



Effect of TED Talks on University Students' Speaking Skill Competency: A Meta-Analysis

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Abstract

This meta-analysis investigated the effectiveness of using TED Talks to improve speaking skills among university students. A comprehensive literature search identified 16 relevant experimental studies that compared speaking outcomes between groups using TED Talks and control groups. Results revealed an overall large, statistically significant positive effect ($g = 1.521$, $p < 0.001$), indicating that students who utilized TED Talks scored substantially higher on speaking measures than control groups. However, a high degree of heterogeneity ($I^2 = 97.5\%$) suggested variability in effectiveness across studies. When examined by country, substantial positive effects were found for Egypt ($g = 5.579$) and Saudi Arabia ($g = 1.955$), with high positive impacts in Indonesia ($g = 0.889$), Pakistan ($g = 1.188$), and Russia ($g = 1.138$). More modest gains around 0.3-0.7 standard deviations emerged for South Korea and Turkey, while China showed a negligible effect ($g = 0.072$). Despite some individual null/negative findings, this meta-analysis provides robust evidence that integrating TED Talks can substantially enhance university students' speaking proficiency, particularly in particular national contexts. Potential moderators influencing effectiveness and recommendations for optimizing TED Talk implementation are discussed.

Keywords: Language Instruction, Meta-Analysis, Speaking Skills, TED Talks, University Students

Introduction

The goal of developing one's speaking abilities is to communicate one's ideas, thoughts, and feelings to others through spoken word. Saldaria et al. (2019) stated, "Speaking is one manifestation of oral communication that provides information through words spoken through a spoken tool." When a person speaks, they go through a mental process that allows them to convey their thoughts and feelings to an audience. In line with the explanation above, Munroe

(2023) added that the process of thinking is a process of speaking. This explains that the variables of developing thought based on underlying experience are intrinsically linked to the act of speaking.

It takes more than knowing what to say to communicate effectively; delivering a speech is complex. Speaking is an efficient talent that requires lots of practice. Learning to talk about the language is emphasized before reading and writing so children can communicate effectively (Septiani & Syaodih, 2021). To explain their meaning, the students will need to use oral language. Therefore, speaking is the most efficient approach to communicating ideas, whether people want to ask a question or provide an explanation. The ability to express oneself orally frees the individual to explore new avenues of expression concerning any issue or experience. It is a significant asset to one's reputation to communicate fluently and effectively in a foreign language with correct tone and pronunciation (Derakhshan et al., 2016). The capacity to communicate fluently in a target language is a sign of a well-developed set of skills in that language.

Various learning resources can be used to promote students' speaking performance, one of which is by using TED talks. A TED talk is a brief presentation on tech, infotainment, or innovation supported by TED, a non-profit organization that collaborates with professionals to promote the global dissemination of ideas. According to Nursafira, (2020), "TED Talks is a video-based conference where speakers present their big ideas, well-formed in under 18 minutes, covering various topics such as science, business, global issues, and education". This definition describes TED talks as a potentially valuable instructional resource due to the diverse information provided. As Fitria (2022) stated, "TED Talks are fantastic resources to utilize since they include authentic, informative, and inspirational talks and videos for teaching and learning."

In recent decades, studies on the use of TED talks have become one of the popular topics in language teaching, especially in speaking. The results of those studies showed that the use of TED Talks significantly affected students' speaking skills (Alghmadi, 2024; Aprilia, 2022; Bedaiwy, 2022; Jin, 2023; M. Liu, 2021; Mıcık & Rızaoğlu, 2024; Nawaz et al., 2021; Sailun & Idayani, 2018; Salem, 2019; Stognieva, 2020; Tilwani et al., 2022). Nonetheless, the results of previous studies need to be re-reviewed to obtain comprehensive understandings and accurate conclusions. One robust method that can be used to synthesize and evaluate the existing evidence is a meta-analysis.

"Meta-analysis is a quantitative, formal, epidemiological study design used to systematically assess previous research studies to derive conclusions about that body of research" (Haidich, 2014). A meta-analysis is a form of research that uses other existing data studies. Therefore, meta-analysis becomes a quantitative research method that analyzes quantitative data to accept or reject the hypotheses put forward in it. In the process, meta-analysis allows for combining different results considering the relative sample and effect sizes. The results of this review are called accurate, given the broad and centralized range of analysis.

So far, no meta-analytic study has been conducted specifically on the effect of using TED talks on speaking ability at the university level. While there have been several previous studies

related to the study of TED talks, these studies used a qualitative approach in both data collection and processing. One such study by Fitria (2022) employed descriptive qualitative methods to analyze data related to TED talks. The study reviewed a total of 14 articles from both national and international levels, with six articles focusing on the impact of TED talks on speaking skills, five on listening skills, and three on writing skills. The results indicated that TED Talks could help students learn various skills, including speaking, reading, listening, and writing, and could be a complementary resource for their language learning.

Similarly, a Nursafira (2020) study adopted a qualitative research methodology. Data was collected from relevant paper-based articles that explored using TED Talks as a learning medium to improve speaking skills. The research findings suggested that TED Talks enhanced speaking proficiency among EFL learners and served as a motivational tool for both teachers and students, fostering a spirit of inspiration and insight.

While these qualitative reviews provide valuable insights, a quantitative synthesis of the empirical evidence through meta-analysis is needed to draw more robust conclusions about the effectiveness of using TED Talks for improving speaking skills in university students. The current study aims to fill this gap by conducting a meta-analysis of experimental studies investigating the impact of TED Talks on university students' speaking skill competency. Specifically, the objectives of this meta-analysis are: 1) To determine the effectiveness of using TED Talks on university students' speaking competency and 2) To examine whether the effectiveness of TED Talks varies across different countries where the studies were conducted. By synthesizing effect sizes across multiple primary studies, this meta-analysis can provide an overall estimate of the effectiveness of this instructional approach and identify potential moderators, such as countries, that may influence its impact.

TED Talks as Learning Resources

TED Talks have become valuable resources in language education due to their engaging and authentic content. These multimedia presentations offer opportunities for learners to develop critical thinking, cultural awareness, and language skills. Researchers have found that incorporating TED Talks into English classrooms promotes active learning and improves comprehension, vocabulary acquisition, note-taking, and speaking abilities (Fitria, 2022; Nadiia, 2023). Learners benefit from exposure to diverse topics, accents, and speech styles delivered by native and non-native speakers (García-Sánchez, 2021), which provides real-world language exposure and enhances their understanding of vocabulary, pronunciation, and cultural references.

Studies have shown that using TED Talks as supplementary materials in language classrooms can enhance learners' motivation, vocabulary acquisition, and listening comprehension (Puspita & Amelia, 2020). The academic nature of TED Talks, with high coverage of the Academic Spoken Word List (ASWL) at approximately 90%, makes them suitable for academic listening and helps learners acquire high-frequency academic spoken vocabulary (Liu & Chen, 2019). The engaging and thought-provoking content of TED Talks can stimulate learners' interest and curiosity, increasing their motivation to learn. Additionally,

the diverse topics expose learners to a wide range of vocabulary and language structures, facilitating vocabulary acquisition and language development.

The Effect of TED Talks on Students' Speaking Skills

Developing speaking competencies is crucial to language learning, as it enables effective communication and self-expression. According to Goh & Burns (2012), speaking competence encompasses various components, including fluency, accuracy, pronunciation, vocabulary, and pragmatic knowledge. Researchers have investigated the impact of TED Talks on specific speaking competencies, such as improving fluency, enhancing pronunciation (Karimah et al., 2022), and increasing vocabulary knowledge (Nguyen & Boers, 2019).

Numerous studies have focused on the effectiveness of TED Talks in improving students' speaking skills at various educational levels. A study by Syafrizal & Syamsun (2023) found that using TED Talks in English classes improves speaking skills, enhances self-esteem, and reduces anxiety for students. Similarly, Aziz & Ngadiron (2019) reported that using English videos from TED Talks improves students' proficiency level in speaking compared to traditional teaching methods. These studies highlight the potential of TED Talks for enhancing speaking proficiency in English as a Foreign Language (EFL) contexts.

Using authentic and engaging materials like TED Talks allows learners to practice speaking skills contextualized, exposing them to diverse accents, vocabulary, and real-world language use. By incorporating TED Talks into language classrooms, educators can create opportunities for learners to develop specific speaking competencies while fostering motivation and reducing anxiety associated with speaking activities.

Research Method

This meta-analysis systematically synthesized results from prior experimental studies investigating the effect of using TED Talks on university students' speaking skill competency. A meta-analytic approach was employed, combining effect sizes across multiple primary studies to calculate an overall effect estimate (Borenstein et al., 2009). The meta-analysis process involved three key stages: literature selection, coding of study details, and calculation of effect sizes (Rudneva, 2023).

A comprehensive literature search was conducted using Publish or Perish 8 to identify relevant studies published between 2018 and 2024. The initial search yielded 200 articles. These articles were then carefully screened using the following inclusion criteria: (1) experimental design with a TED Talks group and control group, (2) reporting of quantitative data (means and standard deviations) necessary for effect size calculation, (3) conducted at the university level focusing on TED Talks to improve speaking skills, and (4) published as an open-access peer-reviewed journal article.

To ensure a high-quality, focused meta-analysis, studies were excluded if: (1) the full text did not address the research question or intervention of interest based on detailed examination, (2) the full text was unavailable despite reasonable efforts, (3) the study was a

duplicate, (4) the abstract indicated an irrelevant population, intervention or outcome, (5) the study was non-empirical (e.g. review, commentary), or (6) essential data for effect size calculation (means, standard deviations, sample sizes) was missing. After applying the inclusion and exclusion criteria, 11 articles containing 16 primary studies were selected for the meta-analysis.

A standardized data extraction form was used to code relevant details from each included study: author(s), publication year, country, sample size, mean speaking scores, and standard deviations for the experimental and control groups. The researcher coded all the studies individually. The effect size data from the individual studies were synthesized using the openMEE software (Wallace et al., 2012). Effect sizes were calculated as the standardized mean difference (Hedges' g) between the experimental and control groups. After getting the effect size, it is categorized based on Table 1.

Table 1. Effect Size Category Based on Cohen

No	Effect Size	Category
1	< 0.20	Ignore
2	0.20 - 0.50	Low
3	0.51 - 0.80	Moderate
4	0.81 - 1.30	High
5	> 1.30	Very High

A random-effects model was used to calculate the overall summary effect estimate and 95% confidence interval, as this model accounts for potential heterogeneity across studies (Borenstein et al., 2010). Heterogeneity was assessed statistically using the Q statistic and I² index.

Publication bias, which can threaten validity, was evaluated using funnel plots and Rosenthal's Fail-Safe N (FSN). If asymmetry was detected in the funnel plots, suggesting potential publication bias, the FSN value was calculated and compared against the threshold of $5k+10$ (where k is the number of included studies) (Papageorgiou et al., 2015). FSN values exceeding this threshold indicate the results are robust and likely free from publication bias.

Results

Overall Effectiveness of TED Talks on University Students' Speaking Competency

The meta-analysis synthesized data from 16 prior studies that examined the effect of using TED Talks on university students' speaking skills. The effect sizes from the individual studies are shown in Table 2:

Table 2. Effect Size of Each Study

No	Code	Authors	Effect Size	Category
1	S1	Sailun & Idayani (2018)	0.848	High
2	S2	Salem - Study 1 (2019)	5.687	Very High
3	S3	Salem - Study 2 (2019)	-3.392	Ignore
4	S4	Stognieva (2020)	1.138	High
5	S5	Liu (2021)	0.072	Ignore
6	S6	Nawaz et al. 2021)	1.188	High
7	S7	Aprilia (2021)	0.946	High
8	S8	Tilwani et al. - Study 1 (2022)	1.763	Very High
9	S9	Tilwani et al. - Study 2 (2022)	2.139	Very High
10	S10	Bedaiwy (2022)	14.687	Very High
11	S11	Jin (2022)	0.680	Moderate
12	S12	Alghmadi (2022)	2.005	Very High
13	S13	Micik & Rizaoglu - Study 1 (2024)	0.342	Low
14	S14	Micik & Rizaoglu - Study 2 (2024)	-0.027	Ignore
15	S15	Micik & Rizaoglu - Study 3 (2024)	0.462	Low
16	S16	Micik & Rizaoglu - Study 4 (2024)	0.480	Low

The effect sizes varied considerably across studies, with some, like S10 (14.687) and S2 (5.687), showing enormous positive values, indicating a substantial improvement in speaking skills with TED Talks. In contrast, studies like S13 (0.342), S15 (0.462), and S16 (0.480) displayed smaller positive values suggesting more modest improvements. Study S3 (-3.392) even had a significant negative effect size.

To provide a more precise overview of the distribution of effect sizes, the researchers categorized the effects into descriptive levels based on Cohen's guidelines, as shown in Figure 1. Of the 16 studies, 9 found positive impacts ranging from high to very high categories. Specifically, five studies (S2, S8, S9, S10, and S12) were in the "very high" category, indicating effect sizes greater than 1.30, which are considered substantial. Four studies (S1, S4, S6, and S7) were in the "high" category, with effect sizes between 0.81 and 1.30, suggesting a considerable positive impact. One study (S11) was in the "moderate" category, with an effect size between 0.51 and 0.80, indicating a moderate positive effect. Three studies (S13, S15, and S16) were in the "low" category, with effect sizes between 0.20 and 0.50, suggesting a small positive impact. However, three studies (S3, S5, and S14) were categorized as having negligible or negative effects labeled as "ignore," with effect sizes below 0.20 or negative values.

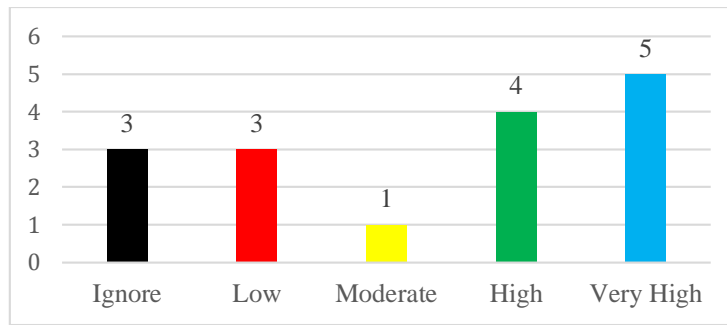


Figure 1. Studies Effect Size Based on Categories

The overall effect was calculated by combining all 16 studies, as shown in Table 3:

Table 3. Overall Effect Size

Estimate	Lower bound	Upper bound	Std. error	p-Value
1.521	0.696	2.346	0.421	< 0.001

According to Cohen's guidelines, the mean effect size of 1.521 is considered a significant positive effect, suggesting that, on average, students using TED Talks scored 1.521 standard deviations higher on speaking measures compared to control groups not utilizing TED Talks. This pooled effect was statistically significant at $p < 0.001$, indicating strong evidence that using TED Talks positively impacted university students' speaking competency across the included studies.

In addition, the heterogeneity assessments revealed substantial variability across the different study effects, as shown in Table 4. The Q statistic had a significant value of 590.425 with 15 degrees of freedom, and this heterogeneity was highly statistically significant ($p < 0.001$). Furthermore, the I² index was 97.459%, indicating that 97.5% of the total variation across study effects was due to absolute heterogeneity between studies rather than chance variation.

Table 4. Heterogeneity Statistics

τ^2	Q(df=15)	Het. p-Value	I ²
2.684	590.425	< 0.001	97.459

This high degree of heterogeneity suggests that the actual effect sizes varied considerably across the included studies, likely due to differences in study characteristics, populations, or implementation of the TED Talk intervention. Such substantial heterogeneity indicates that the overall effect size should be interpreted cautiously, as it may not accurately represent the effectiveness of TED Talks in all contexts. This high degree of heterogeneity is visually depicted in the forest plot (Figure 2), with some studies showing substantial positive effects of TED Talks on speaking skills. In contrast, others had effects close to zero or even adverse effects.

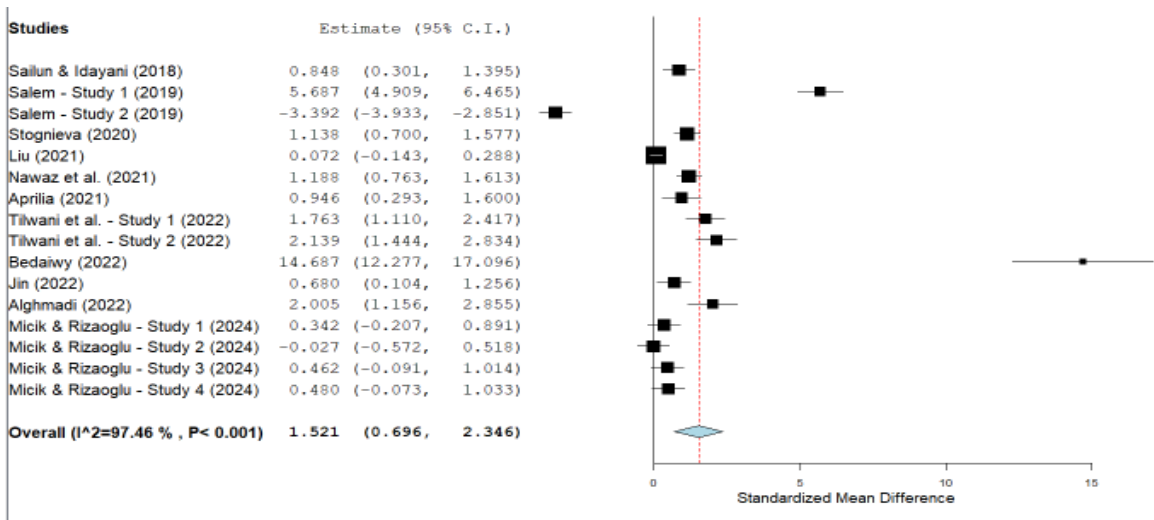


Figure 2. Forest Plot of Study Effect Sizes

Visual inspection of the funnel plot in Figure 3 suggests some asymmetry, with smaller studies (represented by points further from the vertical line) showing more significant effects than more precise (larger) studies. This asymmetry could potentially indicate publication bias, where studies with statistically significant results (positive or negative) are more likely to be published than null findings.

To statistically evaluate publication bias, Rosenthal's Fail-safe N (FSN) analysis was conducted using the OpenMEE software with the data from the 16 included studies. The FSN value was calculated to be 1005. Here, k represents the number of studies used in the meta-analysis ($k = 16$). Rosenthal's rule suggests that an FSN value greater than $5k + 10$ indicates a low risk of publication bias. In this case, $5(16) + 10 = 90$. Since the FSN value (1005) is substantially more significant than the threshold (90), the results suggest no firm evidence of publication bias in this meta-analysis.

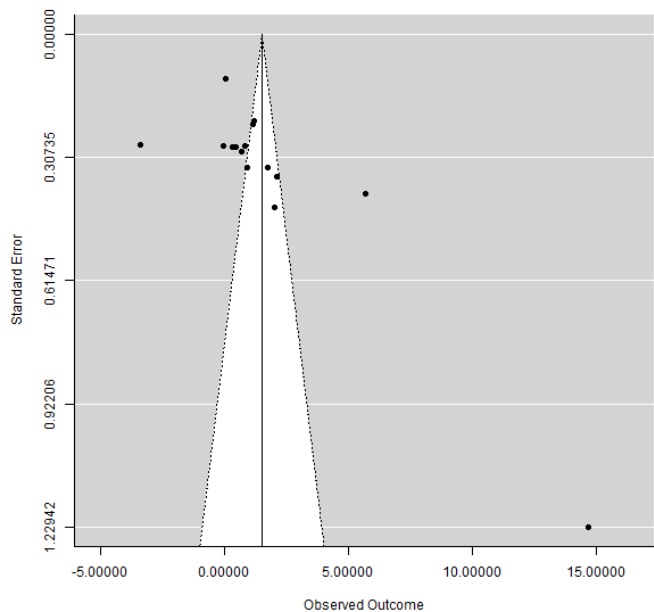


Figure 3. Funnel Plot for Publication Bias Assessment

The Effectiveness of TED Talks in Terms of Implementing Countries

To investigate if the effectiveness of TED Talks varied across different national contexts, the researchers grouped and analyzed the effect sizes by the country where each study took place (Table 5).

Table 5. Effect Size of TED Talks Based on Countries

No	Country	Article Code	Effect Size	Category	Standard Error	p-Val
1	China	S5	0.072	Ignore	0.11	NA
2	Egypt	S2, S3, S10	5.579	Very High	4.187	0.183
3	Indonesia	S1, S7	0.889	High	0.214	< 0.001
4	South Korea	S11	0.680	Moderate	0.294	NA
5	Pakistan	S6	1.188	High	0.217	NA
6	Rusia	S4	1.138	High	0.224	NA
7	Saudi Arabia	S8, S9, S12	1.955	Very High	0.212	<0.001
8	Turkey	S13, S14, S15, S16	0.312	Low	0.14	0.026

In terms of effect sizes, the most significant positive effects were found in Egypt (5.579) and Saudi Arabia (1.955), both categorized as "very high" improvements in speaking ability. This indicates that students in these countries experienced substantial enhancements in their speaking skills when using TED Talks, with effect sizes greater than 1.95 and 5.58 standard deviations, respectively, compared to control groups not utilizing TED Talks. Similarly, Indonesia (0.889), Pakistan (1.188), and Russia (1.138) also demonstrated high positive effects, suggesting TED Talks led to improvements in speaking competency between 0.89 to 1.19 standard deviations in these national contexts across Asia and Eastern Europe.

South Korea had a moderate positive effect size of 0.680, indicating an improvement of about 0.68 standard deviations when using TED Talks. Turkey's effect was lower at 0.312 but still reflected a positive impact equivalent to a 0.31 standard deviation gain. China was the only country with a negligible effect size of 0.072, suggesting no substantive impact (less than 0.08 standard deviations) of using TED Talks on Chinese university students' speaking skills based on the study included.

Regarding statistical significance based on p-values, the positive effects were statistically significant ($p < 0.001$) for Indonesia and Saudi Arabia. This means there is strong evidence that the observed enhancements of 0.89 and 1.96 standard deviations in these countries were reliable and unlikely due to chance. However, Egypt's significant effect of 5.579 standard deviations did not reach statistical significance at $p = 0.183$. This lack of significance may be due to having only a limited number of studies from Egypt, reducing the statistical power to detect such a large effect as statistically significant. For Pakistan, Russia, and South Korea, p-values were not provided to evaluate statistical significance. Turkey's lower positive effect of 0.312 standard deviations was statistically significant ($p = 0.026$).

The data suggests that while TED Talks tended to have positive effects across countries, the degree of effectiveness varied. Egypt and Saudi Arabia showed significant gains over 1.95 standard deviations, followed by high impacts around 1 standard deviation in Indonesia, Pakistan, and Russia. South Korea and Turkey saw more modest positive impacts, around 0.3-0.7 standard deviations. China was the only national context with negligible effects based on this study.

Discussion

The findings of this meta-analysis demonstrate the overall positive and statistically significant effect of using TED Talks to improve university students' speaking skills. The pooled effect size of 1.521 is considered significant (Plonsky & Oswald, 2014), indicating that students who used TED Talks scored substantially higher on speaking measures than control groups. This result corroborates previous individual studies (Alghmadi, 2024; Aprilia, 2022; Bedaiwy, 2022; Nawaz et al., 2021; Sailun & Idayani, 2018; Salem, 2019; Stognieva, 2020; Tilwani et al., 2022) that reported significant speaking gains with TED Talk integration.

However, the high degree of heterogeneity observed ($I^2 = 97.5\%$) suggests that the effectiveness of TED Talks varied considerably across the different studies included in the analysis. Some studies found extensive positive effects (Bedaiwy, 2022; Salem, 2019; Tilwani et al., 2022), while others reported more modest impacts or even negligible/negative effects (M. Liu, 2021; Micık & Rızaoğlu, 2024). This variability could stem from differences in factors such as instructional design and content selections, supportive learning environment, proficiency levels, learner differences, or the specific way TED Talks were integrated into the curriculum across different contexts.

When examining the effects by country, the meta-analysis revealed that TED Talks were most effective in improving speaking skills for university students in Egypt and Saudi Arabia, both showing substantial positive effects categorized as "very high." This finding aligns with previous studies highlighting the benefits of using authentic multimedia resources like TED Talks for language learning in Arab contexts (Aljohani, 2019; Harb, 2018; Shawqy et al., 2022).

Similarly, TED Talks demonstrated highly positive effects in countries like Indonesia, Pakistan, and Russia. These results are encouraging, as they suggest that using TED Talks can be a practical pedagogical approach for enhancing speaking competencies across diverse cultural and linguistic contexts. The authentic, engaging nature of TED Talks may help motivate and involve students in active listening and speaking practice (Al-Jarf, 2021; Chotimah & Handayani, 2020; Takaesu, 2014).

Interestingly, China was the only country with a negligible effect size, indicating no substantial impact of using TED Talks on Chinese postgraduate students' speaking abilities based on the included study. This finding contrasts with previous research reporting the positive effects of TED Talks in Chinese EFL contexts (Cuong & Hang, 2024; Wang, 2018;

Wu, 2020). Further investigation into the specific instructional approaches and learner characteristics in the China study may shed light on this discrepancy.

Notably, while the overall effect and most country-level effects were positive, some individual studies still found negligible or negative impacts of TED Talks on speaking skills (Mıcık & Rızaoğlu, 2024; Salem, 2019). These findings underscore the importance of carefully considering learner needs, proficiency levels, and instructional design when integrating TED Talks into language classrooms (Aziz & Ngadiron, 2019; Hidayati & Suharyadi, 2023; Stognieva, 2019).

A limitation of the present meta-analysis is the relatively small number of studies included, particularly from certain countries. For instance, the significant effect size observed for Egypt was based on only three studies, which may have reduced the statistical power to detect the effect as substantial. Future meta-analyses with a larger pool of primary studies could yield more robust and generalizable findings. Additionally, the current meta-analysis focused specifically on the impact of TED Talks on speaking skills at the university level. However, it would be valuable to extend the investigation to other educational levels (e.g., secondary, adult learners) and language skills (e.g., listening, reading, writing) to understand the broader applicability of TED Talks as a pedagogical tool (Brinton, 2014; Nezhyva, 2023; Williyan, 2019).

Future research could also explore the potential moderating effects of factors such as student characteristics (e.g., motivation, proficiency levels), instructor variables (e.g., teaching experience, pedagogical approaches), or specific TED Talk features (e.g., topic, length, speaker characteristics) on the effectiveness of TED Talks for developing speaking skills. Such insights could inform more targeted and optimized implementations of TED Talks in language classrooms.

Conclusion

This meta-analysis provides robust quantitative evidence for the effectiveness of using TED Talks to enhance university students' speaking competency across diverse national contexts. While substantial heterogeneity was observed, indicating variability in the degree of impact, the significant positive pooled effect size of 1.521 suggests that TED Talks can improve speaking skills when integrated thoughtfully into language curricula. The findings highlight TED Talks as a promising pedagogical approach in Egypt, Saudi Arabia, Indonesia, Pakistan, and Russia. However, negligible or adverse effects in some individual studies underscore the need for careful consideration of factors like learner characteristics, proficiency levels, and instructional design to optimize the benefits of TED Talks. Future research should explore potential moderators influencing TED Talk effectiveness, extend analyses to other skills and educational levels, and seek to bolster findings with a larger pool of primary studies. Nonetheless, this meta-analytic synthesis offers encouraging evidence supporting engaging, authentic TED Talk resources to foster speaking development among university-level language learners globally.

Declaration of conflicting interest

The authors declare that there is no conflict of interest in this work.

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