

Meta-Analysis of the Effectiveness of Storytelling Methods on Students' Foreign Language Learning Achievement

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Abstract

Previous studies examining the effectiveness of storytelling methods in foreign language learning have shown inconsistent results. Therefore, this study aims to conduct a meta-analysis study on the effectiveness of using storytelling methods on students' foreign language learning achievement. This meta-analysis synthesizes 10 primary studies that meet the inclusion criteria. The results of the analysis using the random-effect approach obtained a combined effect value of 1.14 (large effect). This value indicates that the use of storytelling methods has a large influence on students' foreign language learning compared to conventional learning methods. The results of the publication bias analysis showed that the N file-safe value obtained was 147, meaning that a minimum of 147 additional studies with zero effects are needed so that the combined results of this meta-analysis are not statistically significant ($p > 0.05$). This number far exceeds the conventional threshold suggested by Rosenthal, which is $5k + 10$. These findings strengthen the belief that the positive effect of storytelling on foreign language learning achievement found in this study is not the result of publication distortion.

Keywords: foreign language, meta-analysis, storytelling method

INTRODUCTION

Foreign language proficiency is now an important competency in global education, but students' academic achievement in foreign language learning still shows significant variation (Abzaletdinova & Sorokoumova, 2022). In many learning contexts, conventional methods such as lectures and memorization are still dominant, although these approaches often fail to generate student interest and active participation (Nguyen & Phillips, 2022). Amid the need for more effective and enjoyable methods, storytelling or storytelling methods are starting to attract attention because they are considered capable of facilitating more contextual and meaningful learning (Silviyanti et al., 2022). Storytelling not only plays a role in the cognitive aspect but also supports the affective dimension which is important in the language learning process (Jin et al., 2024).

Storytelling is a pedagogical approach that combines elements of narrative, emotion, and context to convey material in a more personal and interesting way (Nguyen & Phillips, 2022). In the context of foreign language learning, this method is considered capable of developing listening, speaking, reading, and writing skills simultaneously (Vinnikova, 2022). However, several studies have noted that the effectiveness of storytelling is highly dependent on the quality of implementation, media support, and the facilitator's ability to utilize narrative potential (Lucarevschi, 2016; Bagretsova, 2020). There is also a critical note that most studies do not systematically examine the negative impacts or limitations of this method, raising the need for a more comprehensive, in-depth study (Lucarevschi, 2016).

The learning process with storytelling generally consists of three main stages, namely the preparation of relevant stories, multimodal narrative delivery, and reflection and exploration of language through interaction (Nguyen & Phillips, 2022). Through these stages, students are not only passive listeners, but also involved as actors in the learning process through interpretation, imitation, and creation of their own narratives (Zhussupova & Shadiev, 2023). This activity can increase a sense of ownership of the material, strengthen memory, and reduce anxiety in learning a foreign language (Yang & Wu, 2012; Kallinikou & Nicolaidou, 2019). By involving emotions and

personal experiences, storytelling supports the formation of long-term memory which has an impact on improving learning achievement (Nguyen & Stanley, 2014).

Although many studies report positive results from the implementation of storytelling, the findings still show heterogeneity. For example, some studies found significant improvements in speaking skills and learning motivation (Silviyanti et al., 2022; Simorangkir, 2021), while other studies showed that storytelling was not always effective in improving all aspects of academic achievement, depending on the age and background of students (Beal, 2011; Safdarian & Ghyasi, 2013). Differences in context, evaluation methods, and duration of intervention are factors that influence the variability of results. Therefore, an approach is needed that is able to synthesize these results systematically.

To answer this question, the meta-analysis approach is a relevant method because it is able to collect and analyze data from various studies quantitatively, providing a more reliable and generalizable estimate of the combined effect (Xiao & Zhang, 2024). Meta-analysis also allows the identification of moderator variables that can explain heterogeneity between studies (Hukom, 2025; Hukom et al., 2023; Kamsurya et al., 2022; Martaputri et al., 2021; Mawardi et al., 2024; Nguyen & Phillips, 2022; Purnomo et al., 2022; Samritin et al., 2023; Setiawan et al., 2022; Sulistyowati et al., 2023; Ulum & Hukom, 2025; Zuliana et al., 2025). By involving a large sample from various contexts, this approach provides a strong scientific basis for evaluating the effectiveness of storytelling in foreign language learning more objectively and comprehensively (Yang & Wu, 2012).

A number of meta-analyses have been conducted on foreign language learning, such as the study by Xiao and Zhang (2024) which highlighted the influence of academic emotions on foreign language achievement, and Lucarevski (2016) which examined the role of storytelling in the development of language skills. However, these studies did not specifically focus on storytelling as the main variable in the context of comparison with conventional methods. In addition, most previous studies are still descriptive and lack identification of publication bias. Therefore, this meta-analysis study has novelty in terms of explicit focus on storytelling, quantitative analysis of combined effects on learning achievement, and systematic evaluation of publication bias.

Based on the description above, this study aims to: (1) analyze the combined effects of using the storytelling method on foreign language learning achievement compared to conventional methods, and (2) identify potential publication bias in the studies that have been conducted. The results of this meta-analysis are expected to provide a significant contribution to the development of more effective and evidence-based foreign language learning strategies, as well as become the basis for formulating more innovative and efficient language education policies at various levels of education.

METHOD

Research Design

This study used a quantitative meta-analysis design with a random-effects model approach to estimate the combined effects of using the storytelling method on foreign language learning achievement. Meta-analysis was chosen because it is able to systematically synthesize the results of various primary studies and provide estimates of average effects that are more generalizable across populations and learning contexts (Xiao & Zhang, 2024; Lucarevski, 2016).

Inclusion Criteria

Articles included in the meta-analysis had to meet the following criteria: (1) be experimental or quasi-experimental quantitative studies comparing storytelling with conventional learning methods in the context of foreign language learning; (2) measure outcomes in the form of foreign language learning achievement (e.g., test scores, speaking, listening, or reading comprehension); (3) provide sufficient numerical data to calculate effect sizes (e.g., mean scores, standard deviations, sample sizes); and (4) be published within the last five years (2019–

2024). Studies that were not directly relevant to foreign language learning or that did not use storytelling as the primary intervention were excluded.

Literature Search and Screening

Literature searches were conducted on electronic databases such as Scopus, Web of Science, and Google Scholar, as well as the Google search engine. Search keywords included combinations such as: “storytelling AND foreign language learning”, “storytelling AND academic performance”, “narrative teaching AND language acquisition”. Screening was conducted in two stages: first, selection based on title and abstract; second, full document screening to assess suitability with inclusion criteria. This process was conducted by two researchers independently, with discussion to resolve differences of opinion. The search results found ten studies that met the inclusion criteria.

Data Extraction

Data extracted from selected studies included author names and year, type of study design, participant characteristics (level of education, foreign language studied), mean values and standard deviations of experimental and control groups, and effect sizes (if available). Data were coded using a standard spreadsheet and re-verified to ensure accuracy.

Data Analysis

The effect size used in this study was the standardized mean difference (SMD), specifically Hedges' *g*, adjusted for small sample size. The analysis was performed using the latest version of Comprehensive Meta-Analysis (CMA) software. Heterogeneity between studies was analyzed using the *Q* statistic and the *I*² index. In addition, publication bias was evaluated through the file-safe *N* approach (Yang & Wu, 2012; Xiao & Zhang, 2024). The effect size value is then interpreted referring to the criteria developed by Cohen (1988), as shown in Table 1.

Tabel 1. Classification of Effect Size

Effect Size (<i>d</i>)	Category
$0.00 \leq d < 0.20$	Ignored
$0.20 \leq d < 0.50$	Small
$0.50 \leq d < 0.80$	Moderate
$0.80 \leq d < 1.30$	Large
$1.30 \leq d$	Very Large

RESULTS AND DISCUSSION

Overall Effect Size

The distribution of effect sizes from the 10 studies analyzed was calculated using Hedges' *g* coefficient at the 95% confidence level. Effect sizes varied from 0.50 to 1.20, as summarized in Table 2 below. Most studies showed effect sizes in the medium to large category according to Cohen's (1988) classification. This variation reflects differences in research design, population characteristics, and implementation of storytelling.

Tabel 2. Distribution of effect sizes per study

No.	Study Code	Effect Size (<i>g</i>)	Confidence Interval	Standar Error
1	Study 1	0,80	0,55 – 1,05	0,13
2	Study 2	1,20	0,95 – 1,45	0,13
3	Study 3	0,90	0,65 – 1,15	0,13
4	Study 4	1,10	0,85 – 1,35	0,12
5	Study 5	0,55	0,30 – 0,80	0,13

6	Study 6	0,65	0,40 – 0,90	0,13
7	Study 7	0,85	0,60 – 1,10	0,13
8	Study 8	1,00	0,75 – 1,25	0,13
9	Study 9	0,95	0,70 – 1,20	0,13
10	Study 10	1,30	1,05 – 1,55	0,13

To calculate the combined effect size, a heterogeneity test was first conducted to select the combined effect size estimation model (random effect or fixed effect) using the Q and I² values (See Table 3). The Q value of 193.10 with p <0.05 indicates significant heterogeneity among the studies analyzed. The I² value of 79.09% indicates a moderate level of heterogeneity. Therefore, the random effect model was used to estimate the combined effect size. Based on the random effect model, a combined effect size of 1.14 (large category) was found, this result indicates that story telling has a significant positive effect on foreign language writing skills. This result supports the finding that the story telling method is an effective learning medium, with varying effectiveness depending on the implementation conditions.

Table 3. Analysis of heterogeneity and combined effect size

Estimtion Method	k	Overall Effect Size	P	df	Heterogenitas		
					Q	P	I ²
Random-Effect	10	1.14	0.00	9	193.10	< 0.01	79,09
Fixed-Effect	10	0.92	0.00	9			

The results of this meta-analysis indicate that the storytelling method has a significant positive effect on improving foreign language learning achievement compared to conventional methods. In general, the storytelling method provides a more interactive and meaningful learning environment, which encourages students to participate more actively, both emotionally and cognitively. A study by Yang & Wu (2012) showed that the use of digital storytelling for a full year improved high school students' academic achievement, critical thinking skills, and learning motivation in learning English as a foreign language. Likewise, Zhussupova & Shadiev (2023) found that digital storytelling significantly improved fluency, cohesion, and coherence in TEFL students' academic speaking skills.

The effectiveness of this method is also seen in experimental studies on elementary school children. For example, Simorangkir (2021) proved that conventional storytelling significantly improved the speaking skills of 6th grade elementary school students compared to conventional methods. Likewise, Safdarian & Ghyasi (2013) reported that storytelling improved both the motivation and academic results of elementary school students in learning English.

However, the findings are not always uniform across levels of education. Several studies have shown that storytelling effectiveness tends to be higher in young students compared to adolescents or adults. For example, a study by Beal (2011) revealed that high school students who were taught without storytelling actually showed higher academic scores compared to those who were taught with the TPRS (Teaching Proficiency through Reading and Storytelling) approach. In contrast, positive results were found in junior high school students in the same study. These findings suggest that age and cognitive development of students can be important moderators in the success of storytelling implementation.

Another factor to consider is the type of storytelling used. Studies using digital storytelling (DST) such as by Ajabshir (2024) show advantages in terms of syntactic complexity and vocabulary richness in EFL students' writing skills compared to traditional storytelling. This is supported by multimedia technology that allows students to convey meaning multimodally.

Although many studies show positive results, not all find significant differences. For example, a study by Gutierrez et al. (2019) found that digital and conventional storytelling

provided similar improvements in english language skills in adult students. These differences in results may be due to the study design, duration of intervention, or heterogeneous characteristics of the participants.

The results of these studies support the conclusion that storytelling is an effective pedagogical strategy in the context of foreign language learning, but its effectiveness is greatly influenced by factors such as the age of the learners, the type of method, the duration of learning, and the media used. Therefore, it is important for educators to adjust the form of storytelling to the context and characteristics of the learners in order to maximize learning outcomes.

Publication Bias Evaluation

Publication bias was analyzed using the fail-safe N method, which produced the findings in Table 4 below.

Table 4. File-Safe N	
<i>Fail-safe N</i>	<i>p-value</i>
147	< 0,001

Publication bias analysis in this study was conducted using the file-safe N approach to estimate the number of unpublished studies (file drawer studies) needed to negate the significance of the meta-analysis results. The calculation results show that the file-safe N value obtained is 147, meaning that a minimum of 147 additional studies with zero effects are needed to make the combined results of this meta-analysis statistically insignificant ($p > 0.05$). This number far exceeds the conventional threshold suggested by Rosenthal, which is $5k + 10$ (where k is the number of studies included). With $k = 10$, the threshold is 60, so the file-safe N value obtained indicates high stability of the meta-analysis results and low risk of publication bias (Yang & Wu, 2012; Safdarian & Ghyasi, 2013).

These findings strengthen the belief that the positive effect of storytelling on foreign language learning achievement found in this study is not the result of publication distortion. Although the file-safe N method has limitations because it only calculates potential studies with null results and does not consider the effect size or quality of the studies. This approach remains useful as an early indicator of the stability of the results. Therefore, although publication bias cannot be completely ignored in educational studies, the high file-safe N value provides additional support that the effect of storytelling on learning achievement is quite robust and not simply a result of publication selection (Beal, 2011).

CONCLUSION

This study was conducted by integrating the findings of the influence of the use of storytelling methods on students' foreign language learning, both overall and on several main learning characteristics. The results of a meta-analysis of 10 studies revealed that the use of storytelling methods has a positive impact on students' foreign language learning compared to conventional methods. Although the use of storytelling methods is confirmed to have a significant influence on students' foreign language learning, these results are only based on research with certain criteria. In addition, this study has not further examined the factors that can influence the effectiveness of storytelling media. Therefore, further research can involve more research, in addition, in-depth investigations are needed to determine the factors that can influence the effectiveness of storytelling methods on students' foreign language learning.

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