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What is the Effect of Input Mode on EFL Learners' Incidental Vocabulary Learning?

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ABSTRACT

Vocabulary learning constitutes an essential component of language learning and teaching. The type of input students receive is one of the factors that affect the pace and range of this learning. In the incidental vocabulary learning process, learners have been shown to benefit from exposure to a variety of input types to varying degrees. In this study, we examine the effects of three different input modes on learners' incidental vocabulary acquisition in a classroom setting. One hundred 5th-grade students in a state school in Turkey were assigned to one of the three experimental groups (reading, viewing, and viewing with the transcript) or a no-treatment control group. Learner gains were measured using a pretest, posttest, and delayed posttest design. Based on the results of the study, reading and viewing the transcript produced the same level of incidental vocabulary learning, while viewing alone did not yield significant results.

INTRODUCTION

Vocabulary knowledge is integral to mastering a language because of its interconnected nature with other components and skills within a language. Based on previous research, it has been estimated that the number of word families required to be able to handle spoken discourse in English is between 6,000 and 7,000, and between 8,000 and 9,000 for written discourse (Nation, 2006). Other more recent studies (e.g., Van Zeeland & Schmitt, 2013) have also indicated that the most frequent 3,000-word families may also be sufficient for comprehension of spoken discourse; however, it is challenging for learners to master the minimum number of word families in the EFL setting (Webb & Chang, 2012). The importance of vocabulary knowledge in language learning and teaching has long prompted scholars to explore techniques to expand and deepen learners' vocabulary. While vocabulary might be learned deliberately or intentionally, learning might also occur incidentally (Loewen, 2015). Since teaching all the words learners need to know is difficult in a classroom setting alone (Webb & Nation, 2017), there has been a growing interest in L2 incidental vocabulary learning, especially in recent decades (Webb et al., 2023).

Incidental vocabulary learning, which occurs "without the learner intending for it" is the most vital of vocabulary learning (Loewen & Reinders, 2011, p. 88). Such learning can take place through a variety of channels, including television (Peters & Webb, 2018), music (Pavia et al.,

2019), movies (Yuksel & Tanriverdi, 2009), and computer games (Peters, 2019). Since such means of learning appeal to the listening and viewing senses of the learners, a majority of research has been focused on the effects of audio or audiovisual materials in incidental vocabulary learning (Rodgers & Webb, 2011). Yet, reading is another way of learning words incidentally, which has been studied extensively (e.g., Feng & Webb, 2020; Pellicer-Sanchez & Schmitt, 2010).

Several studies have also used a multidimensional approach to incidental vocabulary learning, based on the differential effects of input types, to compare, for example, reading only and reading while listening (Teng, 2018) or reading, listening, and reading while listening (Webb & Chang, 2022). Relatively little research has compared reading with other modes of input, and the findings have been mixed. While one study examining the incidental learning of single words compared multiword items under listening and reading conditions found that reading was associated with greater gains for single words (Vidal, 2011) another study showed that learners in the reading-while-listening condition had greater gains in incidental vocabulary learning than those in the reading condition (Teng, 2018). Yet another study compared the effects of reading the printed transcript of a documentary, listening only, and viewing only condition and found that they all were equally effective (Feng & Webb, 2020). Although these studies examined the effects of different modes of input on incidental vocabulary learning, studies are yet to compare how reading the transcript along with the audiovisual input would differ from reading and watching only in terms of learner gains in incidental vocabulary acquisition. Besides, a majority of studies were conducted with tertiary-level language learners (but see, Neuman & Koskinen, 1992), and thus, there seems to be an additional need for studies to be conducted with learners in lower grade levels. The purpose of this study, therefore, is to address the gap in the literature by exploring the impact of written, audiovisual, and audiovisual with written input on incidental vocabulary learning by Turkish secondary school learners of English as a foreign language (EFL).

BACKGROUND

Incidental Vocabulary Learning

The acquisition of vocabulary in a first language (L1) first takes place incidentally in daily life before children are exposed to word units in a school setting. Incidental Vocabulary Learning (IVL) was first discussed in L1 vocabulary acquisition. In their experimental study, Nagy et al. (1985) confirmed the IVL hypothesis which envisioned that L1 words could be gained incidentally by reading a text and that it was an effective way to grow L1 vocabulary. Similar findings were confirmed by Day et al. (1991) for L2 EFL learners. Krashen (1989), in his pioneering work, proposed that a majority of word learning occurs incidentally without consulting a dictionary, usually while being engaged in a different activity such as reading. Similarly, in regard to the input hypothesis, he stated that exposure to comprehensible input yields effective and incidental acquisition of vocabulary. This, in fact, was later supported by research revealing that vocabulary learning involves more than memorization and entails a more complex cognitive process (Rott, 2012).

Although incidental vocabulary learning has been extensively investigated, there is still a lack of consensus regarding its definitions. Webb (2019) indicated two major definitions of IVL in the literature: those that are situated in psychological literature and those related to applied linguistics. Hulstijn defined incidental vocabulary learning as regards “the prelearning instructions that either do or do not forewarn subjects about the existence of a subsequent retention test” (Hulstijn, 2001; also see Eysenck, 1982). He further states that for grammar learning, no

incidental-intentional learning dichotomy is needed, but for vocabulary learning a distinction could be made due to the lack of "deliberate retention techniques" in incidental learning of vocabulary. According to him, both forms of learning involve "attention and noticing," but "the involvement of attention is not deliberately geared toward an articulated learning goal in the case of incidental learning" (Hulstijn, 2001, p. 361).

Most definitions within applied linguistics emphasize incidental vocabulary learning as a "by-product of" any activity that focuses on meaning such as reading, listening, and viewing without the intention to learn or teach vocabulary (Chen & Truscott, 2010; Loewen, 2015). Webb (2019) further evaluates this meaning of IVL with respect to "degrees of intention" by giving several possible learning conditions such as reading a text at home with a dictionary and reading the same text in the classroom. He states that whether incidental learning of words occurs or not depends on a learner's intention of what to do with the input rather than the context. In either case, if the learner has the intention to improve the language in doing an activity, it seems difficult to claim that the learning with not deliberate. Webb et al. (2023) also underscore that defining incidental learning as a form of learning without intention in some literature is somewhat questionable, as the intensity or willingness to learn can vary significantly between or even within individuals in various circumstances. Therefore, Webb (2019) maintains that IVL as a by-product of meaning-focused activities makes more sense as an explanation of the term within a pedagogical approach. According to him, "from a teaching and learning perspective, it is the purpose of the activity that carries weight rather than where intention and attention is placed during the activity," and therefore, regardless of the degrees of intention and attention or noticing, "any meaning-focused tasks" learners carry out "for the purpose of interest, information, and enjoyment will facilitate incidental word learning. In this vein, "the inclusion of glosses, textual enhancement, the context of learning (classroom vs. at home), and the availability of dictionaries" are all acceptable within the definition of IVL. On the other hand, "word-focused activities" with the objective of learning vocabulary through "exercises such as cloze, matching, sentence production, and flash cards" do not constitute incidental vocabulary learning. He, therefore, suggests that researchers follow Nation's (2007) description of learning in four layers to avoid confusion. Specifically, two of those layers are devoted to "meaning-focused" and "language-focused" learning with a "more transparent" way to explain incidental vocabulary learning (Webb, 2019, p. 226).

Incidental Vocabulary Learning: The Effect of Input Type

Incidental learning has been an attractive topic for many researchers who are interested in cognitive processes and learning. IVL occurs when the learners focus on the activity to be done but not on vocabulary learning or while doing another activity just for enjoyment such as listening to a song in L2, playing games, watching TV programs, movies, videos, or just reading in L2. The early studies started with reading which facilitates incidental learning by using context clues or encountering the vocabulary in the text. Using 20 Spanish EFL university students, Pellicer-Sanchez and Schmitt (2010) examined incidental vocabulary acquisition from an authentic novel. The study showed that learners had gained vocabulary from the novel by guessing the words when their proficiency level was enough high to guess a word in the text. Similarly, Macis (2018) conducted a case study on incidental learning with three female Ph.D. students at a British university by having them read a novel. In this study, guessing the meaning of unknown words from the context was shown to be an effective way. Although the beneficial effects of (extensive) reading in increasing the size and depth of vocabulary learned incidentally has been established

(see Restrepo Ramos, 2015), studies comparing different input modes are needed since multimodal studies are relatively fewer (Webb, 2019).

Vidal (2011) compared the effects of reading and listening on the learning and retention of incidental vocabulary. Two hundred and forty-eight freshmen learning English were assigned to one of the three experimental conditions: reading (authentic texts on tourism), listening (to authentic lectures about tourism), and control (no treatment). According to the results, subjects who read acquired more vocabulary and retained it more effectively than those who listened. This suggests that reading is a more effective method of acquiring vocabulary indicating that reading is a more effective means of learning vocabulary, although learners with higher proficiency scores in listening showed greater retention in the listening condition than those in the reading condition.

In a similar study comparing the effects of reading and reading while listening, Teng (2018) examined the incidental vocabulary gains by 60 university-level EFL learners in China. He looked at learning rate from four different dimensions which involve recognition of form, grammar, collocation, and recall of meaning. Frequency was another variable being investigated. The results revealed that IVL took place in both input modes, but learners were shown to learn more vocabulary while they were reading and listening at the same time. However, for effective incidental vocabulary learning, being highly exposed to words and intensive word processing were required. Similarly, Webb and Chang (2022) investigated incidental learning of collocations and compared learner gains in reading, listening, and reading while listening groups. It is important to note that in terms of incidental vocabulary learning, learners in all three groups made significantly greater gains than those in the control group. However, learners in the group that read while listening made the greatest gains.

Audiovisual input is another effective way to learn vocabulary incidentally (Puimège & Peters, 2020). Thanks to the advancements in technology, a great number of resources in foreign languages, especially in English, are accessible to language learners. As a consequence, increased exposure to audiovisual input outside the classroom enhances the learning of vocabulary incidentally. TV programs, documentaries, movies, series, and educational or short authentic videos may be counted as examples of audiovisual input. Given their effect on learning, the use of such materials has also been popular in materials used in the language learning classroom. Coursebook designers or various websites and media platforms that support language learning also include audiovisual components that should be integrated into classroom teaching and learning effectively. A study by Peters et al. (2019) showed that learners spend a greater amount of their time viewing television than reading in L2 English probably because it is more convenient and more entertaining. In a similar vein, Webb and Rodgers (2009) indicated that viewing television requires a minimum of 3,000 word families for vocabulary learning to take place, which could be an additional reason for it to be preferred by learners.

There are also theoretical underpinnings to the use of audiovisual input. There are a number of theories emphasizing the importance of audiovisual input for learning, including the Dual Coding Theory, which asserts that the human brain perceives information through two coding systems, namely, verbal and visual. A verbal system is related to the process in which things are coded verbally to human cognition and nonverbally as an image. Therefore, the usage of both systems is much more effective for learning to occur. It implies that presenting vocabulary to learners in a variety of ways can aid in improving vocabulary acquisition as it stimulates both verbal and nonverbal connections (Sadoski & Paivio, 2013). Multimedia Learning Theory is another cognitive scheme that is usually applied to learning vocabulary learning. It is mainly based on the idea that the human brain has different channels in the memory for the reception and

processing of oral and visual input (Mayer, 2009). It resembles Dual Coding Theory in that the more sense is used to learn or to get information the more people learn incidentally or intentionally. Both theories propose the idea that when learners process information both visually and verbally, they are more likely to retain the target items than if they only process them through one of the channels. On the other hand, other factors such as the frequency of occurrence of vocabulary and prior vocabulary knowledge should also be considered.

Various studies have confirmed that viewing television or videos helps learners acquire vocabulary incidentally (e.g., Peters & Webb, 2018; Webb & Rodgers, 2009) although there are various text- or learner-related factors that should be considered. Researchers examined the effects of viewing in a variety of multimodal ways. Peters (2019) investigated the influence of screen picture and screen text on word learning via audiovisual input using 142 Dutch EFL learners from a secondary school. The findings showed that learning occurred in all types, but the most effective mode of input was on-screen imagery. Yuksel and Tanriverdi (2009) carried out a study with secondary school students in Turkey using short movie clips with and without captions. Although the group watching the movie clip with captions improved a little better, no significant differences were noted. The role of audiovisual input in incidental vocabulary learning has also been examined by comparing it with other methods of input. Neuman and Koskinen (1992) investigated the effects of reading, as opposed to viewing, on incidental vocabulary learning. Short television segments were either watched (with and without captions) or read by children. The findings revealed that children in both modes of viewing made more gains than those in the reading condition, although no statistical significance for the difference between the viewing-only and reading conditions was reported. One study by Feng (2017) examined the effects of five different input modes on IVL. A total of 173 Chinese EFL learners studying at university either (a) read the transcript of a full-length TV documentary, (b) only listened to it, (c) viewed the video with captions, (d) viewed the silent video with captions, and (e) viewed the videos without captions. Although all groups made more progress than the control group in terms of learner gains in incidental vocabulary acquisition, no significant differences were found among the five intervention groups. This is an important pedagogical finding because it encourages teachers and learners to benefit from a variety of input modes (Feng, 2017). Feng and Webb (2020) investigated the effects of listening, watching, and reading on IVL with 76 Chinese EFL learners. The participants watched a documentary, listened to the audio recording without the picture, or read its transcript. Findings showed that all three types of input had the same effect on incidental learning of vocabulary.

Studies on IVL have established that it can be an effective way for learning new vocabulary. More recent research focuses on the effects of various input-related or learner-related factors on incidental learning of word units (e.g., Feng & Webb, 2020; Teng, 2018; Webb & Chang, 2022). Although various combinations of input modes have been investigated, studies examining the differential effects of input presented in written, audiovisual, and a combination of both have been limited. More studies that should tap into the role of input modes in incidental vocabulary learning are needed to exacerbate the findings because more research is needed to look at "a wider variety of participant profiles (e.g., young learners)" to be able to make more robust, generalizable claims (Webb, 2019, p. 137; Webb et al., 2023). The purpose of this study, therefore, is to fill this gap in the literature by exploring the effects of reading (written), viewing (audiovisual), and viewing with the transcript (audiovisual + written) on incidental vocabulary learning by Turkish middle school learners of English as a foreign language (EFL) by attempting to answer the following research questions:

1. To what extent does incidental vocabulary learning occur while (a) reading the printed transcript of a video without viewing, b) viewing the video without any transcript, and c) viewing the video with its transcript?

2. What are the differential effects of written, audiovisual, and audiovisual with written input on incidental vocabulary learning and retention?

METHODOLOGY

Design

This study adopts an interventionist quasi-experimental design which involves a pretest, a posttest, and a delayed posttest conducted on three intact classes to see the effects of input type on the incidental learning of vocabulary. Such pretest-posttest non-randomized control-group design "is widely used in language learning research because in real-life language classrooms it is not easy to reshuffle students randomly" (Phakiti, 2014, p. 72). The ethical approval for this study was obtained from Kutahya Dumlupinar University Ethics Committee (2022/06) and the Ministry of National Education Ethics Committee (E-53490996-44-65665275) in Turkey.

Participants

The participants of the study were 100 fifth-grade secondary school students learning English as a foreign language in Turkey (age range 11-12). They were enrolled in a compulsory English course held 3 class periods (40 mins. each) a week. Their proficiency level was estimated to be between beginner to low intermediate since they had been studying English for only two class periods a week until the fifth grade. To determine their passive vocabulary knowledge, students were administered the Turkish version of the Vocabulary Size Test (VST, Nation & Beglar, 2007) developed by Aksu Balamur (2019), and they had an average raw score of about 53.82 out of 90. Students from four intact classrooms were assigned to one of the three experimental groups and a no-treatment group through cluster random sampling, which will be further elaborated in the sections to follow. The study excluded data from 13 participants who missed a treatment or testing session, which resulted in 100 students completing all the steps involved in the intervention.

Instruments and Materials

The first data collection instrument used in the study was the adapted version of the VST (Nation & Beglar, 2007) for Turkish learners of English. Aksu Balamur (2019) adapted the VST by translating the choices of the multiple-choice questions. The low-frequency words were spread throughout the test so that the test-takers would be less likely to give up the test at the lower level.

The short video used in the study was selected in light of the participants' theme-based English lessons in the curriculum as determined by the Ministry of National Education (MoNe). The theme of the week "Fitness" and the related vocabulary were found to be relevant to the value education specified in the English Language Class Curriculum of MoNE (p. 5). Thus, the short educational video (Brydis' Story) was selected from the British Council website "learnenglishkids.britishcouncil.org" (Appendix X). The transcript of the video was checked by the researchers for its correspondence with what was uttered in the video.

Participants also took a multiple-choice test which was employed as a pretest, posttest, and delayed posttest. The test was a meaning recognition test measuring learners' ability to recognize the meaning of the target word (English) by selecting the correct answer among four options (Turkish) in a multiple-choice format. There were four options which included three Turkish words/phrases and a fourth option that says "I do not know." The alpha values for the test across groups were calculated for each group and were found to be equal to or higher than .78. This test comprised 25 questions (Appendix X), of which 10 were target items. The rest of the items were selected based on the first 1,000 word lists compiled through British National Corpus (BNC) and Corpus of Contemporary American English (COCA) by Nation (2012). A total of ten target items (Table 1) were selected from the video as low-frequency words for their vocabulary level. The first criterion for the selection of the target items was that they were relatively not known by a majority of EFL learners. This was determined by checking the frequency of the words in the BNC/COCA lists (Nation, 2012) as well as the MoNE curriculum. As indicated in Table 1, EFL learners in the study are less likely to know these words given the frequency rankings of the target words. The test with target items was also checked by a few teachers and piloted with a similar group of students to pre-determine any issues, and a few changes have been made prior to data collection. Next, AntWordProfiler (Anthony, 2022) was used to determine the number of times each word was repeated. The words "disability" and "bully" were found to be the most frequently repeated items in the video, for four times and three times, respectively. As for the rest of the target words, all eight target words were repeated only once in the video. Previous research has shown that word repetition count in the material should be more than 5 times for providing the optimum conditions for incidental vocabulary learning (Feng & Webb, 2020; Pellicer-Sanchez & Schmitt, 2010). Therefore, EFL learners watched the two-minute video five times in a single session to meet the minimum repetition requirement for incidental learning. Finally, the questions' order in the pretest, posttest, and delayed posttest was different to avoid the familiarity effect.

Table 1. Target words and their frequency of occurrence in the video and the corpora

Target word	Word list (BNC/COCA lists)	Frequency of occurrence
Overcome	3000	1/5*
no matter	not in the lists	1/5*
Disability	3000	4/20*
Charity	3000	1/5*
able-bodied	not in the lists	1/5*
Bully	4000	3/15*
Achieve	3000	1/5*
self-esteem	not in the lists	1/5*
Competitively	3000	1/5*
Launch	3000	1/5*

*The frequency counts of the words by the 5 times repetition of the video

Procedure

The data collection was completed over 6 weeks in four intact classes, all of which were taught by the same teacher, also the first author in the present study. Each class was equipped with

a smart board and an internet connection. Initially, the Turkish version (Aksu Balamur, 2019) of the Vocabulary Size Test (Nation & Beglar, 2007) was administered, and the mean average was found to be 53.82 out of 90. The classes were randomly assigned to one of the four following conditions: experimental group 1 (EG 1, $n = 23$) read printed video transcript without viewing the video, experimental group 2 (EG 2, $n = 23$) viewed the video without the transcript, experimental group 3 (EG 3, $n = 26$) viewing video with printed transcript, and the control group (CG, $n = 28$) receiving no treatment. Participants in EG 3 were provided with the transcript to be read once before the video and were not given any additional instructions. They were allowed to refer to the transcript as they wished.

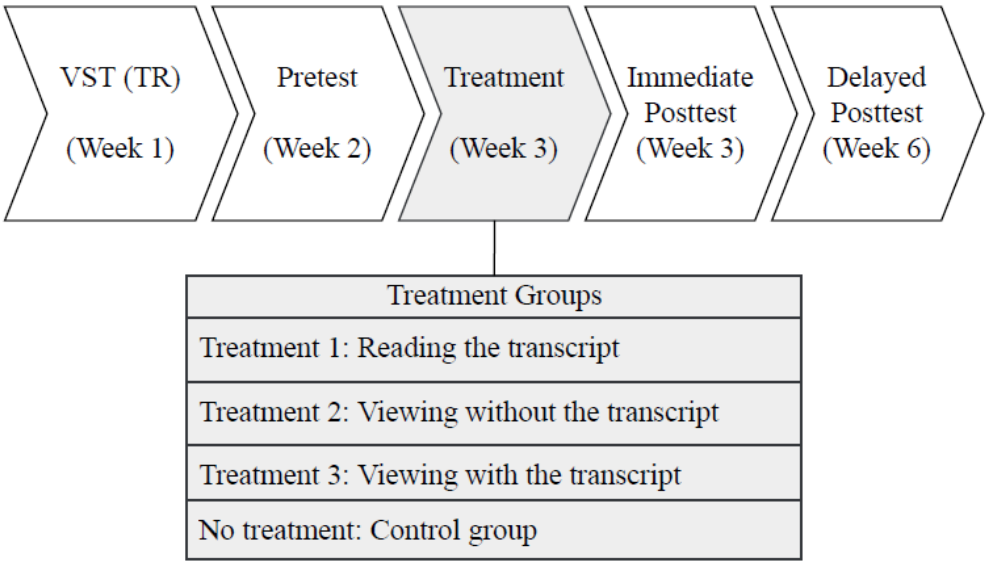

Figure 1. Summary of the research design and experimental conditions

Before the treatment, participants in all groups took the pretest. The teacher instructed the students to choose the right meaning for the words only if they already knew the meaning without wild guessing. If they did not know the meaning, then they were asked to choose the option "I do not know." The following week, a 2.40-minute video was viewed five times by all participants in three experimental groups in a single lesson hour (40 minutes). An immediate posttest was given to all participants after the treatment. The control group took the posttest in the same week. Three weeks later, the same test, with questions presented in a different order, was administered to all participants as a delayed posttest. Figure 1 presents a summary of the design and the procedures.

Data Analysis

For the initial coding and preparation of the data obtained from the adapted VST, pretest, posttest, and delayed posttest, an online application that enables teachers to grade multiple-choice papers was used to tabulate the data into a spreadsheet for statistical analysis. Each correct response was assigned "10" making the maximum score 100. To answer the first group of research questions, the assumptions for repeated measures (RM) ANOVA were checked. The skewness and kurtosis values were examined for violations of the normality assumptions associated with the distributions, and no significant violations were found. Also, the assumption of equal variances

appeared plausible through an examination of boxplots, summary statistics as well as non-significant Levene's test result ($p > .05$). Mauchly's test indicated that the assumption of sphericity was not violated, $\chi^2(2) = 2.06$, $p = .36$. Having met the assumptions, an RM ANOVA was conducted to see whether there is a difference between pretest, posttest, and delayed posttest scores across groups. Also, to determine the words that were most commonly learned incidentally, a scoring method was used. When one of the target words was incorrect in the pretest but correct in the posttest, the word was considered to be learned, and the learning ratio of the words was counted by looking at the gains. Therefore, the highest learning ratio difference showed the words which were learned the most by EFL learners.

RESULTS

Table 2 below summarizes the descriptive statistics including means and standard deviations for each test across groups. In order to answer the first research question, a Repeated Measures (RM) ANOVA was conducted in order to determine whether the test scores that were associated with treatment differed significantly. In the analysis, the within-group component was time (pretest, posttest, and delayed-posttest) while the between-group variable was treatment.

Table 2. Descriptive statistics on the dependent measures

		Pretest	Immediate Posttest	Delayed Posttest
Group	*N*	Mean *(SD)*	Mean *(SD)*	Mean *(SD)*
Reading (EG 1)	23	17.39 (10.96)	30.87 (13.79)	28.26 (19.69)
Viewing (EG 2)	23	13.04 (13.96)	22.61 (19.36)	19.57 (20.33)
Viewing+reading (EG 3)	26	19.23 (13.54)	34.66 (16.55)	32.31 (21.04)
Control	28	9.64 (9.62)	16.07 (11.33)	16.07 (11.97)
Total	100	14.86 (12.02)	26.05 (15.26)	24.05 (18.26)

*Maximum score for the tests was 100.

After the assumptions of an RM ANOVA were met, to check whether all four groups were homogenous in their pretest scores, a one-way ANOVA was conducted, and the findings indicated no statistically significant differences across groups except for EG 3 and CG, $F(3, 96) = 3.38$, $p = .02$. The results of RM ANOVA revealed a significant main effect of Time, $F(2, 192) = 22{,}16$, $p < .001$, $\eta_p^2 = .19$ and a significant main effect for Group $F(3, 96) = 8.85$, $p < .001$, $\eta_p^2 = .22$. However, the findings revealed no interaction effects for Time and Treatment, $F(6, 192) = .78$, $p < .05$, $\eta_p^2 = .02$.

A post hoc pairwise comparison using the Bonferroni correction for the Time variable further revealed a statistically significant increase in test scores between the pretest and posttest, $t(96) = -6.58$, $p < .001$, and similarly between pretest and delayed posttest, $t(96) = -5.24$, $p < .001$. No significant effects for Time were noted between the post-test and delayed post-test scores, $t(96) = 1.04$, $p = .9$. Moreover, tests for simple effects with Bonferroni correction across treatment groups indicated that there was a significant increase in immediate post-test scores compared with pretest scores for both EG 1 ($p = .02$) and EG 3 ($p < .001$). However, no significant differences were detected between the pretest and the immediate posttest scores for EG 2 ($p > .05$) and CG ($p > .05$) although both scored higher on the posttest than the pretest.

To answer the second research question, Bonferroni posthoc pairwise group comparisons were made and the findings revealed that significantly better performance was achieved by EG 1 and EG 3 compared with the CG, $p = .003$ and $p < .001$, respectively. EG 3 also scored significantly higher than EG 2 ($p = .015$). Further posthoc tests of the immediate posttest showed that EG 1 and EG 3 performed significantly better on the immediate posttest than CG, $p = .002$ and $p < .001$, respectively. A significantly higher score by EG 3 than EG 2 was also detected ($p = .027$).

Table 3. Post-hoc pairwise comparisons

Comparison		Mean Difference	SE	*t*	*p*
Group Type (A)	Group Type (B)	(A-B)			
Reading (EG 1)	Viewing	7.10	3.41	2.08	.24
	Viewing + reading	-3.21	3.31	-0.97	1.00
	No treatment control	11.58	3.25	3.56	.003**
Viewing (EG 2)	Viewing + reading	-10.31	3.31	-3.12	.015*
	No treatment control	4.48	3.25	1.38	1.00
Viewing+reading (EG 3)	No treatment control (CG)	14.79	3.15	4.70	<.001**

Note. *$p < .05$. **$p < .01$.

Although there were no significant group differences from post-test to delayed post-test scores, a Bonferroni adjusted posthoc test comparing the differences specifically from the post-test to the delayed post-test scores indicated similar findings in that EG 1 scored significantly higher on the delayed post-test than CG, $p = .005$. Additionally, EG 3 scored significantly higher than CG ($p < .001$) and EG 2 ($p = .016$). Finally, EG 1 and EG 3 were found to have scored significantly higher on the delayed posttest than the pretest, $p = .04$ and $p = .02$, respectively, which indicated that the incidental vocabulary learning gains were retained three weeks after the treatment. The findings overall indicated a significantly different learning effect for those learners in EG 1 and EG 3. Table 3 and Figure 2 below illustrate a summary of the findings.

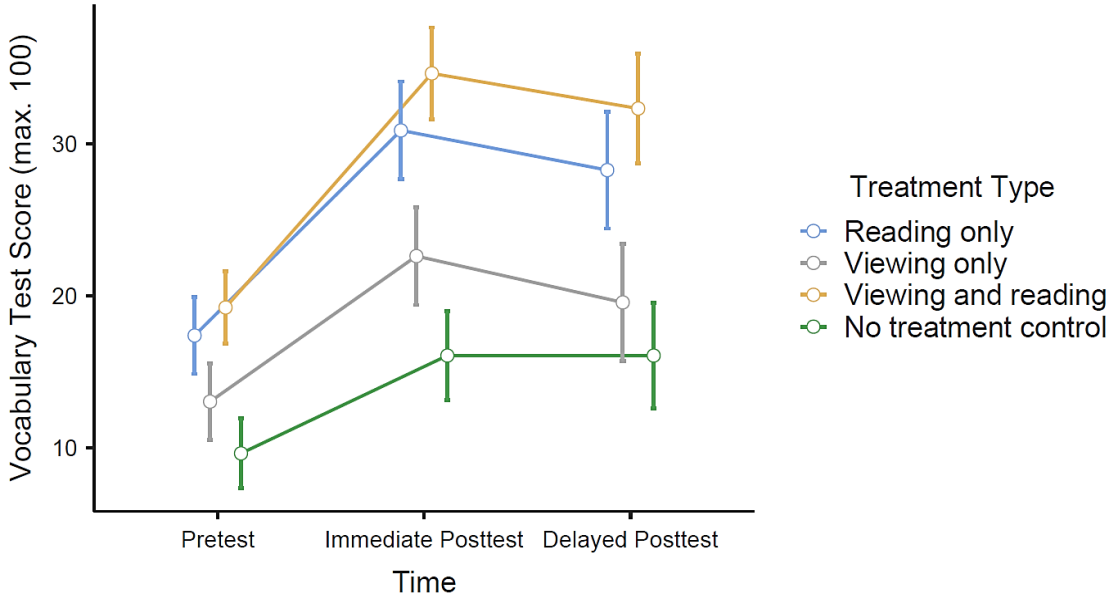

Figure 2. Test scores on incidental vocabulary learning by treatment group

DISCUSSION

The purpose of the present study was to investigate how three different input modes (reading, viewing, and viewing with the transcript) would contribute to fifth-grade EFL learners' incidental vocabulary learning. Based on the VLT, learners in different groups were similar in their vocabulary knowledge and mostly similar in their pretest scores. The first research question examined whether and to what extent each of the three input modes contributed to IVL. The findings revealed that compared to the control group, incidental vocabulary learning occurred under two of the four experimental conditions. The immediate posttest results showed that EFL learners reading and viewing with the transcript groups gained vocabulary incidentally, and they retained some of those words through the delayed posttest. The findings are in support of previous research which shows that written input (e.g., Feng & Webb, 2020; Teng, 2018) leads to gains in incidental learning of vocabulary. Similar findings were found for the group who viewed the video with the transcript. Although there are no directly similar interventional conditions reported in the literature, the findings of the study might be comparable to those of previous studies examining the effects of viewing with captions. The differences between viewing with captions or any on-screen text as opposed to viewing with the transcript are not deniable. However, because the learners were exposed to the video five times, they were likely to find the opportunity to read the transcript and watch the video at least once. In this respect, given the transcript is also a form of written input, the findings could be considered consistent with previous findings underscoring the importance of audiovisual input accompanied by written input (Teng, 2022; Yuksel & Tanriverdi, 2009).

Finally, although learners in the viewing group made some gains in IVL the improvement was not statistically significant, which is not in line with the findings of the previous studies showing evidence for gains in IVL (Feng & Webb, 2020). This could be due to various learner- and context-related variables. EFL learners in this study were lower secondary school students with limited exposure to L2 English. Their global proficiency and vocabulary knowledge could be considered low; therefore, they are not used to watching videos in English without captions or subtitles. Rather, EFL learners are more used to activities such as listening and reading rather than viewing (Feng & Webb, 2020), which could also account for the lack of significant gains in this group. Overall, the findings are important in showing that reading as well as viewing with the transcript contributes to IVL. This is important in exacerbating some previous studies which already established the role of reading and viewing with written input (e.g., on-screen text) in incidental vocabulary acquisition (Neuman & Koskinen, 1992; Peters, 2019; Yuksel & Tanriverdi, 2009).

In answer to the second research question, the findings further indicated that the group who viewed the video with the transcript made more gains compared to the gains made by other groups. However, the difference in gains was not significant for the reading group, which indicates gains in IVL for both the reading and viewing with the transcript were similar in effect. These results only partially support previous research mainly because viewing did not lead to IVL in the present study. Feng and Webb (2020) showed that watching and reading modes contribute to incidental vocabulary learning equally well, but in this study, this was only true for the reading and the

viewing with the transcript conditions. Neuman and Koskinen (1992) reported reading to be less effective compared to viewing with written input, which was not supported in the present study. Viewing, on the other hand, did not seem to lead to any significant incidental vocabulary gains in the present study. Montero Perez et al. (2014) found that audiovisual input with on-screen text led to higher gains in incidental vocabulary learning. This is mostly consistent with the present study because it evidences how audiovisual input supported with written contributes to IVL more than audiovisual input alone.

The findings provide strong evidence which supports the occurrence of incidental vocabulary learning through reading as well as viewing with written input. Because viewing with written input was found to be as effective as reading, L2 learners may be encouraged to watch videos with written input as an extensive learning activity. Although the increase in IVL gains was higher for the group viewing with the transcript were higher than those made by the reading group, the difference was not significant. Therefore, the present study does not completely support the Dual Coding Theory (Sadoski & Paivio, 2013) and Multimedia Learning Theory (Mayer, 2009), both of which underscore the superiority of multimodal input in facilitating greater gains compared to unimodal input. There may be various reasons for this. In Turkish secondary schools, learners mostly focus on improving their reading skills because of the written examination administered to eight grade students by the Ministry of National Education to place them in more selective high schools. Therefore, as noted earlier, they may not be familiar with viewing alone as it might have seemed "less important" for them or "less pedagogical" as they do not normally view videos with no written support in L2 English. In light of the differences between the findings of this study and those of previous studies, there is a need for more research comparing different forms of input and incorporating different variables related to learners and texts.

The study is not without limitations. First of all, limitations that are found in similar studies investigating IVL by comparing different input modes apply in this study. Although learning conditions that are strongly controlled in this study constitute merit in terms of methodological rigor, it may be problematic in terms of ecological validity. This is mainly because these conditions may not reflect how learners learn words incidentally in reality such as by using an online dictionary or consulting a friend/the teacher (Webb et al., 2023). Besides, the test measuring learner gains had a unidimensional structure asking learners to choose a word on a multiple-choice test, which allows guessing. Studies with mixed approaches and multiple forms of tests measuring vocabulary gains through a variety of different tests such as meaning recall or form recognition could help better understand the gains in IVL. Furthermore, other qualitative methods of data collection such as interviews could help explain the findings, for example, to understand why viewing did not facilitate learning in this study. Although the video viewed in two of the experimental conditions was shown multiple times for repetition of target words, the present study did not examine any frequency effects. This was mainly because only except for two words, the rest of the target items were all repeated for the same amount of time. This would make it difficult to compare the effects of frequency. However, follow-up studies looking at the effects of frequency, and other text-related or learner-related variables are encouraged. Despite the limitations, the current study provides various pedagogical and theoretical contributions to explaining incidental vocabulary learning in L2 English. This is crucial given that intentional vocabulary learning alone may not supply the required number of words for learners to function in written and spoken English without the support of incidental vocabulary acquisition (Webb, 2019).

This study has various pedagogical implications. First, teachers play an important role in raising EFL learners' awareness of incidental vocabulary learning. This may be achieved by helping them be exposed to a variety of input types of their own choice for longer periods. Since the present study showed that reading and audiovisual input with written text are equally beneficial, learners could choose their medium of learning at their own will. Extensive reading and viewing could be encouraged among learners by explaining their value in learning and emphasizing the importance of choosing the materials at the right level. It should, however, be emphasized that incidental and intentional vocabulary learning should not be considered "in competition with each other but rather as useful complements to each other" (Webb, 2019, p. 6).

Another pedagogical implication is that L2 English learners should be guided and given opportunities in the classroom to interpret word meaning from the context since they need to develop their ability to come up with strategies when faced with unfamiliar words in the input (Schmitt, 2010). This could help them expand their vocabulary and learn how to tackle unfamiliar words and increase their rate of comprehension. In this vein, the findings encourage learners to expose themselves to written and audiovisual materials to improve their level of vocabulary through incidental learning.

Finally, the present study also provides implications for practitioners and materials designers because the findings indicate what type of input mode contributes to learners' incidental vocabulary more. This could help prioritize learning tasks and activities which could facilitate vocabulary learning as making such decisions at the "micro level of learning tasks" is crucial in teaching and learning (Laufer & Hulstijn, 2001, p. 9).

To conclude, the present study was designed to determine how input mode affected incidental vocabulary learning by fifth-grade Turkish EFL learners. The findings showed that incidental vocabulary learning occurred under all three experimental conditions, but only reading and viewing with the transcript were shown to make significant gains. Although learners in the latter made more gains than those in the former group, this difference was not significant. Therefore, reading as an input was shown to be equally effective as the audiovisual mode with written input. In line with this, teachers and learners should be encouraged to realize the benefits of different input modes in acquiring vocabulary incidentally.

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APPENDIX

A screenshot of the video and the platform used in the study
https://learnenglishkids.britishcouncil.org/video-zone/brydis-story