

## Effectiveness of Flipped Classroom Model on EFL Students' English Proficiency: A Meta-Analysis Study

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**Abstract: Effectiveness of Flipped Classroom Model on Students' English Language Ability: A Meta-Analysis Study.** Various studies have attempted to examine the impact of using flipped classrooms on students' English language skills at various levels of education in Indonesia. However, the conclusions of these studies are heterogeneous. **Objective:** This study aims to analyze the effectiveness of flipped classrooms in English learning compared to traditional models. **Method:** The research method used is meta-analysis. A total of 20 primary studies published between 2019-2024 were included in this meta-analysis. **Findings:** The result of the combined effect size analysis using the random-effect estimation model is  $g = 0.80$  ( $p < 0.05$ ). This value indicates that flipped classrooms have a large and significant impact on students' English skills compared to traditional models. In addition, the analysis of moderator variables shows that the effectiveness of flipped classrooms on students' English skills differs based on educational level ( $Q_b = 16.46$ ;  $p < 0.05$ ), experimental class capacity ( $Q_b = 26.14$ ;  $p < 0.05$ ), and type of ability measured ( $Q_b = 76.11$ ;  $p < 0.05$ ). **Conclusion:** The findings confirm that flipped classrooms have a significant impact on students' English language skills compared to traditional models. This effectiveness depends on the context, such as educational level, class capacity, and types of skills being measured. Therefore, these results highlight the need to adjust the instructional design of flipped classrooms based on student characteristics, class size, and learning focus. These findings provide direction for educators to be more careful in designing flipped classroom-based learning and encourage researchers to develop further studies that consider contextual variables to produce more effective implementations in various educational settings.

**Keywords:** english, flipped classroom model, meta-analysis, effect size.

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### ■ INTRODUCTION

In today's digital era, learning models keep evolving to address the increasing diverse needs of students. One approach that has received widespread attention is the flipped classroom model. The flipped classroom is a learning model that reverses the traditional role in education, where students learn new knowledge at home and then use class time to collaborate, discuss,

and apply that knowledge (Nouri, 2016; Sun, 2017). The flipped classroom is rooted in a constructivist approach that emphasizes that meaningful learning occurs when learners actively construct their knowledge through learning experiences and social interactions (Zainuddin & Halili, 2016; Zhai et al., 2025; Ziang et al., 2022). In line with the Interaction Hypothesis, which states that second language acquisition is

facilitated through meaningful interactions that allow for negotiation of meaning and feedback (Loewen & Sato, 2018). In addition, this model also supports the Output Hypothesis, which emphasizes the importance of language production as a mechanism for strengthening language accuracy and complexity (Gustian et al., 2023; Liu, 2019; Rong, 2019; Tang, 2016; Yang & Deris, 2023). Thus, flipped classrooms not only provide flexibility in the learning process but also create an active learning environment that supports the development of language skills more holistically.

The flipped classroom is a learning model that emphasizes active student participation (Cho et al., 2021; Jamaludin et al., 2014; Rau et al., 2017; Santos & Serpa, 2020). In the context of English language learning, this model is often associated with increased learning achievement because it allows students to learn at their own pace, access materials flexibly, and interact more actively during face-to-face sessions (Afzali & Izadpanah, 2021; Ayçiçek & Yanpar, 2018; Turan & Akdag-Cimen, 2020). The use of technology in flipped classrooms provides students with access to flexible learning materials, allowing them to learn vocabulary, grammar, or important concepts in English before coming to

class. When in class, the available time can be used for discussion, speaking practice, or other interactive learning activities (Arslan, 2020; Cabý, 2018; Turan & Akdag-Cimen, 2020). This is very important in language acquisition, where direct practice and interaction with teachers and peers improve understanding and application of language in more practical contexts.

While many studies support the effectiveness of flipped classrooms, there are inconsistencies in the reported results. Several studies showed that the use of the flipped classroom model results in significant improvements in students' English language skills (Krisnanto et al., 2023; Sunaryati et al., 2024; Sunaryati et al., 2024; Irawati et al., 2022; Hariati et al., 2021; Maximilian & Ajeng, 2023; Dewi et al., 2023; Rizqi et al., 2023; Mumtazah et al., 2024), while another studies found no significant difference between the flipped classroom model and the traditional learning model (Syajili & Abadi, 2021; Wardhani et al., 2022). These differences in results indeed confuse the policymakers. Consequently, further investigation is required to address the discrepancies in the findings of this study. Table 1 below presents a summary of some key studies that demonstrate the diversity of findings.

**Table 1.** Summary of study findings related to the effectiveness of flipped classroom in english language learning

No.	Author & Year	Key Findings
1	Krisnanto et al. (2023)	Significant
2	Sunaryati et al. (2024)	Significant
3	Dewi et al. (2023)	Significant
4	Irawati et al. (2022)	Significant
5	Maximilian & Ajeng (2023)	Significant
6	Syajili & Abadi (2021)	No Significant
7	Wardhani et al. (2022)	No Significant

Based on the empirical gap above, one research approach that can be taken is meta-analysis. This approach will not only provide

deeper insights but can also help educators in designing more effective learning strategies (Sutisyanana et al., 2023; Farida et al., 2019).

Meta-analysis studies are research methods that aim to combine and analyze the results of several studies on the same topic. This method is very important in science because it combines available data, leading to more accurate and generalizable conclusions than individual studies. Through structured statistical analysis, meta-analysis creates effect sizes that show how much impact a particular variable or intervention has (Tavakol, 2019).

Meta-analysis pools data from multiple studies to increase the rigor of the research results. With the increased sample size that often occurs in meta-analysis, the statistical power to detect the efficacy of an intervention or effect becomes higher (Tavakol, 2019; Borenstein et al., 2021). Meta-analysis also allows researchers to find patterns that may not be visible in smaller studies (Retnawati et al., 2018; Yunita et al., 2020). Meta-analysis can help identify gaps in existing research. By evaluating the results of multiple studies, researchers can see areas where data is still limited or inconsistent, opening up opportunities for further research (Adil et al., 2023; Alsowat, 2020).

A previous meta-analysis related to the flipped classroom on foreign language learning as a second language was conducted by Ulum and Hukom (2025). Their findings showed that flipped classroom had a significant impact on students' foreign language skills compared to the traditional model. In addition, a previous meta-analysis conducted by Chen et al. (2018) in the field of medicine also showed that the flipped classroom had a significant positive impact on students' conceptual understanding and clinical skills. However, these studies have not specifically explored the effectiveness of the flipped classroom in the context of foreign language learning, which has unique characteristics, such as the need for meaningful interaction and language use practice. Therefore, this study aims to expand the scope of previous

findings by investigating the extent to which the flipped classroom is effective in improving students' English skills, as well as identifying contextual factors that influence its success.

This study aims to conduct a comprehensive analysis using a meta-analysis study, while the two main objectives of this study are to evaluate the effectiveness of the flipped classroom model compared to the traditional learning model on language skills and to identify what factors influence the differences in research results. To answer the objectives of this study, the following research questions (RQ) are formulated.

*RQ 1:* Is the flipped classroom model more effective than the traditional learning model on students' English language skills?

*RQ 2:* Does the effectiveness of the flipped classroom model on English language skills differ based on educational level?

*RQ 3:* Does the effectiveness of the flipped classroom model on English language proficiency differ based on class capacity?

*RQ 4:* Does the effectiveness of the flipped classroom model on English language proficiency differ based on the year of publication?

*RQ 5:* Does the effectiveness of the flipped classroom model on English language skills differ based on ability type?

## ■ **METHOD**

### **Research Design**

This study uses a meta-analysis design to evaluate the effectiveness of the implementation of the flipped classroom model compared to the traditional model on students' English language skills. The meta-analysis design was chosen with the aim of integrating previous research findings, thus providing a clearer picture of the impact of the implementation of the flipped classroom model on students' English language skills. Figure 1 presents the meta-analysis procedure, which

includes defining the research question, determining inclusion criteria, collecting and screening literature, data extraction and coding, and data analysis (Borenstein et al., 2009).



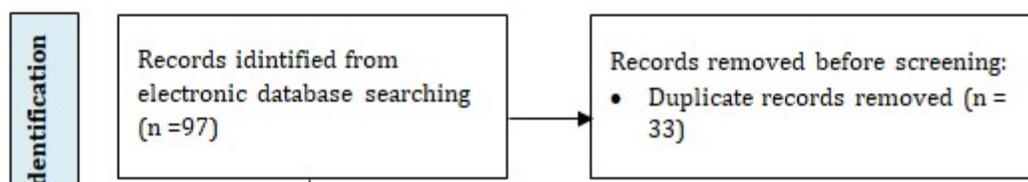
**Figure 1.** Meta-analysis procedure

### Inclusion Criteria and Data Collection

The inclusion criteria set for this meta-analysis included: (1) research articles published between 2019 and 2024; (2) using experimental, quasi-experimental, or observational research designs with a clear control group; (3) Studies must report data on English language proficiency using the flipped classroom model; (4) This study specifically limits the primary study to the Indonesian context to ensure the suitability of the social, cultural, and educational system contexts, which may influence how flipped classrooms are implemented and impact students' English language skills; (5) Studies must report sufficient statistical data to calculate effect sizes, such as mean values, standard deviations, and sample

sizes of each experimental and control group.

Data collection was carried out based on the established inclusion criteria, and data collection was carried out through Google Scholar and the Google search engine. The keywords used to facilitate the search were “flipped classroom OR flipped learning” AND “learning English OR Inggris” AND “eksperimen OR quasi-experimental”. The initial data collected were then filtered through four stages of PRISMA, namely identification, screening, eligibility, and inclusion. The screening results produced 20 primary studies that met the criteria for inclusion in this meta-analysis. The literature screening process can be seen in Figure 2 below.



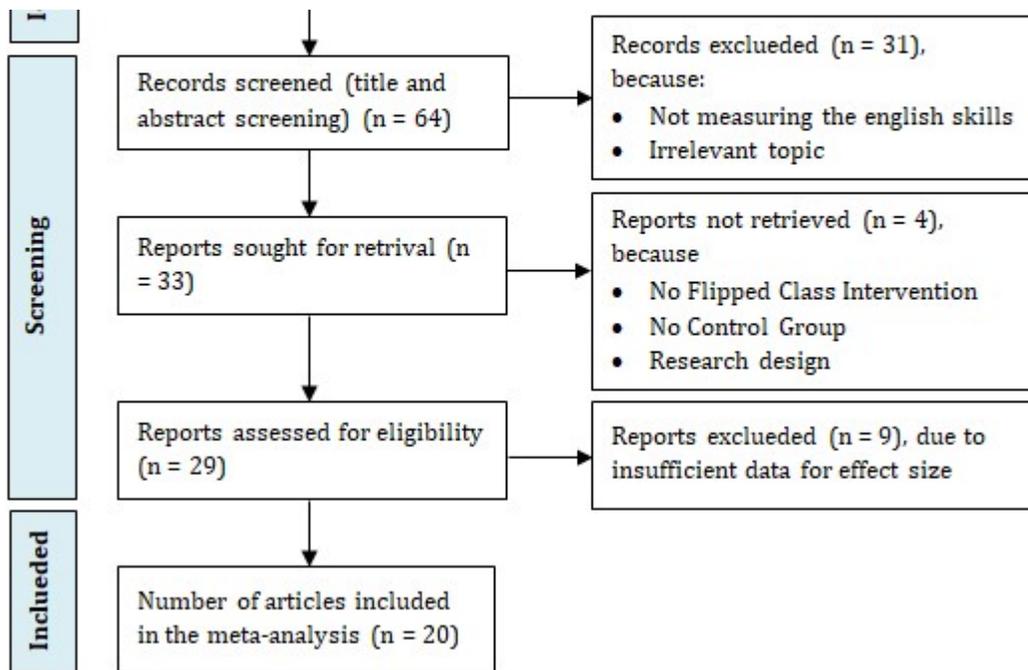
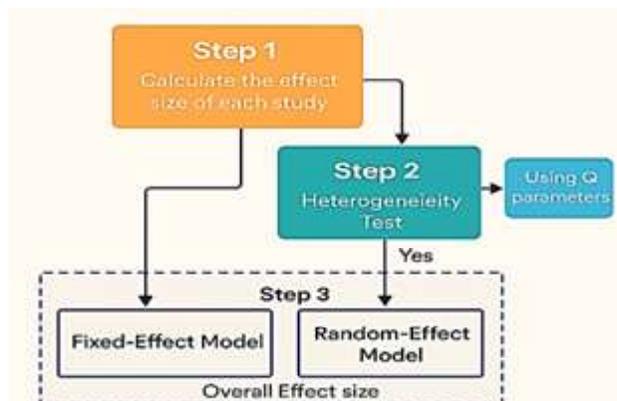


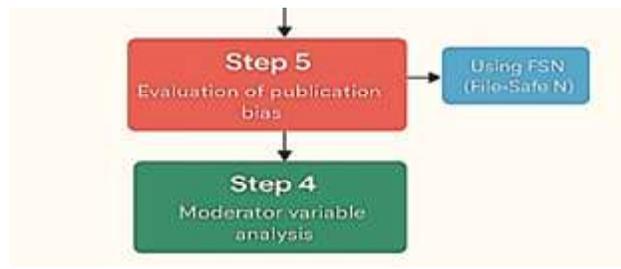
Figure 2. The screening process of the literature uses PRISMA

**Data Analysis**

Comprehensive Meta-Analysis (CMA) software version 3. The stages in the meta-analysis scheme applied include: 1) measuring the effect size of each study on the effect of flipped classroom implementation on students’ English skills; 2) calculating the pooled effect size and evaluating the issue of publication bias; and 3) analyzing moderator variables to identify factors that moderate the effect of flipped classroom on students’ English skills. The process of interpreting effect size in assessing the effect of flipped classroom implementation in this study

refers to the classification developed by Cohen (2017). The effect size (g) categories based on this classification are: 1) The “negligible” category if the effect size value is  $0.00 < g < d^* 0.19$ ; 2) The “small effect” category if the effect size value is  $0.19 < g < d^* 0.49$ ; 3) The “moderate impact” category if the effect size value is  $0.49 < g < d^* 0.79$ ; 4) “High impact” category if the effect size value is  $0.79 < g < d^* 1.29$ ; and 5) “Very high impact” category if the effect size value  $g > 1.29$ . The data analysis process using CMA software can be seen in Figure 3 below.





**Figure 3.** Data analysis scheme using CMA software

## ■ RESULT AND DISCUSSION

### The effectiveness of the flip classroom model on students' overall English language skills

The first objective of this analysis is to answer the first research question, namely, whether the use of the flipped classroom model is more effective than the traditional model on students' overall English language skills. The results of the effect size calculation for each study

were first calculated using CMA software version 3. The summary results are presented in Table 2 below.

Table 2 shows the variation of effect size from 20 studies analyzed, ranging from 0.33 to 3.11, with a confidence level of 95%. Then, the combined effect size is calculated. Table 3 explains the summary results of the calculation of the combined effect size.

**Table 2.** Effect size for each study

No	Author	Effect Size	Confidence Interval (CI)		Standard error
			Lower Limits	Upper Limits	
1	Krisnanto et al. (2023)	0.87	0.36	1.38	0.26
2	Sunaryati et al. (2024) a	3.11	2.33	3.88	0.39
3	Sunaryati et al. (2024) b	0.94	0.39	1.48	0.28
4	Suherni (2023) a	0.45	-0.11	1.01	0.28
5	Suherni (2023) b	1.01	0.43	1.60	0.30
6	Suherni (2023) c	0.62	0.06	1.19	0.29
7	Suherni (2023) d	0.74	0.17	1.31	0.29
8	Suherni (2023) e	0.98	0.39	1.56	0.30
9	Irawati et al. (2022)	0.89	0.37	1.42	0.27
10	Hariati et al. (2021)	0.89	0.37	1.41	0.27
11	Maximilian and Ajeng (2023)	1.10	0.52	1.69	0.30
12	Yan et al. (2024) a	0.18	-0.01	0.37	0.10
13	Yan et al. (2024) b	0.70	0.50	0.89	0.10
14	Yan et al. (2024) c	0.33	0.14	0.52	0.10
15	Zulkarnain and Lubis (2022)	0.49	0.02	0.96	0.24
16	Anggraini and Rafiola (2024)	0.49	0.02	0.96	0.24
17	Oktiyani et al. (2021)	0.64	0.14	1.14	0.26
18	Dewi et al. (2023)	1.21	0.60	1.82	0.31
19	Rizqi et al. (2023)	0.67	0.33	1.00	0.17
20	Mumtazah et al. (2024)	0.99	0.49	1.49	0.25

**Table 3.** Heterogeneity analysis and pooled effect sizes

Estimation Method	<i>k</i>	<i>g</i>	<i>p</i>	<i>df</i>	Heterogeneity			Decision
					<i>Q</i>	<i>p</i>	<i>i2</i>	
Random Effect	20	0.80	0.00	19	87.73	< 0.01	78.34	Reject H <sub>0</sub>
Fixed Effect	20	0.59	0.00	19				

Based on Table 3 above, the *Q* value is  $87.73 > \chi^2$  ( $df = 19$ ;  $p = 0.05$ ). It can be concluded that the distribution of effect sizes in the 20 studies analyzed is heterogeneous. Therefore, the estimation method used to calculate the combined effect size is random-effects. Based on the random effects estimation method (See Table 3), the combined effect size obtained is ( $g = 0.80$ ;  $p = 0.00$ ). This value is included in the large effect category (Cohen, 2017). Thus, it can be concluded that overall, the use of the flipped classroom model is more effective than the traditional model on students' English skills.

Previous studies have illustrated how flipped classrooms can create a more interactive learning environment and support student engagement. For example, Coscolluela et al. (2021) emphasized that this model not only improves students' understanding of the concept but also promotes 21st-century skills. In addition, a study by Chen et al. (2017) reported that students who participated in flipped classroom learning experienced increased motivation and perceived higher task value than students in conventional classes (Chen et al., 2017; Turan & Akdag-Cimen, 2020). This is in line with the finding that flipped classrooms encourage independent learning and self-regulation, which are crucial for language development (Linur & Mubarak, 2022).

Another benefit of the flipped classroom is its ability to enhance information retention and improve student academic outcomes. Kasat et al. (2020) showed that this technique resulted in better test scores for students compared to those who followed traditional learning. Additionally, in the field of medical education, Hew and Lo

(2018) conducted a meta-analysis that found that the flipped classroom not only achieved better academic outcomes but also improved overall student engagement. These findings support the conclusion that this learning model also has broad applications in other contexts, including English language education.

The publication bias was analyzed to ensure that the results of this meta-analysis were not affected by the tendency to select studies that only reported significant findings. The results of the publication bias analysis are presented in Figure 4 below. Based on the Classic Fail-safe *N* approach, a *Z* value of 15.31 was obtained with a *p*-value of 0.00000, indicating that the overall results of the meta-analysis were highly significant. The fail-safe *N* value of 1,201 means that at least 1,201 additional insignificant studies are needed to make the results of this meta-analysis insignificant ( $p > 0.05$ ). This number is much larger than the minimum tolerance threshold ( $5k + 10 = 110$ , with  $k = 20$ ), so it can be concluded that the results of this meta-analysis are stable and not susceptible to publication bias.

### **The Effectiveness of the Flipped Classroom Model on English Language Ability Based on Moderator Variables**

This study also aims to analyze the moderator variables in depth to identify what factors influence the effectiveness of the flipped classroom model on students' English language skills. The analysis of the moderator variables in this study includes educational level, experimental class capacity, year of publication, and type of ability measured. Table 4 presents the results of the moderator variable analysis.

<b>Classic fail-safe N</b>	
Z-value for observed studies	15.31334
P-value for observed studies	0.00000
Alpha	0.05000
Tails	2.00000
Z for alpha	1.95996
Number of observed studies	20.00000
Number of missing studies that would bring p-value to > alpha	1201.00000

**Figure 4.** Results of publication bias analysis with the classic fail-safe approach N

**Table 4.** Analysis of moderator variables

Moderator Variables	N	Effect Size	SE	P-value	Heterogeneity		
					Q-value	df(Q)	P-value
<b>Educational level</b>							
Collega	13	0.52	0.05	0.00	38.05	12	0.00
Senior High School	3	0.70	0.12	0.00	2.10	2	0.35
Junior High School	4	1.11	0.14	0.00	30.20	3	0.00
Qw					70.34	17	0.00
Qb					16.46	2	0.00
<b>Experimental Class Capacity</b>							
Big	9	0.47	0.05	0.00	24.93	8	0.00
Small	11	0.99	0.09	0.00	35.73	10	0.00
Qw					60.66	18	0.00
Qb					26.14	1	0.00
<b>Publication Year</b>							
2019-2021	2	0.76	0.18	0.00	0.45	1	0.50
2022-2024	18	0.58	0.04	0.00	85.47	17	0.00
Qw					85.92	18	0.00
Qb					0.88	1	0.35
<b>Ability Type</b>							
Grammar	2	0.93	0.20	0.00	0.04	1	0.84
Learning outcomes	4	0.75	0.12	0.00	4.03	3	0.26
Listening	2	0.20	0.09	0.03	0.82	1	0.37
Motivation to learn	1	3.11	0.39	0.00	0.00	0	1.00
Reading	6	0.78	0.08	0.00	3.68	5	0.60
Speaking	3	0.69	0.15	0.00	1.19	2	0.55
Writing	2	0.36	0.09	0.00	0.94	1	0.33
Qw					10.70	13	0.64
Qb					76.11	6	0.00

### ***Educational Level***

Table 4 shows the value of  $Q_b = 16.46$ , this value is greater than  $\div 2$  ( $df = 2$ ;  $p = 0.05$ ). These results indicate that the effectiveness of the flipped classroom model on English language skills differs based on the level of education. These results indicate that the effect of the flipped classroom model cannot be considered uniform across all levels of education; instead, its effectiveness varies depending on the specific educational context. These results are also in line with previous research findings showing that the effectiveness of learning methods can differ significantly depending on the level of education. For example, several studies have found that students at the tertiary level benefit more from flipped classrooms than students at the secondary or elementary school level. This may be due to differences in the level of learning independence and cognitive abilities of students (Cahyani et al., 2024; Chen et al., 2017; Purnomo et al., 2022; Sulistyowati et al., 2023; Ulum & Hukom, 2025).

However, it is interesting to note that in this meta-analysis, the highest effectiveness value was found at the junior high school level ( $g = 1.11$ ), which theoretically contradicts the general assumption that college students benefit more from this model because they have a higher level of learning independence. Several possibilities can explain this contradiction. First, the structured and directed flipped classroom model may provide much-needed scaffolding for junior high school students who are still at the stage of developing independent learning skills. In this context, learning videos and planned class activities can help them understand the material gradually, while increasing their confidence in using language. Second, the novelty effect may also play an important role. Since technology-based learning, such as flipped classrooms, is still relatively rare at the junior high school level, this approach may provide additional appeal and motivation for students, which ultimately has a positive impact on their learning

outcomes. Therefore, although the effectiveness of this model generally supports learning at all levels, these results indicate the need to consider the different characteristics and learning needs at each level of education.

### ***Experimental Class Capacity***

Table 4 shows the value of  $Q_b = 26.14$ , this value is greater than  $\div 2$  ( $df = 1$ ;  $p = 0.05$ ). This result indicates that the effectiveness of the flipped classroom model on English language skills differs based on the capacity of the experimental class. This finding provides important insights into how factors such as class capacity can affect learning outcomes with the flipped classroom model. Class capacity refers to the number of students allowed or expected to be in one learning group. This capacity has a significant effect on class dynamics, interactions between students, and relationships between students and teachers. In the context of a flipped classroom, where interaction and collaboration are key, class size can affect the efficiency of implementing this model (Coscolluela et al., 2021).

Smaller classes often provide more intensive interaction between students and instructors. With fewer students, instructors can provide more individual attention, allowing for deeper learning and greater personalization. Research shows that students in smaller classes are able to participate more actively in discussions and collaborative activities, thereby improving their learning outcomes (Chen et al., 2017). In contrast, when classes are larger, challenges arise in terms of communication and management of learning activities. Although flipped classrooms can be an effective strategy, their successful implementation may be limited by classroom management challenges and a lack of direct interaction between students and teachers. This can decrease student engagement and slow the learning process (Linur & Mubarak, 2022). Despite the significant differences between

educational level groups, the use of the flipped classroom model on English language proficiency is effective in both small and large capacities.

### **Publication Year**

Table 4 shows the value of  $Q_b = 0.88$ ; this value is smaller than  $\div 2$  ( $df = 1$ ;  $p = 0.05$ ). This result shows that the effectiveness of the flipped classroom model on English language ability does not differ significantly based on the year of publication. This result indicates that, although many studies have been conducted over time, the flipped classroom model consistently affects English language skills across studies, with no significant fluctuations related to the year of publication. The flipped classroom is based on social learning theory and constructivism, which shows that active student engagement in the learning process leads to better outcomes, no matter when the study was conducted. That is one of the reasons why the results remain stable (Linur & Mubarak, 2022).

While there was no significant difference based on the year of publication, a more in-depth longitudinal study may be needed to explore the evolution and long-term effectiveness of flipped classrooms in different contexts (Hew & Lo, 2018). It is important to continue to develop and diversify learning approaches in flipped classrooms so as not to get stuck in a certain routine, even though the results are consistent. This can enrich students' learning experiences and improve academic achievement.

### **Ability Type**

Table 4 shows that the  $Q_b$  value = 76.11, which exceeds the  $\div 2$  value at  $df = 6$  with  $p < 0.05$ , indicating a significant difference in the effectiveness of the flipped classroom model based on the type of language ability measured. Specifically, the findings show that this model has the most significant effect on grammar mastery with an effect size of  $g = 0.93$ , while the effects

are relatively small on listening and writing skills, respectively,  $g = 0.20$  and  $g = 0.36$ . An extreme effect was found on learning motivation ( $g = 3.11$ ), which, although high, is only based on one study and is likely an outlier.

This difference may be due to the pedagogical characteristics of each skill. Grammar is an aspect that is very suitable to be delivered through videos or pre-lesson materials, where students can learn the rules and structures independently, then practice them actively in class. This pattern is in line with the principle of the flipped classroom, which emphasizes conceptual understanding outside the classroom and application in class discussions or exercises. In contrast, listening skills showed a low effect size, which is likely due to the lack of in-depth and contextual activities that support listening skills in face-to-face sessions. The use of audio materials in flipped classrooms is often passive and not balanced with interactive exercises in class that involve active listening strategies. Similarly, in writing skills, the low effectiveness is likely due to the suboptimal classroom environment in providing direct feedback and the revision process that is much needed in developing writing skills.

Meanwhile, the finding of a very large effect size on learning motivation ( $g = 3.11$ ) needs to be interpreted with caution because it only comes from one primary study. This value is likely an outlier, both due to the very strong affective intervention design and the unique characteristics of the sample and learning context in the study. Nevertheless, this indicates the potential of the flipped classroom model in increasing learning motivation if designed with attention to aspects of student engagement, learning autonomy, and material relevance. In the future, further studies are needed to confirm these findings with a larger study sample size and a more standardized motivation measurement approach.

### **Practical Implications and Research Limitations**

The findings of this meta-analysis provide several implications for educators, especially English teachers and lecturers. First, the results of the moderator analysis show that the effectiveness of the flipped classroom model tends to be higher at the secondary education level, such as junior high schools. This result shows that junior high school teachers are highly supported to apply this model in English learning because this approach is able to encourage student engagement, increase learning motivation, and provide space for strengthening language skills through interactive classroom activities. Therefore, teachers are advised to start compiling simple but contextual digital materials, as well as designing classroom activities that are collaborative and based on language practice.

In contrast, for higher education contexts with a large number of students, the effectiveness of the flipped classroom tends to be lower. This may be due to limited personal interaction and challenges in managing active participation in large classes. To overcome this, lecturers are encouraged to utilize digital technology more strategically, such as polling applications (e.g., Mentimeter or Slido), online discussion forums, or breakout room features in online learning platforms to facilitate more meaningful small group discussions during face-to-face sessions. This approach allows students to remain actively engaged even in large classes while maintaining the essence of the flipped classroom as a learning model based on active participation and interaction.

Although this study makes an important contribution to understanding the effectiveness of the flipped classroom in English language learning, there are several limitations that need to be acknowledged. First, the literature search in this meta-analysis was limited to certain databases, which may have missed relevant studies in the selection process. Second, this study did not

conduct a quality assessment of the primary studies included in the analysis, so variations in methodological quality between studies could not be controlled. Third, the publication bias analysis was not reported, which could affect the interpretation of the effect sizes obtained. Fourth, the coding of moderator variables still faces limitations, especially in the category of “type of ability,” which includes a combination of language skills (e.g., reading, writing) and affective aspects such as motivation. In the future, the classification of moderator variables needs to be done more carefully in order to reflect clearer and more consistent category differences.

### **CONCLUSION**

Overall, a meta-analysis of 20 studies showed that the use of the flipped classroom model is more effective than the traditional model on students' English language skills. In addition, the effectiveness of the flipped classroom model on English language skills is influenced and different based on the variables of educational level, experimental class capacity, and the type of ability measured. Therefore, educators need to consider these factors when designing and implementing the flipped classroom model in English learning.

Although the analysis of moderators used in this study, such as educational level, class capacity, and types of skills measured, showed differences in the effectiveness of flipped classrooms, heterogeneity across studies remained high, even within subgroups. This suggests that variability in effectiveness is not fully explained by the moderators analyzed. Therefore, it is important to acknowledge the possibility that other factors that have not been examined could potentially influence the results. Some possible additional sources of heterogeneity include differences in intervention duration across studies, intensity and quality of out-of-class assignments, type and complexity of technology used to support learning, and students' cultural

backgrounds that may influence how they respond to this learning model. Future research is recommended to explore these moderators to gain a more comprehensive understanding of the conditions that influence the success of flipped classrooms in English language learning.

In the future, the flipped classroom model is expected to evolve alongside the rapid development of educational technology in the digital era. The application of this model has the potential to be strengthened by the presence of technologies such as adaptive Artificial Intelligence (AI), which is able to personalize learning materials according to the needs and development of each student. In addition, immersive technologies such as Virtual Reality (VR) and Augmented Reality (AR) open up opportunities to create a more contextual and realistic language learning environment, where students can practice communication skills in situations that resemble real life without having to leave the classroom. These innovations can enrich the learning experience in the flipped classroom, making it more interactive, engaging, and pedagogically meaningful. Therefore, it is important for researchers and educators to continue to be responsive to the development of this technology and integrate it strategically to increase the effectiveness of language learning in the future.

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