The Flipped Classroom on English Learning Achievement: A Meta-Analysis Study

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Abstract. One of the ways to cover and serve better English learning is by maintaining the right teaching method. Flipped classroom is a teaching method believed to be effective in reaching English inclusion. This study's objective is to determine the effectiveness of using the flipped classroom on students' English learning achievement at the university level. This study is a quantitative study using a meta-analysis design. 50 studies were collected from Google Scholar and Scopus databases from 2016 – 2021 reporting the average and standard deviation of English learning achievement scores. The results of this study indicate that the flipped classroom will be more significant in affecting English learning achievement if it is implemented in a medium-sized sample (21-40), with 9 – 16 weeks of intervention, using two models of teaching method and being helped by more than one tool and resources in teaching. The flipped classroom is appropriate to be implemented in the English learning process involving the inclusion of all students with different departments and levels of academic year. The study suggests that the flipped classroom is a viable alternative to traditional instruction, enhancing critical thinking and English skills through exposure and activities, emphasizing the importance of new instructional strategies.

Keywords: English learning, English achievement, Flipped Classroom, Meta-Analysis

1   Introduction

In fact, with the advancement of online learning, flipped classroom (henceforth, FC) model has been increasingly popular as an innovative learning practice to support education at a higher level [1]. FC offers a new paradigm in the teaching and learning process. This FC model reverses traditional teaching and realigns teaching time to provide more time in the school for learning. In conventional education, all learning processes, including material, theory, and practice, are given simultaneously in the classroom, but it is slightly different for the flipped classroom.

Although the flipped classroom has received significant attention in recent years [2], during Covid 19, this learning method was the first to be considered for implementation. Flipped classroom changes the time in class and outside the school to allow more interaction between the teacher and students [3]. It is following learning needs during a pandemic, where one of the health protocols that must be implemented is avoiding crowds and reducing mobility.

The application of the flipped classroom has been taking shape in many studies. Several studies have found that the flipped classroom learning paradigm can boost student achievement and motivation [4]. This is reasonable that time spent in class and outside of school is changed in a flipped classroom to allow for more contact between the teacher and students [3]. Many teaching subjects use this model in the classroom, mainly STEM learning. Meanwhile, research on the practical use of flipped classrooms in language acquisition, particularly English, is still limited. This is based on Therefore, research on the effectiveness of the flipped classroom model in English subjects needs to be explored to optimize the learning process and outcomes.

There have been many studies in the form of meta-analyses that scholars have carried out regarding flipped classrooms in the learning process [5]–[7]. Implementing FC positively impacts the learning process, such as increasing a vibrant learning atmosphere and increasing student achievement in the academic field. However, several studies have reported the FC weaknesses of the flipped. One example is from [8], finding that is students' unwell preparation from the students influenced its effectiveness. They are easily bothered when watching material such as videos [9]. Moreover, the students' self-motivation plays a more significant part in creating an exciting atmosphere for FC [10]. Another reason for the less effectiveness of FC is to monitor the understanding and comprehension from the students when they are doing learning activities outside the classroom and give feedback that meets their needs [11].

Although several previous meta-analytical reviews have served many things dealt with FC (see [2], [12]), there are two critical things from that research. Firstly, not many studies examine the contribution of FC in students' achievement in learning language compared to traditional classes, especially English. It becomes important because in learning English, giving much time for students to be able to gain exposure and get practice is very important. This method can increase the intake obtained by students. So that later, learning English can run more effectively and actively, which will indirectly also positively impact learning outcomes. Secondly, previous research did not address some moderator variables in implementing FC. It causes a lack of comprehensiveness. This current meta-analysis involves studies from 2016 to 2021 covering some moderators variables.

Activity theory, in this current study, is used as a tool to analyze the results of the FC study and the moderating variables' effects. The activity theory was adapted from previous researches [2], [13], [14]. Six aspects can be used as moderating variables in analyzing the effectiveness of learning activities. They are subject, objectives, rules, context, interaction, and tools.

Two areas of inquiry are the focus of this work. The first is to ascertain whether FC is useful for accomplishing language learning objectives. Finding out what factors influence the impact of using FC on language learning achievement is the second goal of this research. Six moderating variables—sample size, learning domain, class flip model, length of intervention, classroom teaching strategies, sample area, and pre-class resources—are examined in this study. Thus, the following inquiries for investigation were made: (1) How effective is the use of the flipped classroom on the achievement of learning English? (2) How do various moderator variables affect the flipped

classroom effects? (3) To what extent the flipped classroom creates English learning inclusion in university level.

2   Method

This study implements quantitative research with meta-analysis as the design. The research objective is to identify how significant the average influence of FC is in English learning achievements. Meta-analysis research gives an alternative to delve into an overview of the average size of the effect of FC in English learning achievements by evaluating the findings of the previous study with statistics.

This research data is taken from Publish or Perish since this software can provide the references from the theme we need. This application helps the researcher to retrieve and analyze the relevant studies thoroughly and briefly. It provides systemic ways to do a literature review. From Publish or Perish, Google Scholars and Scopus were selected to be the filter since those two suites are possibly accessible by the researcher. Only two sites were taken because those sites are possible for the researcher to access. Each publication published between 2016 and 2021 that was pertinent to the FC in English learning was downloaded and examined in more detail. The year's range was chosen to accommodate the novelty of the research.

The keyword used is the effectiveness of the FC on the English learning achievement. From the first search, with a limit of 1000, articles downloaded were 816 from Google Scholar and 16 from Scopus. Reduce some articles not included in the discussion, repeated papers, papers with no conceptual similarity and studies that do not report English language achievement, do not write subject, objectives, rules and context, interactions, and tools, do not provide adequate statistical information, obtain 50 studies.

There are two steps involved in the selection of research papers. 832 research publications were found in the first search, including 816 from Google Scholars and 16 from Scopus. The following standards were applied when reviewing each research paper: research articles written in English between 2016 and 2021 were the only ones included in this analysis. Quasi-experimental or true-experimental studies are included. A sufficient amount of statistical data on English learning achievement—which can be measured by listening, speaking, reading, writing, and grammar—must be provided by the chosen studies in order to calculate effect sizes, such as mean, standard deviation, and the number of participants in each group. The studies must also describe how to apply the flipped classroom, including subjects, objectives, rules, context, interactions, and tools. Finally, using the aforementioned criteria, fifty research papers were included in this study for additional analysis.

2.1   The Procedures of Conducting a Meta-Analysis

In conducting a meta-analysis study, some steps are required to maintain the result of the proof to answer the research questions. In this meta-analysis, the FC effectiveness in escalating students' English learning achievement. The support of variables

moderators in each study involved in this analysis does support the reason of the significance.

The procedures of conducting a meta-analysis is clearly discussed by [15]. When conducting a meta-analysis that employs study parameters in the form of means, researchers must consider whether each study measures variables on the same scale. The standard error of the effect size for the same size across studies and different formulas. This study's meta-analysis utilizes artifacts or studies on variables with the same scale. The effect size-the average score of certain variables that are the focus of each study is taken as the mean in this meta-analysis.

3   Results and Discussion

This study analyzes the demographics of 50 papers (see [1], [3], [16]-[32]) that discuss the effects of using the EF on the outcomes of learning English. The outcomes will be thoroughly explained in the sections that follow. There are 816 participants in 50 publications. Most of the research used two different teaching modalities and the conventional flipped classroom approach to perform a 5-to 9-week study under quasi-experimental design. Regarding the setting, most of the research used FC in Asian countries. In terms of how learning occurs, most of the research included participants in two or more pre-class exchanges and three or more classroom encounters. The majority of the studies used two different kinds of pre-class resources in addition to an online learning platform.

3.1   Overall effect size

The effect size of the fifty studies that were chosen was determined using a random effect model, which was chosen based on the homogeneity test result. With a 95% confidence interval of 68.253 – 75.624, the overall effect size for English achievement was 71.938, according to the results. Based on Cohen's findings, effect sizes of 0.80/80, 0.50/50, and 0.20/20 were deemed larger, medium, and smaller, respectively [33]. Therefore, the FC model has a moderate effect on students' English achievement.

3.2   Forest Plot

Further, the summary effect size from the study should be investigated. Summary effect size or effect size from aggregate can be seen from a forest plot. Forest plot contains various elements. In addition to the bars in the plot of the confidence interval of each study and their effectiveness, each bar in response to a particular meaning is also presented. The left end is the lower limit, the right end is the upper limit. In the middle, there is a square with the size of which indicates the magnitude of the weighting, and its position states the location of the effect size of each study. At the bottom there is a Diamond whose area is the total area of the total weight of each study and its position states the magnitude of the effect size aggregation [15]. The result of the forest plot can be seen in Figure 1.

From the Forest plot of this study, the study that has the largest confidence interval is Study 6, the study conducted by Ho. This study was conducted at a university

in China with a sample size of 25 (medium size) game rocks in the intervention. On the other hand, the study that has the smallest confidence interval is study 16. This study is a study conducted by Lin & Wang [34]. This study was conducted at a university in Taiwan with a sample of 33 (medium size) with the help of online video media & Platforms in their interactions. This study is an 18-week intervention.
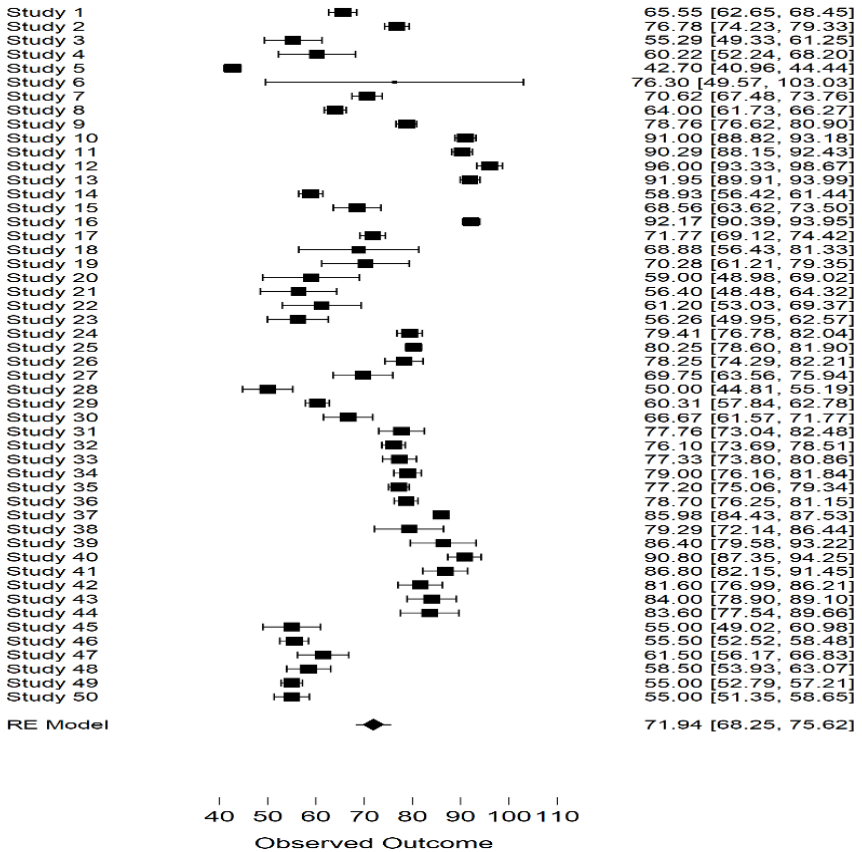
3.3   Heterogeneity Test

Study 1	65.55 [62.65, 68.45]
Study 2	76.78 [74.23, 79.33]
Study 3	55.29 [49.33, 61.25]
Study 4	60.22 [52.24, 68.20]
Study 5	42.70 [40.96, 44.44]
Study 6	76.30 [49.57, 103.03]
Study 7	70.62 [67.48, 73.76]
Study 8	64.00 [61.73, 66.27]
Study 9	78.76 [76.62, 80.90]
Study 10	91.00 [88.82, 93.18]
Study 11	90.29 [88.15, 92.43]
Study 12	96.00 [93.33, 98.67]
Study 13	91.95 [89.91, 93.99]
Study 14	58.93 [56.42, 61.44]
Study 15	68.56 [63.62, 73.50]
Study 16	92.17 [90.39, 93.95]
Study 17	71.77 [69.12, 74.42]
Study 18	68.88 [56.43, 81.33]
Study 19	70.28 [61.21, 79.35]
Study 20	59.00 [48.98, 69.02]
Study 21	56.40 [48.48, 64.32]
Study 22	61.20 [53.03, 69.37]
Study 23	56.26 [49.95, 62.57]
Study 24	79.41 [76.78, 82.04]
Study 25	80.25 [78.60, 81.90]
Study 26	78.25 [74.29, 82.21]
Study 27	69.75 [63.56, 75.94]
Study 28	50.00 [44.81, 55.19]
Study 29	60.31 [57.84, 62.78]
Study 30	66.67 [61.57, 71.77]
Study 31	77.76 [73.04, 82.48]
Study 32	76.10 [73.69, 78.51]
Study 33	77.33 [73.80, 80.86]
Study 34	79.00 [76.16, 81.84]
Study 35	77.20 [75.06, 79.34]
Study 36	78.70 [76.25, 81.15]
Study 37	85.98 [84.43, 87.53]
Study 38	79.29 [72.14, 86.44]
Study 39	86.40 [79.58, 93.22]
Study 40	90.80 [87.35, 94.25]
Study 41	86.80 [82.15, 91.45]
Study 42	81.60 [76.99, 86.21]
Study 43	84.00 [78.90, 89.10]
Study 44	83.60 [77.54, 89.66]
Study 45	55.00 [49.02, 60.98]
Study 46	55.50 [52.52, 58.48]
Study 47	61.50 [56.17, 66.83]
Study 48	58.50 [53.93, 63.07]
Study 49	55.00 [52.79, 57.21]
Study 50	55.00 [51.35, 58.65]
RE Model	71.94 [68.25, 75.62]

Fig. 1. Forest Plot

The heterogeneity test is conducted to prove that the studies included in the meta-analyses are homogeneous or heterogeneous. It is essential to analyze since the heterogeneity can provide the reasons why the study is found out significant. In this case, the effectiveness of the flipped classroom in learning English to reach English learning inclusion. The result of heterogeneity test is displayed in Table 3.

Table 1. Heterogeneity Test

	Q	df	p
Omnibus test of Model Coefficients	1463.673	1	< .001
Test of Residual Heterogeneity	4400.756	4 9	< .001

Note. p -values are approximate.

Using df (k – 1) = 49 and a p-value < 0.001, Table 3 provides the Q statistics value obtained for the test of residual heterogeneity: 4400.756. From this result, the H_0 stated that the data is homogenous is rejected. It is based on the critical criteria for the rejection area; H_0 is rejected if the p-value <0.05 with a significance level of 95% (α=0.05) [15]. Since H_0 is rejected, the data is heterogeneous. To seek further about the variables causes the heterogeneity of this analysis result, the analysis of variable moderators should be operated.

3.4   **Variable Moderators**

Variable moderators cause the result of data analysis in heterogeneity test. The variable moderators consist of six variables. They are subject, objectives, rules, context, interaction, and tools taken from activity theory used by Sung, Yang, & Lee, and Zheng et al. in their studies [2], [14]. The variable moderators are used to categorize the studies collected. In more detail, the variable moderators, and the portion of them in this current meta-analysis are described in Table 2.

From the variable moderators, the heterogeneous of studies involved in this meta-analysis are caused by some division and sub dimensions usually take part in FC. Those are the candidates of moderator variables that can be used to differentiate each result of study dealing with FC. Moreover, for meta-analysis study, that information is needed in examining the specific influence of FC.

The further explanation about moderator variables is needed. Based on table 1 (activity theory), moderator variables are explained to delve into the effect of them on the implementation of FC on English learning achievement.

Sample size.
Dealing with sample size, there were three parts of it; they are a medium sample size of 21-40 producing the largest effect size, a small sample size (1-20) in the second place, and a large sample size (more than 40) in the last. There was no significant difference among them if we see from the aggregate score in Figure 1. Yet high confidence intervals were found in medium sample sizes. Cheng et al. had the same result as it that there is no significant effect of sample size in the FC [35]. The analysis reveals an intriguing trend: studies conducted with smaller sample sizes tend to yield larger effects than those with larger sample sizes. This phenomenon may stem from the scarcity of research utilizing small sample sizes. Additionally, our study underscores that the smallest sample sizes corresponded to the largest effect sizes. This correlation

can be attributed to the reduced sources of variation inherent in smaller samples, thereby amplifying the observed effect size [36].

Table 2. Variable Moderators

Dimension	Sub Dimension	Coding Scheme	n/Percentage
Subject	Sample size	Small 1-20	38%
		Medium 21-40	58%
		Big 41-60	4%
Objectives	Learning result domain	Integrated	30%
		Per Skill/component	70%
Rules	Flipped classroom model	Traditional	13%
		Innovative	87%
	Intervention duration	2-4 weeks	26%
		5-9 weeks	42%
		9-18 weeks	34%
	Teaching method	1 teaching method	18%
		2 teaching methods	62%
		3 or more taching methods	20%
Context	Country	Asia	60%
		Europe	40%
Interaction	Pre-class interaction	Reading material/book/syntax/module	12%
		Watching tutorial video/teaching	62%
		Mixed	26%
	On-class interaction	Group discussion	26%
		Presentation	48%
		Quiz	26%
Tools	Teaching tools and resources	Online learning platform	48%
		Video recording	36%
		Text	16%

Objectives.
The forest plot shows that the effect size for the ultimate goal is English learning outcomes per skill achieving a higher effect size than the global/integrated assessment of English learning outcomes. For the domain of learning outcomes, there is no significant difference between the integrated and per skill/component domains. These results suggest that the effectiveness of the flipped classroom is not much impacted by the learning outcomes domain. This finding could be explained by the fact that each domain of learning outcomes, either overall or per skill/competence, will benefit from the appropriate application of FC. Cheng et al. discovered, however, that the learning domain varied significantly [35]. The fact that the two studies' data and statistical information came from different sources could be one explanation.

Rules.

The Forest Plot also shows that the innovative model of FC produces a larger effect size than the traditional one. This is because various sources of learning that are not monotonous increase students' motivation in learning, so as to improve learning outcomes, especially in the field of language [37].

Intervention.

One explanation could be that the sourcesConcerning the length of the intervention, the results indicated that the 9–18-week intervention had the greatest effect size, which was followed by the 2-4 week and 5–9 week interventions. The results show that the FC model does not significantly differ. Consequently, practitioners have the option of using the cutting-edge classroom or the conventional FC paradigm. Furthermore, only 5.3% of the research in this meta-analysis selected a real experiment, whereas 94.7% of the studies utilized a quasi-experimental design. Compared to the quasi-experimental design, the actual experimental design has a greater impact size. As a result, more accurate experimental research on FC must be done. Furthermore, the duration of the intermediate intervention had the biggest effect magnitude, according to this study. The primary cause might be that different data and statistical information from the two studies are used, which could lead to difference in length and prevent validation of the FC's efficacy in too short a time.

Teaching method.

The many forms of teaching approaches don't really differ from one another. As a result, based on the learning objectives and curriculum, educators and practitioners can select the most effective teaching strategies. Regarding instructional strategies used in in-person classrooms, the findings indicate that two instructional strategies have the most impact size, followed by three or more strategies, and one strategy.

Context.

The results show that the FC approach in learning English produces the largest effect size in Europe. This is because European countries have adopted a student-centered learning style and are supported by technology and innovation in learning that is more advanced than several countries in Asia. This is contrary to the results of the meta-analysis of Zheng, Bhagat, Zhen & Zhang which states that the meta-analysis is more significant in some developing countries because it can help these countries in learning [2].

Communication.

Pre-class and in-class contact are two important communication modalities within the flipped classroom paradigm that are examined in this study. Interestingly, the data shows that the most significant effect size is produced by watching instructional videos, which is followed by using learning resources, taking part in two different kinds of interactions, and participating in three or more interactive activities. In terms of in-class interactions, the data show that using two different types of interactions results in the

largest impact sizes, whereas using three or more different types of interactions produces effect sizes that are significantly smaller.

3.5   Bias Publication

From some analysis steps done, the result of this meta-analysis on the effectiveness of flipped classroom on students' English learning achievements that can meet English learning inclusion should be tested of the bias publication. This test is to convince that all studies included in this meta-analysis are not bias in their results.

Publication bias refers to the probability of finding research results that accept the null hypothesis (there is not statistically significant or negative effect, significant but in the opposite direction to the general or expected theory construction) but are less likely to be published. This bias is thought to be caused by researchers who are less motivated to publish research results who must accept the null hypothesis [15]. In addition, this bias is also thought to be caused by a selective process on the part of journals which tend to reject or give small opportunities to accept the results of such research and are more interested in accepting and quickly publishing research results that are positively significant, even if published tend to be late or delayed. [38].

To measure the prediction of unpublished studies about flipped classroom on English learning achievement, file drawer analysis can be operated.

Table 1. File Drawer Analysis

	Fail-safe N	Target Significance	Observed Significance
Rosenthal	1.706e +6	0.050	< .001

From the File Drawer analysis table, the Fail-safe N value is 1.706e+6. It means that it is assumed that there are 1,706e+6 studies whose results are thought to be biased/methodologically not well done. So, the results of these studies are not reported.

Then to ensure that the study that we analyze is not included in a study that contains bias, it can be checked using the 5k + 10 (Rosenthal) formula. If the calculation result of 5k+10 is greater than the Fail-safe N value, then the study that we analyze with this meta-analysis is included in the study with a bias problem. The calculation result is $5(50) + 10 = 250 < 1.706e+6$, so the analyzed study does not have publication bias problems.

From the results of some tests to check the bias publication, they reveal and endorse that the 50 studies are not biased or that the 50 studies are valid. It strengthens the result of the meta-analysis that the FC effectively improves students' English learning achievement by providing inclusion in English learning.

4   Conclusion

Substantial evidence was gained from this meta-analysis study on implementing flipped classrooms on English learning achievement. The positive effect on English learning achievement comes from the performance of the flipped classroom itself and some moderator variables influencing it. The findings from this study are that 50 studies involved in this meta-analysis reveal that the FC model has a mediocre effect size of

71.938 on English learning achievement. The results also indicate that six moderator variables from activity theories contribute to the effectiveness of flipped classrooms. The six moderator variables having moderated effect sizes are medium sample size, 5-9 weeks intervention, innovative teaching methods, using videos and online learning platforms and using more than one resource in learning.

These findings contribute insight that can be implemented in the FC in English learning. The results also strengthen and support the learning activities during the covid 19 pandemic banning all academic activities operated as usual. This model can be used in learning activities, especially English lessons. Since students have so much free time at home and more accessible access to gadgets and information, this opportunity can be used to instruct them to master material before the actual class via zoom, Google Meet, or other applications. The implementation of FC inevitably offers adequate time for learning material. This model helps the learning process; furthermore, English subjects need much time to practice. The advantages of FC trigger English learning inclusion.

The suggestions for the next researcher are to engage more year coverage to gain more complex findings and analysis. On the other hand, more moderator variables are also needed to be investigated to complete the analysis results. The moderator variables may vary from the need of each researcher.

References

1. M. Öztürk and Ü. Çakıroğlu, "Flipped learning design in EFL classrooms: implementing self-regulated learning strategies to develop language skills," *Smart Learn. Environ.*, vol. 8, no. 1, 2021, doi: 10.1186/s40561-021-00146-x.
2. L. Zheng, K. K. Bhagat, Y. Zhen, and X. Zhang, "The effectiveness of the flipped classroom on students' learning achievement and learning motivation: A meta-analysijs," *Educ. Technol. Soc.*, vol. 23, no. 1, pp. 1–15, 2020.
3. C. L. Lai and G. J. Hwang, "A self-regulated flipped classroom approach to improving students' learning performance in a mathematics course," *Comput. Educ.*, vol. 100, pp. 126–140, 2016, doi: 10.1016/j.compedu.2016.05.006.
4. L. Zheng, K. K. Bhagat, Y. Zhen, and X. Zhang, "The Effectiveness of the Flipped Classroom on Students' Learning Achievement and Learning Motivation," *J. Educ. Technol. ...*, 2020, [Online]. Available: https://www.jstor.org/stable/26915403.
5. P. Etemadfar, S. M. A. Soozandehfar, and E. Namaziandost, "An account of EFL learners' listening comprehension and critical thinking in the flipped classroom model," *Cogent Educ.*, vol. 7, no. 1, 2020, doi: 10.1080/2331186X.2020.1835150.
6. M. K. Seery, "Flipped learning in higher education chemistry: Emerging trends and potential directions," *Chem. Educ. Res. Pract.*, vol. 16, no. 4, pp. 758–768, 2015, doi: 10.1039/c5rp00136f.
7. V. P. S. Njie-Carr, E. Ludeman, M. C. Lee, D. Dordunoo, N. M. Trocky, and L. S. Jenkins, *An Integrative Review of Flipped Classroom Teaching Models in Nursing Education*, vol. 33, no. 2. Elsevier B.V., 2017.
8. L. Mellefont and J. Fei, "Student perceptions of 'flipped' microbiology laboratory classes," *Int. J. Innov. Sci. Math. Educ.*, vol. 24, no. 1, pp. 24–35, 2016.
9. R. Toto and H. Nguyen, "Flipping the work design in an industrial engineering course," *Proc. - Front. Educ. Conf. FIE*, pp. 1–4, 2009, doi: 10.1109/FIE.2009.5350529.

10. T. Wang, "Overcoming barriers to 'flip': building teacher's capacity for the adoption of flipped classroom in Hong Kong secondary schools," *Res. Pract. Technol. Enhanc. Learn.*, vol. 12, no. 1, 2017, doi: 10.1186/s41039-017-0047-7.

11. N. Milman, "The flipped classroom strategy: What is it and how can it be used?," *Distance Learn.*, vol. 9, no. 3, pp. 85–87, 2012.

12. Y. T. Sung Yang, J. M., & Lee, H. Y., "The effects of mobile-computer-supported collaborative learning: Meta-analysis and critical synthesis.," *Rev. Educ. Res.*, vol. 87, no. 4, pp. 768–805, 2017.

13. Y. Engestrom, Learning by expanding: An activity-theoretical approach to developmental research. Helsinki, Finland: Prienta-Konsultit Oy, 1987.

14. H. Y. Sung, Y. T., Yang, J. M., & Lee, "The effects of mobile-computer-supported collaborative learning: Meta-analysis and critical synthesis.," *Rev. Educ. Res.*, vol. 87, no. 4, pp. 768–805, 2017.

15. R. D. Retnawati, H.; Apino, E.; Kartianom; Djidu, H.; Anazifa, *Pengantar Analisis Meta*. Yogyakarts: Parama Publishing, 2018.

16. D. Umutlu and Y. Akpinar, "Effects of different video modalities on writing achievement in flipped English classes.," *Contemp. Educ. Technol.*, 2020, [Online]. Available: https://eric.ed.gov/?id=EJ1252448.

17. Webb and Doman, "Does the flipped classroom lead to increased gains on learning outcomes in ESL/EFL contexts?," *CATESOL J.*, vol. 28, no. 1, pp. 39–67, 2016, [Online]. Available: https://bit.ly/36gSjOb.

18. I. Khadjieva, "Flipped classroom strategy effects on students ' achievements flipped classroom strategy effects on students ' achievements and motivation : Evidence from Cpfs level 2 students at Wiut," *Eur. J. Res. Reflect. Educ. Sci.*, vol. 7, no. November, pp. 120–130, 2019.

19. H. Alhasani, F. W. Mohd, and M. Masood, "The effect of flipped classroom with peer instruction on ESL students' reading comprehension and engagement," in *10th International Conference on ICT, Society and Human Beings*, 2017, pp. 27–34, [Online]. Available: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85040201297&partnerID=40&md5=10a82ba5fda6a3117cd98a74da6cfa17.

20. S. A. Ginting, "Flipped learning (FL) approach: Teaching academic writing skill to tertiary EFL learners," *J. Soc. Sci. Res.*, vol. 4, no. 12, pp. 582–590, 2018, doi: 10.32861/jssr.412.582.590.

21. G. Lee and A. Wallace, "Flipped learning in the English as a foreign language classroom: Outcomes and perceptions," *TESOL Q.*, 2018, [Online]. Available: https://onlinelibrary.wiley.com/doi/abs/10.1002/tesq.372.

22. W. Li and J. C. R. Tseng, "Engaging Students in a Flipped English Classroom by Conducting an Interactive Response System and Its Effects on Students' Learning Achievement and Learning Motivation," *2nd International Conference on Innovative Technologies and Learning, ICITL 2019*, vol. 11937 LNCS. Springer, Engineering Science, Chung Hua University, Hsinchu, 300, Taiwan, pp. 87–96, 2019, doi: 10.1007/978-3-030-35343-8_10.

23. W. C. V Wu, J. S. C. Hsieh, and J. C. Yang, "Creating an online learning community in a flipped classroom to enhance EFL learners' oral proficiency," *J. Educ. Technol. ...*, 2017, [Online]. Available: https://www.jstor.org/stable/90002170.

24. S. S. Al-Harbi and Y. A. Alshumaimeri, "The Flipped Classroom Impact in Grammar Class on EFL Saudi Secondary School Students' Performances and Attitudes.," *English Lang. Teach.*, 2016, [Online]. Available: https://eric.ed.gov/?id=EJ1113506.

25. S. Saidah, "The effectiveness of flipped classroom in teaching," *J. English Teach. Res.*, vol. 4, no. 2, pp. 193–206, 2019.

26. E. Cabı, "The impact of the flipped classroom model on students' academic achievement," *Rev. Res. Open Distrib. Learn.*, 2018, [Online]. Available: https://www.erudit.org/en/journals/irrodl/1900-v1-n1-irrodl03963/1051264ar/abstract/.

27. D. Saglam and A. Arslan, "The Effect of flipped classroom on the academic achievement and attitude of higher education students," *World J. Educ.*, vol. 8, no. 4, p. 170, 2018, doi: 10.5430/wje.v8n4p170.

28. J. Ho, "Gamifying the flipped classroom: how to motivate Chinese ESL learners?," *Innov. Lang. Learn. Teach.*, 2020, [Online]. Available: https://www.tandfonline.com/doi/abs/10.1080/17501229.2019.1614185.

29. A. F. Mubarok, B. Y. Cahyono, and U. P. Astuti, "Effect of flipped classroom model on Indonesian EFL students' writing achievement across cognitive styles," *Din. Ilmu*, vol. 19, no. 1, pp. 115–131, 2019, doi: 10.21093/di.v19i1.1479.

30. H. Alsowat, "An EFL flipped classroom teaching model: Effects on English language higher-order thinking skills, student engagement and satisfaction.," *J. Educ. Pract.*, 2016, [Online]. Available: https://eric.ed.gov/?id=EJ1095734.

31. P. Abedi, M. H. Keshmirshekan, and ..., "The comparative effect of flipped classroom instruction versus traditional instruction on Iranian intermediate EFL learners' English composition writing," *Journal of Applied ...* researchgate.net, 2019, [Online]. Available: https://www.researchgate.net/profile/Ehsan_Namaziandost/publication/335636035_The_C omparative_Effect_of_Flipped_Classroom_Instruction_versus_Traditional_Instruction_on _Iranian_Intermediate_EFL_Learners'_English_Composition_Writing/links/5d7134d7458 5151ee4.

32. C. J. Lin, G. J. Hwang, Q. K. Fu, and J. F. Chen, "A flipped contextual game-based learning approach to enhancing EFL students' English business writing performance and reflective behaviors," *J. Educ. Technol.* 2018, [Online]. Available: https://www.jstor.org/stable/26458512.

33. J. Cohen, "A power primer," *Psychol. Bull.*, vol. 112, pp. 155–159, 1992.

34. Y. J. Lin and H. C. Wang, "Using enhanced OER videos to facilitate English L2 learners' multicultural competence," *Computers & Education*. Elsevier, 2018, [Online]. Available: https://www.sciencedirect.com/science/article/pii/S0360131518301489.

35. P. Cheng, L., Ritzhaupt, A. D., & Antonenko, "Effects of the flipped classroom instructional strategy on students' learning outcomes: A Meta-analysis.," *Educ. Technol. Res. Dev.*, vol. 67, no. 4, pp. 793–824, 2019.

36. D. Slavin, R. E., & Smith, "Effects of sample size on effect size in systematic reviews in education.," *Educ. Eval. Policy Anal.*, vol. 31, no. 4, pp. 500–506, 2009.

37. H. D. Brown, *Teaching by principles*. repo.iainbatusangkar.ac.id, 2016.

38. J. C. Cooper, H., Hedges, L. V., Valentine, *The handbook of research synthesis and meta-analysis*. New York: Russel Sage Foundation, 2009.