905	0.123	-1.48227	15.71756
	CG	17.64706*	3.555905	< 0.001	9.04715	26.24697
PDS	**TEDS**	-7.11765	3.555905	0.123	-15.71756	1.48227
	CG	10.52941*	3.555905	0.013	1.92950	19.12933
CG	**TEDS**	-17.64706*	3.555905	< 0.001	-26.24697	-9.04715
	PDS	-10.52941*	3.555905	0.013	-19.12933	-1.92950
Based on observed means.						
The error term is Mean Square (Error) = 107.478.						
*. The mean difference is significant at the 0.05 level.						

Overall, the results indicate that dual subtitles improve both vocabulary learning and listening comprehension. TEDS provide the greatest benefit, followed by PDS, with no subtitles resulting in the lowest scores.

DISCUSSION

This study examined the effects of TEDS on vocabulary learning and listening comprehension among Iranian intermediate EFL learners. The

results showed that learners exposed to TEDS outperformed those using PDS or no subtitles, particularly in vocabulary learning. Although both subtitle groups, TEDS and PDS, achieved higher listening comprehension scores than the CG, the difference between TEDS and PDS was not statistically significant.

The vocabulary findings support Schmidt's (1990) Noticing Hypothesis, indicating that TE increases the salience of target words and facilitates learning. From a cognitive perspective, Cognitive Load Theory (Sweller, 1994) and multimodal learning principles (Mayer & Moreno, 2003) explain how dual subtitles reduce extraneous cognitive load by integrating auditory and visual input, leading to deeper processing and retention. These results are also consistent with Connectionist theory (Ellis, 1998), which emphasizes the role of repeated, contextualized exposure in strengthening form–meaning connections.

The present findings are also consistent with broader evidence reported in recent meta-analytic research (Alotaibi et al, 2023), demonstrating a moderate to strong overall effect of subtitles on language learning outcomes, particularly vocabulary acquisition and listening comprehension. The current results, showing clear advantages for both textually-enhanced and PDS over no subtitles—and a stronger effect for vocabulary than listening—align with their conclusion that subtitles are most effective for form-focused learning while supporting listening comprehension to a lesser but still meaningful extent.

The present findings also align with longitudinal evidence showing that subtitle format influences both vocabulary acquisition and retention. In a recent study, it was demonstrated that bilingual subtitles produced the greatest immediate vocabulary gains among middle and high school learners, followed by L1 subtitles (Chen, 2025). Additionally, learners who viewed PDS outperformed the no-subtitle group, which aligns with Krashen's (1985) Input Hypothesis, which declares language acquisition occurs through exposure to comprehensible input. In line with this principle, learners who viewed PDS in the present study may have benefited from repeated,

comprehensible input, facilitating vocabulary acquisition and listening comprehension. This observation also aligns with recent empirical evidence showing that repeated exposure to dual-subtitled input enhances vocabulary and listening skills (Peters et al., 2016; Zhang & Liu, 2021).

The minimal difference in listening comprehension among groups suggests that TE is more effective for discrete vocabulary retention than for complex auditory comprehension. From a theoretical perspective, Connectionist theory (Rumelhart & McClelland, 1986) suggests that repeated, focused exposure strengthens specific neural connections. In the present study, TE may have reinforced lexical associations through repeated exposure, thereby facilitating vocabulary retention more than broader listening comprehension. Additionally, Krashen's (1982) Affective Filter Hypothesis indicates that reducing learner anxiety can enhance language acquisition. The increased salience and clarity provided by TE might have lowered learners' affective barriers, indirectly supporting comprehension, although the effect appears limited for complex listening tasks.

It is important to note that some studies report mixed effects of TE on listening. For example, Lee and Révész (2020) showed that TE directs learners' attention to target forms and structures, improving retention, though it may distract learners from auditory input. These findings may be justified by the way learners distribute attention across audio and text while watching subtitled videos (Yeldham, 2023). They indicate that the effectiveness of TE for listening comprehension depends on the proficiency level, material complexity, and the type of input provided.

Overall, the study confirms that dual subtitles, particularly with TE, are highly beneficial for vocabulary acquisition, and they provide moderate benefits for listening comprehension. These results support the use of audiovisual materials in language instruction, emphasizing that subtitle design should be tailored to learners' proficiency and instructional goals.

CONCLUSION AND IMPLICATIONS

This study examined the effects of TEDS, PDS, and no subtitles on

vocabulary learning and listening comprehension among Iranian intermediate (B1) English learners. The participants watched six episodes of *Friends* and completed pretests and posttests.

Learners exposed to TEDS achieved the highest gains in vocabulary and listening comprehension. Highlighting target vocabulary increased salience, supporting the Noticing Hypothesis (Schmidt, 1990), and facilitated connections between spoken and written forms, in line with multimodal learning (Mayer, 2001) and connectionist theory (Ellis, 1998). Recent studies (Lee & Révész, 2020) similarly show that TE directs attention to critical language items, enhancing vocabulary acquisition.

PDS also improved outcomes compared to no subtitles, providing simultaneous L1–L2 input that reinforced comprehension and vocabulary recognition. However, without TE, they were less effective for targeted vocabulary retention. The no-subtitle group performed lowest, highlighting the importance of visual support for intermediate learners, as suggested by Cognitive Load Theory (Sweller, 1994).

In summary, TEDS are most effective for vocabulary learning, while PDS still offer meaningful support for comprehension. Subtitle design should consider learners' proficiency and instructional goals to maximize learning outcomes.

Limitations of the study include the relatively small, non-randomized sample, uneven gender distribution, and limited treatment sessions, which may affect generalizability. Future research could examine the long-term effects of enhanced subtitles on retention and comprehension, as well as the impact of repeated exposure over time. Studies might also investigate their effectiveness across different proficiency levels, to determine whether TE supports basic vocabulary acquisition, complex grammar, or idiomatic expressions differently. Additionally, research could explore various settings, such as public schools, online platforms, or self-study environments.

The findings suggest that TEDS can be an effective instructional and design tool for supporting vocabulary learning and, to a lesser extent, listening comprehension, particularly for intermediate L2 learners. For

classroom practice, teachers can incorporate authentic video materials with selectively enhanced key vocabulary to increase salience, support noticing, and reduce processing difficulty, while gradually decreasing textual support as learners become more proficient to avoid overreliance on subtitles. Such an approach allows for differentiated instruction and encourages learner autonomy through guided in-class activities and independent out-of-class viewing. For materials developers, the results highlight the importance of designing multimedia resources that integrate audio, visual, and textual input in a balanced way, using restrained and purposeful TE to manage cognitive load. Interactive, adaptive, and accessible subtitle features can further enhance learning by accommodating diverse proficiency levels and learner needs. Together, these implications emphasize the value of principled subtitle design and pedagogical flexibility in multimedia-assisted language learning.

Disclosure statement

No potential conflict of interest was reported by the authors.

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