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The roles of standard, bimodal, and reversed subtitles on English vocabulary learning

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Article Info

Abstract

This 15-week mixed method study examined the impact of standard, bimodal, and reversed subtitles on participants' vocabulary learning, particularly incidental vocabulary learning and retention in a prerequisite English foundation course. Three intact groups, each receiving a different treatment, of first-year non-English major university students ($N = 117$) were randomly assigned to the researchers. Data were collected using one episode of documentary series, a vocabulary knowledge test: a pre-test, an immediate post-test, and a delayed post-test, a comprehension test, and an interview. The findings revealed that all three groups had a high level of comprehensive knowledge of the video content. However, when comparing pre- and immediate post-test scores, the reversed subtitle group displayed a significant increase in vocabulary knowledge, including word form and meaning whereas the groups with standard and bimodal subtitles only showed a significant knowledge gain in meaning. In the delayed post-test conducted approximately three months after the video exposure, the reversed subtitle group maintained their vocabulary knowledge, aligning with their high scores on the immediate post-test during this time span. Conversely, the groups with bimodal and standard subtitles experienced a significant decline in vocabulary knowledge. The interview data highlighted that all three types of subtitles helped with word meaning gains, but their impact on improving word form is unclear.

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Introduction

Vocabulary knowledge is a key component for second language learners to be able to communicate effectively (Schmitt, 2010). To build substantial vocabulary knowledge, incidental vocabulary learning stands out as a highly effective approach (Ahmad, 2012). Incidental vocabulary acquisition accrues as a byproduct of extensive reading, viewing films, or other materials for pleasure with no explicit intention to learn words from contexts (Webb, 2020). Given today's digital landscape, the proliferation of online platforms has made audiovisual materials the primary source of enjoyment for second language learners' exposure beyond formal classrooms. Learners benefit immensely from a visual and verbal system that can independently support each other to strengthen language recall, comprehension of speech, and lexical use (Pavio, 1986). The multimedia learning theory of Mayer (2009) states that learners acquire more knowledge from pictures and words than from words alone. Contextualizing words through the simultaneous combination of image, sound, and text can reinforce new words and promote deeper comprehension of the texts. It is believed that viewing audiovisual materials supports vocabulary acquisition and that the use of subtitles facilitates this process (Fievez et al., 2020). Generally, there are three types of subtitles, which are standard, bimodal, and reversed subtitles. Each comes with its own benefits and limitations. Although a number of studies have confirmed the benefits of viewing subtitled videos on vocabulary acquisition (Raungsawat & Chumworatayee, 2021; Teng, 2022; Webb, 2020), the advantages and disadvantages of each type remain inconclusive. Therefore, the utilization of audiovisual materials with different types of subtitles in English vocabulary learning needs to be further explored.

Literature Review

Subtitle Types

Zanon (2007) classifies subtitles into three types: standard, bimodal, and reversed. First, standard subtitles display L2 audio with L1 subtitles. Second, bimodal subtitles present both L2 audio and L2 subtitles at the same time. Third, reversed subtitles employ L1 audio and L2 subtitles.

Vocabulary Learning

Different subtitle types support learners to acquire vocabulary differently. While standard subtitles make it easier for learners to understand the content and vocabulary (Raungsawat & Chumworatayee, 2021), bimodal subtitles help students to acquire new vocabulary more easily and quickly because the visual and auditory reinforce each other without causing any lexical interference (Guichon & McLornan, 2008). On the other hand, Ávila-Cabrera (2021) states that reversed subtitles are the most beneficial for L2 comprehension and contextual meaning due to the fact that the L1 auditory input facilitates understanding, which provides more time for learners to observe and process L2 texts.

When comparing the effectiveness of standard, bimodal, and reversed subtitles on L2 vocabulary recognition and recall, Zarei (2009) concludes that bimodal subtitles are the most effective. However, Mardani (2016) analyzed the effect of movies with standard, bimodal, and reversed subtitles on L2 vocabulary learning and found that the reversed subtitles group performed significantly better and learned more new vocabulary. Hence, a clearer picture of which subtitle type is more effective still needs to be scrutinized.

Vocabulary Retention

While acquiring new vocabulary is necessary, ensuring its lasting retention is equally important. However, most research focuses on recognizing and recalling words immediately after learning the input without assessing their long-term usage (Puimège & Peters, 2019). To support the vocabulary learning retention, a deeper mental processing of vocabulary is required. In that sense, the incidental vocabulary learning process of engaging learners in actively deciphering meanings through contextual clues present in the texts could stimulate the deeper mental processing of the vocabulary (Ahmad, 2012). Consequently, the encouragement of deeper engagement through decoding meaning from contexts could hold the potential of fostering vocabulary retention and facilitating vocabulary acquisition at the same time.

Previous Research in Thai Context

In the context of learning English vocabulary through subtitles in Thailand, it is observed that Thai students exhibit a strong motivation for vocabulary learning and

can retain newly learned words in long-term memory (Sek et al., 2021). A study by Napikul et al. (2018) suggests that standard subtitles are most beneficial for Thai students. Such helps Thai students to use correct vocabulary when speaking, thereby improving their pronunciation. Suetrong (2015) found that bimodal subtitles were helpful in learning unfamiliar vocabulary, new idioms, slang, proverbs, and in understanding accents and dialects. Unfortunately, research in reversed subtitles is limited. The effectiveness of subtitles as a strategy for Thai students to learn vocabulary is worth investigating.

Research Objectives

This present study therefore aims to investigate (1) the extent to which standard, bimodal, and reversed subtitles impact the participants' incidental vocabulary learning and (2) the extent to which standard, bimodal, and reverse subtitles affect participants' vocabulary learning retention. Permission was received from the Research Ethics Committee of the researchers' organization to conduct this research.

Methodology

Participants

The participants, aged between 18−20 years old, comprised of three intact groups of first-year non-English major undergraduates enrolling in the same English foundation course at a public university in Thailand. They have been studying English for at least 12 years in schools as a foreign language. All participants spoke Thai as their L1, while their L2, English, based on their university entrance exam English language scores, was at the CEFR-B1 level. The three groups were randomly assigned to different treatments of standard ($n = 36$), bimodal ($n = 43$), and reversed ($n = 38$). One of the researchers is the sole instructor of this research. Before the research began, the participants were informed of the research and gave consent to participate in the study.

Materials

Apart from the subtitled videos employed as different treatments, research instruments were developed by the researchers and validated by two experts in language teaching and assessment who are fluent in both Thai and English.

Subtitled videos

The Netflix Original series "Brainchild" was purposefully chosen as it provided standard, bimodal, and reversed subtitles, which were the focus of the study. Of the 13 episodes, the 30-minute Episode 1 entitled "Social Media" was selected mainly because the words found in this episode were at the appropriate level of the participants' proficiency based on the online tool "Text Inspector" that analyzes word levels according to the Cambridge University Press's English' proficiency profile, and also because the episode's content was related to the participants' daily lives.

Vocabulary knowledge test

The Vocabulary Knowledge Test aimed to assess students' vocabulary knowledge and track their vocabulary knowledge improvement during a three-month span. The first step of the test development was choosing 20 target words. They were chosen based on the following criteria. First, the words needed to be at the participants' proficiency level of B1 based on the online tool "Text Inspector". For words that were classified as more than one level (e.g., words that were classified as A2, B1, and B2), the researchers resorted to the contextualized meaning to determine their accurate levels. The next criterion was to remove function words that possess minimal lexical meaning, transliterated words, and words contained in the main course's textbooks. Finally, 20 content words remained.

The test consisted of two parts whose format was adapted from Nation and Webb (2011) and Teng (2022). Part 1 focusing on the recall of word form requiring participants to spell the target words based on the translations given in L1 and L2. An initial letter was given to prevent the participants from supplying synonyms of the answers which could potentially disrupt data analysis. Part 2 focusing on the ability to use the target words in contexts requiring participants to choosethe correct target word presented along with three distractors to complete each simple sentence (Appendix A). Each part consisted of 20 items, with a total of 40 items. One correct answer was worth 0.5 points resulting in a total of 20 points. In Part 1 of the test, both American and British spellings and all conjugated forms of the target words were accepted as correct. Misspelling resulted in zero points.

The test was administered three times for different purposes: (1) a pre-test aiming at capturing participants' knowledge without any influence from the treatment, (2) an immediate post-test aiming at evaluating the participants' immediate incidental vocabulary knowledge,

and (3) a delayed post-test aiming at assessing participants' vocabulary retention.

Regardless of the purpose, the focus was on the same 20 target words with different sentences and distractors in Part 2 of the test to prevent participants from relying on the answers to their previous tests. No advance notice was given prior to any of the test events.

Comprehension test

The test aiming at measuring the participants' comprehension of the video content comprised five multiple-choice items and two true/false items based on the video content. The participants received one point for each correct answer, with a total of seven points. Without prior notice, the test was administered immediately after watching the selected video episode.

Interview

A semi-structured interview was individually conducted with ten randomly selected participants from each group aiming to gather in-depth information about their vocabulary learning, retention, and suggestions for vocabulary learning from the subtitled video. Each interview was conducted outside class time following the delayed post-test.

Data Collection

To avoid priming participants to focus intentionally on learning new words, the study purpose was not fully revealed at the beginning. Instead, the participants were told that the study was focused on the learners' comprehension of an English documentary series.

In the second week of the semester, the pre-test was administered before the treatment. The participants had 30 minutes to complete and return Part 1 before another 30 minutes to complete Part 2 to prevent interference effect as the content of each part may facilitate the completion of the other.

In the third week of the semester, the participants were asked to watch the randomly assigned type of subtitled video during the regular class time. They were allowed to watch the video only once and not allowed to take notes. After the treatment, the participants were given 10 minutes to complete the comprehension test and one hour to complete the immediate post-test in the same manner as the pre-test.

Finally, in the 15th week of the semester, the delayed post-test was administered in the same manner as the pre-test. A 10-minute interview was also conducted in the classroom outside class time by the instructor during this week.

Data Analysis

The study used the dependent t-test and a One-Way ANOVA to determine the effectiveness of standard, bimodal, and reversed subtitles in the participants' incidental vocabulary learning and retention collected from the pre-test, immediate post-test, and delayed post-test. To further examine the findings, a post-hoc test was used to scrutinize the specific variations among groups. The comprehension test was analyzed using descriptive statistics to determine the participants' understanding of the video content with different subtitles. The data obtained from the interview were analyzed using content analysis and frequency. The analysis of such qualitative data was validated by two experts to ensure accuracy and reliability.

Results

The research results are presented in two sections: participants' incidental vocabulary knowledge improvement and participants' vocabulary knowledge retention.

Participants' Incidental Vocabulary Knowledge Improvement

Quantitative results

Initially, to ensure that the participants' vocabulary knowledge prior to the treatment had no effect on the improvement, the data obtained from the pre-test were analyzed using a One-Way ANOVA, which showed similarity in the participants' vocabulary knowledge prior to the treatment ($p \geq .05$).

Then, the vocabulary knowledge improvement was evaluated based on the data obtained from the pre-test and immediate post-test, the analysis of the dependent t-test (Appendix B) revealed overall vocabulary knowledge improvement at a significant level ($p \leq .05$) in participants from all the three groups. Similarly, the results from Part 2 of the test revealed an improvement at a significant level in all the three groups. However, the results from Part 1 of the test demonstrated an improvement at a significant level only in the reversed group, $t(37) = -1.19$, $p = .02$. It could therefore be inferred that the participants, regardless of the treatment received, showed significant progress in acquiring the meaning.

However, the significant progress in word form can be confirmed only in those in the reversed group.

Additionally, a One-Way ANOVA findings as illustrated in Table 1 demonstrated a significant difference in the average mean scores of immediate post-test among the three subtitle groups $F(2, 114) = 1.42$, $p = .03$, especially in Part 1 $F(2, 114) = 2.45$, $p = .04$ but showed no significant difference in the scores from Part 2 $F(2, 114) = 1.37$, $p = .25$. After conducting post-hoc tests to determine which pairwise comparison contributes to the significant difference observed with a One-Way ANOVA, a statistical significance was observed in most pairs and in most parts (Appendix C). These results suggest that the different types of subtitles used to facilitate vocabulary knowledge improvement had varying effects on incidental vocabulary learning, especially the form part. Specifically, the standard and bimodal subtitles exhibited significant differences in word form when compared to the reversed subtitles.

Furthermore, based on the data obtained from the comprehension test, the descriptive statistics showed that the average mean scores of the three groups of participants were similarly high (Appendix D). This suggests that the different types of subtitles used had no significant impact on the participants' comprehension.

Qualitative results

Aside from the test scores, the effects of the subtitles on participants' incidental vocabulary learning were exhibited from the analysis of the data obtained from the interview. Participants in the standard group reported that with the display of L1 at the bottom, they could focus more on the word they heard to match with the actions presented in the video. To illustrate, one participant shared that when watching the video, he/she would observe the actions of the characters to better understand unfamiliar words while paying no attention to spelling (Appendix E). Similarly, participants in the bimodal group reported that the synchronization of audio-text directed their attention to the words' meaning and how the words were pronounced, especially ones possessing a similar sound (Appendix F). The participants from both groups remarked that their spelling ability did not improve and required appropriate guidance from instructors.

In contrast, participants in the reversed group found that the L1 audio allowed better understanding, as they could devote their full attention to learning new vocabulary from reading the subtitles (Appendix G). This demonstrated that the English subtitles were beneficial in acquiring new vocabulary both in form and meaning.

Although the participants seemed to have different perception on spelling and pronunciation, the participants in all three groups reported no challenge in understanding the content from the video. They did not find the content hard to understand or follow.

In summary, according to the quantitative and qualitative results, the study indicated that the participants who watched the video with reversed subtitles performed better than those with standard and bimodal subtitles, despite having similar prior vocabulary knowledge. The participants in the reversed group felt that the L1 audio facilitated their full attention on vocabulary learning without worrying about the comprehension. As such, the reversed subtitles assist in comprehending word formation and meanings. In contrast, the participants in the bimodal and standard groups who experienced L2 audio tended to focus more on matching words and actions in video rather than focus on how words were spelt. Thus, the participants in the bimodal and standard groups gained more in semantic knowledge but less vocabulary knowledge from the subtitles, partly due to their efforts to simultaneously grasp pronunciation and content while understanding the video.

Table 1 One-Way ANOVA results of participants' average mean scores of immediate post-tests

Test Part		Sum of Squares	*df*	Mean Square	*F*	*p*
Part 1: Form	Between group	2.534	2	1.267	2.45	.04*
	Within group	60.398	114	0.516		
	Total	62.933	116			
Part 2: Meaning	Between group	40.954	2	20.477	1.37	.25
	Within group	1743.944	114	14.906		
	Total	1784.898	116			
Total	Between group	42.070	2	21.035	1.42	.03*
	Within group	1725.242	114	14.746		
	Total	1767.312	116			

Note: *$p \leq .05$.

Participants' Vocabulary Retention

Quantitative results

The data obtained from the immediate and delayed post-tests were used to evaluate the participants' vocabulary retention after the three-month interval thus eliminating the threat to the internal validity of the results. The results gained from the delayed post-test with the descriptive statistics and *t*-test (Appendix H) showed that while the standard and bimodal group showed a significant decline in vocabulary knowledge in both Part 1 and Part 2, the reversed group's average mean scores displayed no change, $t(37) = 11.18$, $p = .38$. This signifies that the participants were able to retain the vocabulary during this time span.

To compare the participants' overall vocabulary retention affected by different subtitles, statistical analysis was conducted using a One-Way ANOVA in Table 2 and post-hoc analysis on the average delayed post-test scores (Appendix I). Table 2 shows a significant difference in vocabulary retention in both Part 1 and Part 2. After conducting post-hoc tests to explore each pairwise of the vocabulary knowledge retention across different subtitles, a statistical significance was observed in all pairs and in both parts of the tests among the three subtitle groups: standard, bimodal, and reversed. These results underscore the substantial impact of different subtitle types on participants' vocabulary knowledge retention, highlighting the importance of subtitle choice in facilitating long-term vocabulary acquisition.

Qualitative results

Based on the data obtained from the interview, the participants revealed the reasons for being able, or not able, to retain vocabulary across different subtitles. Participants in the standard group reported that standard subtitles assisted in understanding the overall content of the video but may not provide the necessary support for word-level acquisition and retention. This limitation holds true in translation, as a word-by-word approach may not effectively facilitate content comprehension. The primary focus of standard subtitles is often on translating entire phrases, which can lead to overlooking word-level acquisition and difficulty in retaining newly learned words. Therefore, the difficulty faced by the standard subtitle group in retaining vocabulary can be attributed to their approach. (Appendix J).

Participants in the bimodal group reported that their language proficiency and reading speed might interfere with their ability to retain the words presented in the subtitles (Appendix K). They felt that they were not at the appropriate proficiency levels to understand the video audio in L2, read the subtitles, and decipher the newly learned words at the same time. As a result, the bimodal group's vocabulary retention is influenced not only by the method of learning but also by their reading speed and language proficiency.

On the other hand, participants in the reversed group reported that they could comfortably and actively pay attention to the video and ended up learning and remembering words without knowing it (Appendix L). Reversed subtitles appeared to enhance vocabulary retention due to their impact on learners' engagement in the learning process. By providing the audio in the first language with subtitles in the learners' second language, reversed subtitles make the learning experience effortless and ease the participants' comprehension, which in turn boosts learners' confidence and keeps them actively engaged with the subtitles.

Discussion

The results of the study seem to show that the type of subtitles used in the video did not have an impact on comprehension. One plausible explanation for the similar test scores is that imagery is a powerful mode of meaning-making (Group, 2016). Comprehension requires

Table 2 ANOVA results of participants' average mean score of delayed post-tests

	Test Part	Sum of Squares	*df*	Mean Square	*F*	*p*
Part 1: Form	Between group	2.275	2	1.138	1.93	.00*
	Within group	33.578	114	0.589		
	Total	35.853	116			
Part 2: Meaning	Between group	60.558	2	30.279	1.09	.00*
	Within group	1574.588	114	27.624		
	Total	1625.146	116			
Total	Between group	68.033	2	34.017	1.25	.00*
	Within group	1540.403	114	27.025		
	Total	1608.436	116			

*Note: *$p \leq .05$.

viewers to construct meaning from available sources of information and to create a mental representation of input (Buck, 2001). In the context of the present study, the selected video may have presented concrete and clear information that was appropriate for the participants' level, making it easier for them to understand the visuals.

Furthermore, subtitles may also play a crucial role in boosting vocabulary acquisition. Kanellopoulou (2019) conducting a comprehensive study exploring the impact of audiovisual materials with subtitles on vocabulary learning found similar findings, which highlight the positive effects of audiovisual materials with subtitles on incidental vocabulary learning. This is also in agreement with Napikul et al. (2018) who claim that students' vocabulary knowledge is enriched through the incorporation of subtitled videos. It would seem therefore that subtitles allowed learners to reinforce vocabulary by reading subtitles while simultaneously listening to the audio.

Despite the results showing overall positive effects on comprehension and vocabulary acquisition at the level of meaning, different types of subtitles seemed to yield different results in vocabulary acquisition at the level of word form and retention.

This study illustrates that standard subtitles are geared more toward comprehension in word meaning as translations are sometimes non-literal and cater for phrases rather than vocabulary, which leads to a better understanding of a content and general word meaning. A related study by Napikul et al. (2018) sought to determine the most effective subtitle type for developing tenth-grade EFL students' listening comprehension, considering bimodal, standard, and no subtitles. Their findings highlighted the significant impact of first language (L1) subtitles on tenth-grade students' listening comprehension compared to bimodal subtitles and the absence of subtitles. Notably, L1 subtitles demonstrated a more substantial influence on content comprehension. This resonates with the findings of Karimah (2019), which indicate a preference among students for standard subtitles due to their usefulness in grasping the content comprehension. Although it is evident that watching standard subtitles could help understanding of the video content, there is no effect with regards to vocabulary learning, especially word spelling. This is explained by the fact that learning vocabulary with standard subtitles may require watching the video more than once (Ebrahimi & Basaee, 2016).

The participants viewing the bimodal subtitles also displayed more vocabulary knowledge gains only in terms of meaning, and not with the spelling and retention.

This signifies that although there is a written form synchronizing with the audio provided to assist with the word spelling but without the instructed attention to it, the subtitles cannot be a factor in learning spelling. Furthermore, the reason for this could stem from the fact that spelling ability is influenced by a variety of skills rather than simply listening to the sound or reading the texts. Learning how to spell words effectively involves understanding sounds, word structures, and spelling rules (Keuning & Verhoeven, 2008). All these components require time to progress from not knowing the word to mastering the word efficiently.

Apart from the word meaning gains, the bimodal group reported that the utilization of bimodal subtitles primarily contributed to the understanding of word pronunciation, rather than exerting a significant impact on vocabulary acquisition. This observation is congruent with the findings of the preceding investigation of bimodal subtitles and word pronunciation (Ambele & Abam, 2020). Cook et al. (2016) further emphasize that second language learners often struggle to distinguish between two words that only differ by a single sound. Therefore, when audio is synchronized with subtitles, it becomes more manageable to differentiate certain word pairs. It is believed that bimodal subtitles help retune L2 learners' speech perception by strengthening the link between the auditory and written form of words during the processing of bimodal input (Mitterer & McQueen, 2009) and contribute to forming a sense of confidence in the learners which will motivate them to repeat vocabulary from the subtitles with effective pronunciation and accent gained as they watch (Ambele & Abam, 2020).This suggests that auditory inputs should be accompanied by written verbal ones for effective word pronunciation understanding.

Reversed subtitles seemed to provide distinct advantages over standard and bimodal subtitles, particularly when it comes to incidental vocabulary knowledge and retention. This finding aligns seamlessly with the conclusions drawn in the research conducted by Ragni (2020), which emphasized the pronounced benefits of reversed subtitles in the context of vocabulary learning that a significant proportion of second language input was effectively retained after a single exposure to a video featuring reversed subtitles.

Gorjian (2014) illustrates this phenomenon of the reversed subtitle groups outperforming standard and bimodal subtitles in vocabulary learning by highlighting that individuals can retain about 10 percent of what they hear, 20 percent of what they see, and 80 percent of what they see and actively engage with. Memories that

were deeply processed led to longer lasting memories while shallow processing led to memories that decayed easily (Craik & Lockhart, 1972). When comparing the three subtitling conditions, the reversed group felt less anxiety and more comfortable as the audio was in their L1, and the subtitles supported the visual elements. This led the reversed group to be more motivated, and actively engaged in the learning process. This sense positively influenced their satisfaction with their learning progress and fostered a constructive attitude, thereby motivating them to sustain their learning engagements. This, in turn, led to in-depth processing enabling the participants to acquire and retain vocabulary items in their memory for longer periods.

The study also shed light on an additional factor affecting comprehension and vocabulary acquisition. A certain level of proficiency is needed for learners to benefit from subtitles. In this study, the participants acknowledged that their L2 proficiency level was not high enough to effectively learn vocabulary through subtitled videos. Consequently, although there was a development in vocabulary knowledge gains, the scores remained low. Participants believed that high proficiency learners could draw more from content to infer meaning and facilitate possible acquisition. These high proficiency participants would be able to infer word meanings from the content in the documentary and facilitate the acquisition of lexical knowledge. This is in line with the study of Suarez and Gesa (2019). This points to why the reversed subtitle approach proves particularly beneficial for the non-advanced learners in this study, as it helps alleviate their anxiety by providing a more comfortable and comprehensible input, with the additional support of target language subtitles displayed at the bottom (Papadopou & Gouleti, 2022).

Implications

The positive influence of audiovisual with subtitles seemed to yield one major pedagogical implication that learning English vocabulary through audiovisual with subtitles should be employed as an effective educational resource, especially reversed subtitles for vocabulary learning. Unfortunately, many educators are not familiar with its educational potential (Papadopou & Gouleti, 2022) and do not utilize this approach in their teaching methods. As a result, it is crucial to provide training for instructors. As a start, instructors should develop teaching worksheets that complement the audiovisual content and provide guidance on where and what aspects

of vocabulary usage and spelling to focus on by breaking down the video into shorter segments and pausing to highlight specific vocabulary usage that can help retain learners' attention.

Conclusion and Recommendation

Certain unavoidable limitations of the present study shed light on aspects to be considered when interpreting the results of the present study as well as when designing future studies to further contribute to the field.

Firstly, it must be noted that vocabulary gains were measured based on only words from B1 level. It may be useful for future research to compare incidental learning of more target words from different levels. Secondly, only two aspects of vocabulary knowledge gains in terms of form and meaning were assessed. A more extensive exploration would have enabled a more thorough comparison of those aspects of vocabulary gained such as pronunciation, grammar, etc.

Thirdly, to assess learners' vocabulary knowledge before the treatment, it is advised to employ creative and authentic methods that go beyond surveys or multiple-choice questions, as those can lead to learners merely guessing the correct answers. This is because vocabulary knowledge cannot be assessed simply by either knowing the word or not knowing the word. It cannot be viewed as a mere form-meaning connection (Arndth & Woore, 2018). A combination of tasks should be used. Instructors can ask students to identify the antonym of a given word or select the most appropriate usage of a word within a sentence. This approach encourages a deeper understanding and application of vocabulary, providing a more reliable evaluation of learners' proficiency. Additionally, traditional test formats could also draw the participants' attention to the fact that the study is concerned with vocabulary acquisition, possibly leading them to try harder to learn new words encountered during the treatment and thereby disturbing Hulstijn (2001) operationalization of incidental learning involving natural vocabulary learning from inputs. In future studies, efforts could be made to reduce these factors to ensure more accurate results and to better understand how much vocabulary can be learned incidentally through subtitles.

In conclusion, comprehension in audiovisual materials seemed to be facilitated by the presence of subtitles. Although standard and bimodal subtitles might be ineffective in vocabulary learning at the level of word form, they can contribute to vocabulary learning at the level of word meaning. The use of reversed subtitles

demonstrated superiority in facilitating effective vocabulary learning and retention in both form and meaning. Collectively, these findings underscore the advantages of audiovisual materials and subtitles on language learning process, equipping educators with valuable insights for tailoring their instructional approaches to align with distinct learning objectives.

Conflict of Interest

Fundings

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