

Flipped Learning Research Trends in English as a Foreign Language Classrooms: Systematic Reviews

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< ABSTRACT >

The purpose of this study was to systematically investigate flipped learning research trends in EFL classrooms and perform a meta-analysis to present the effect size integrated with flipped learning research trends in EFL classrooms between 2014 and 2018. To collect data, articles on the theme of flipped learning in EFL classrooms were searched from Social Sciences Citation Index (SSCI), and selection criteria were applied, which resulted in selecting the final 19 articles. The articles were analyzed through systematic review and meta-analysis, and the findings are as follows: First, the effect size of flip learning on academic achievement was found to be a large effect size. Second, as a result of systematic review, academic achievement was mainly used as a flipped learning outcome variable, and as affective variables, perception, satisfaction, and attitude about flip learning were used. Third, there were many studies mainly with university students as learners, and the number of studies showed steadily increasing. Based on the results of this study, suggestions for discussion and further studies were proposed.

Key Words : Flipped learning, English as a Foreign Language (EFL), systematic review, meta-analysis

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외국어로서 영어 교육에서의 플립러닝 연구동향: 체계적 문헌연구 중심으로

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< 요약 >

본 연구의 목적은 2014년부터 2018년까지 EFL 수업에서의 플립러닝 관련 논문을 체계적으로 연구동향을 분석하고 메타분석을 실시하여 EFL수업에서의 플립러닝 연구동향과 통합된 효과크기를 제시하는 데 있다. 이를 위하여 Social Sciences Citation Index(SSCI) 데이터베이스에서 EFL수업에서의 플립러닝 관련 논문을 검색 및 선정작업을 진행하였고, 최종 19개의 논문이 선정되었다. 이 논문들은 체계적 문헌연구방법과 메타분석을 통해 분석되었으며 분석결과는 다음과 같다. 첫째, 플립러닝의 학업성취도 효과크기는 큰 효과크기로 나타났다. 둘째, 체계적 문헌연구결과 주로 학업성취도가 효과변인으로 사용되었으며, 정의적 변인으로는 플립러닝에 대한 인식, 만족도, 태도 등이 사용된 것으로 나타났다. 셋째, 주로 대학생을 학습자로 한 연구들이 많았으며, 연구는 꾸준히 증가된 것으로 나타났다. 본 연구결과를 토대로 논의와 후속연구들을 위한 시사점을 제안하였다.

주요어 : 플립러닝, 외국어로서 영어 교육(English as a Foreign Language: EFL), 체계적 문헌연구, 메타분석

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I . Introduction

With the spread of COVID-19 over the world, dramatic changes have been observed in education in that classes have been held online. Due to online learning, several concerns have been raised such as student engagement (Sun & Rueda, 2012). Another challenge refers to the fact that learning cannot be actualized in its fullest sense unless learners practice things they learn (Dhawan, 2020). Flipped learning, at this point, offers learners with time to practice what they learn before the class, thus recently drawing increasing interest from both educators and researchers. This study focused on recent trends in research regarding flipped learning in the field of English as a Foreign Language (EFL). Hamdan et al. (2013) identified the main pillars of flipped learning as Flexible Environment, Learning Culture, Intentional Content, and Professional Educator (F-L-I-P). To begin with, Flexible Environment refers to learning environments designed by teachers both to enable students to learn when and where they choose and to allow teachers to exercise flexibility when assessing students' performances. Second, Learning Culture refers to the shift toward a student-centered approach where students become the center of learning rather than the product of teaching by engaging with the composition of knowledge and assessing their own learning. Learning Culture also involves enabling learners to regulate their learning pace before class so that teachers can make the most of in-class time to check students' understanding. Third, Intentional Content entails allowing teachers to decide what to teach directly in lectures and what to assign students to explore themselves outside of class, which facilitates effective use of in-class time. Finally, professional educator refers to the significant and demanding roles that teachers play selecting intentional content and observing, giving feedback to, and evaluating students on a regular basis. Professional educators should also be reflective, collaborate with others to improve classroom design, embrace constructive criticism, and allow for controlled disorder.

Based on these pillars, flipped learning can facilitate student development in EFL classrooms by fostering flexible environments that allow students to control their learning processes and teachers' decisions regarding teaching and assessment and by cultivating learning cultures that empower students to be the center of learning and learn at a strategic pace. Hamdan et al. (2013) reported that it can foster student development also by

ensuring the use of intentional content based on “various methods of instruction such as active learning strategies, peer instruction, problem-based learning, or mastery of Socratic methods, depending on grade level and subject matter” (p.6), and by employing professional educators to perform critical roles in shaping learning environments.

Numerous studies have examined the impact of flipped learning as an alternative teaching method in English classrooms (Huang & Hong, 2016; Jehma, 2016; Lee & Wallace, 2018) and various studies have noted that this method results in improved of academic achievement (Cabi, 2018; Lee, 2018). Many studies have also found that students have positive perceptions of flipped learning (Chen Hsieh et al., 2017; Hsieh et al., 2017; Hung, 2015; Lin & Hwang, 2018). Furthermore, some studies have reported that flipped learning favorably impacts student motivation and satisfaction (Hung, 2018; Lee, 2017; Lee et al., 2017; Zhai et al., 2017; Zhonggen & Guifang, 2016).

While several studies (Hung, 2015; Lin & Hwang, 2018) have generated positive findings, others have highlighted the downsides of flipped learning in classrooms. In a study conducted by Mehring (2015), participants pointed to a high amount of workload. Berrett (2012) indicated that the fact that teachers are required to address to students’ questions at the instant might be challenging for teachers. This way of learning also may not fit all students since some may prefer to only receive information instead of participating in producing it (Berrett, 2012).

Meanwhile, Strayer (2012) studied the learning environment in introductory statistics lessons at the university level, contrasting a flipped class with a traditional class, which resulted in learners in the flipped classroom being less content with the design of the classroom in terms of the learning tasks involved than those in the traditional classroom, although they were more positive about cooperative learning.

Bakla (2018) carried out a study with intermediate EFL students examining the effectiveness of materials created by learners in fostering active and inquiry-based learning and in leading to positive attitudes regarding flipped learned. They pointed out that some students, especially low achievers accustomed to traditional teaching methods, struggled to get used to the flipped classroom, making it necessary for teachers to spare time to prepare them beforehand. Additionally, there might be students who would not complete pre-class tasks or would be too shy to participate (Mehring & Leis, 2018).

Flipped learning can be employed to promote learning domains which refer to cognitive,

affective, and social domains. Cognitive learning refers to recognizing and recalling related knowledge from long-term memory (Krathwohl, 2002). The six stages of cognitive domains are (a) remember, (b) understand, (c) apply, (d) analyze, (e) evaluate, and (f) create (Krathwohl, 2002). As for affective learning, Rubin (2010) defined it as the degree “how much students like the teacher and class” (p. 43).

Affective domain is composed of values, attitudes, and behaviors (Shephard, 2008). The stages are given as (a) receive, (b) respond, (c) value, (d) organize, and (e) characterization (Ramalingam et al., 2014). When it comes to social learning domains, Dettmer (2005) defined it through society which is “a form of regular and repeated order in which individuals interact, and in doing so learn from and support one another” (p. 75). Social domain is about sociocultural interactions in classrooms and relevant settings to classrooms (Dettmer, 2005). Interaction and communication are important elements and its stages are (a) relate, (b) communicate, (c) participate, (d) negotiate, (e) adjudicate, (f) collaborate, (g) initiate, and (h) convert (Dettmer, 2005).

Additional investigation of this topic would benefit EFL teachers who want to flip their classrooms by providing them with ideas regarding what to do and what to avoid when seeking to create effective flipped classrooms (Bui, 2018). Although many scholars have pointed out both the effectiveness of flipped learning in EFL classrooms and some related challenges, there is a dearth of research in the current body of literature to identify trends in flipped EFL classrooms. This study investigated current trends in research regarding flipped learning in EFL classrooms, undertaking a systematic review of current articles. In doing so, it sought to highlight the recommendations put forth in existing research regarding the cultivation of effective flipped learning in EFL classrooms. Moreover, it set out to identify the gaps in current research and examine the implications of these gaps for future studies. Systematic reviews are significant in that they make unmanageable amounts of information into a well-organized group of information (Mulrow, 1994) so that educators and researchers can be guided to set grounds for further studies (Turan & Akdag-Cimen, 2019). Meta-analysis enables for drawing conclusions regarding the direction between variables as well as the direction about the required research in the field and directions to be taken for future studies (Borenstein et al., 2011; Cho, 2017). Thus, this study aimed to examine flipped learning research trends in EFL classrooms systematically and present the effect size integrated with flipped learning research trends by performing a meta-analysis.

The research questions are as follows:

What are the trends in flipped EFL classroom research?

What are the main learning outcomes in flipped EFL classrooms?

What is the overall effect size of flipped learning in EFL on academic achievement?

II. Theoretical Background

The term ‘flip’ refers to the way the conventional classroom which is flipped (Mehring, 2018). Bergmann and Sams (2012) described flipped classes as involving the completion of activities normally performed in the conventional classroom at home and the completion of activities usually completed at home in the classroom. They also defined the roles of learners and instructors in flipped classrooms: learners in flipped classes are supposed to go to class having thought of the parts of the lessons that require further explanation beforehand and then to complete the activities assigned during the class (Bergmann & Sams, 2012); meanwhile, instead of presenting the content, teachers are expected to guide the students as facilitators (Bergmann & Sams, 2012). When the students are working on given assignments, the teachers walk around the classrooms and monitor their comprehension instead of leaving them to deal with the new concepts at home (Berrett, 2012). Berrett (2012) further emphasized the role of teachers in providing feedback to students right on the spot as well as in motivating them to concentrate on their tasks. Thanks to flipped classrooms, “class time is freed up for other instructional activities” (Enfield, 2013, p. 14), making the classroom a place that fosters active and collaborative learning (Roach, 2014). Mehring (2018) indicated that technology is not necessarily a requisite to flip the classroom and that it is feasible to get the classroom flipped without videos and technology. However, it has become easier to flip the classroom owing to the technology’ s affordances (Mehring, 2018).

Flipping classrooms gives teachers the opportunity to personalize the learning processes of students, leading to individualized learning (Bergmann & Sams, 2012). It also encourages learners to control their learning—they are expected to watch the videos, prepare questions before class, and complete and share their assignments; the student-centered design thus functions by empowering self-directedness (Bergmann & Sams, 2012). The flipped classroom

also facilitates the transfer of information by ensuring that students are assisted in assimilating information (Berrett, 2012). Moreover, flipped classrooms give students the opportunity to collaborate with their peers so that they can identify more than one way to figure out problems (Berrett, 2012). Hence, flipping classrooms reinforces student-student interactions as well as student-teacher interactions, and teachers can get to know their students better (Bergmann & Sams, 2012). Teachers can use various methods including videos and readings to cover the lectures students must study before class. Enfield (2013) encouraged teachers to use video lessons because it reduces both preparation and remediation time for each class, although creating the videos lasts a long time. Video lessons enable students to study the subject matter at their own pace since they can stop the videos at any time and even rewind them if necessary (Enfield, 2013). Saeidi and Ahmadi (2016) conducted an experimental study with EFL learners examining the impacts of videos at the pre-reading stage on reading comprehension. They noted that the experimental group performed better than the control group and the attitude of the learners were positive towards watching videos during pre-reading stage.

Bloom's (1956) theory of revised taxonomy serves as the theoretical foundation of flipped classrooms (Krathwohl & Anderson, 2009). The taxonomy consists of six levels in which the degree of abstraction increases with each successive level, so teachers need to guide their students up through the taxonomy as their learning processes proceed (Bloom, 1956). Based on this schema, students are expected to complete inferior level cognitive skills (remembering and understanding) at home prior to class, whereas higher level cognitive skills (applying, analyzing, evaluating, and creating) are supposed to be reinforced in-class.

A psychological case study by Ryback and Sanders (1980) was carried out to explore the influence of humanistic and traditional teaching styles on learner satisfaction in a psychology class. The learners were put to humanistic (learner-centered) group or conventional (teacher-centered) group. It was revealed that internal scorers would rather a more humanistic approach, whereas external scorers would rather a more structured approach. Thus, it can be argued that students' characteristics should be analyzed before any kind of implementation to see which learners favor learner-centered environment and which students favor teacher-centered environment. This argument should be taken into account in flipped classrooms.

So far, very few researchers have used meta-analysis to examine flipped learning. Hew and Lo (2018) compared the influence of flipped classrooms on students' learning to that of traditional classrooms by focusing on healthcare professionals such as medical students, doctors, nurses, and so forth. Their analysis of 28 eligible articles showed that flipped classrooms had a significantly more favorable effect (95% CI 0.21-0.46) than traditional classrooms for healthcare professionals. Moreover, their findings suggested that employing quizzes at the beginning of in-class sessions is more effective. Notably, participants who preferred flipped classrooms also outnumbered those who preferred traditional classrooms. In addition, several literature reviews have examined the effects of flipped classrooms. Hamdan et al. (2013) reviewed existing literature on flipped learning and noted that the Flipped Learning model provides a framework for turning classrooms into active, personalized, and learner-centered environments although flipping classrooms is not the only way to solve the problems that occur while teaching. Because the dynamic nature of language learning means that learner-centered environments in EFL classrooms can improve students' performances, this study's findings could have important implications for teachers who are willing to empower learners. In addition to the favorable effects of flipped learning, different scholars have raised some concerns regarding this approach including the excessive emphasis it places on homework and lectures, the possibility that videos will replace teachers, and the uneven opportunities students have while accessing to technology.

Turan and Akdag-Cimen (2019) carried out a systematic review about flipped classroom in English language teaching (ELT) with 43 articles between 2014 and 2017. They revealed that there was an abrupt rise in the number of the papers by the year of 2014 until 2017. It was also reported that mixed and quantitative methods were the most frequently used research methods. In addition, speaking and writing skills were most frequently studied language skills. They also reported that student engagement was one of the most frequently referred benefits of flipped learning. Moreover, they noted that extra workload for both students and teachers was reported as challenges of this method. In addition to these points, this review further elaborates on the effect size of flipped learning on learners' academic achievement, the most commonly studied language levels, intervention durations of flipped classrooms, video usage, pre-class materials and activities as well as post-class materials and activities.

Zainuddin and Halili (2016) examined 20 articles written between 2013 and 2015 to identify flipped classroom trends and content from diverse disciplines. They reported that favorable results have been obtained in achievement, motivation, engagement, and interaction in diverse fields. Besides they revealed that flipped learning have been employed by various areas corresponding to not only science courses but also social courses (information systems, chemistry, economics, statistics, calculus, English language, and so on). They recommended that more studies should focus on these areas and foreign language learning as well as English are among these areas requiring further investigation. They also suggested that future studies place greater emphasis on in-class activities since these activities are supposed to contribute to learners' critical and creative thinking skills. Additionally, they noted that videos should include engaging elements such as animation and music so that students can be immersed in the learning materials. These findings are significant because they highlight the need to focus deeply on common classroom practices in EFL to establish a framework for teachers.

III. Methods

1. Data Collection and Selection Criteria

This systematic review was conducted in two stages. The first stage was data collection, which involved searching the Social Sciences Citation Index (SSCI) for academic articles published in the last five years (2014, 2015, 2016, 2017, and 2018). SSCI was used because it fit the criteria of including refereed journals that were indexed by prominent database. The following keywords were used to locate an extensive range of eligible studies: Flipped learning AND language learning, English language course AND flipped classroom, flipped classroom AND alternative future class model, flipped classroom model AND personalized learning, flipped classroom AND Business English, flipped classroom AND ICT. Sixty-five total studies were located via these searches.

Next, inclusion and exclusion criteria were added to obtain the articles to be analyzed. The first step in this process was to include studies carried out in EFL contexts that implemented flipped learning in the classrooms. This was achieved by reviewing the titles

and abstracts of the studies. At the end of the first step, 35 studies were excluded because they were about flipped learning but had teachers or other subjects as the focus such as Chinese, Spanish, programming language, physics, and so on. The excluded studies also included studies that did not implement flipped learning or that were based solely on survey design. Thus, the total number of the remaining studies was 30. The second step in the inclusion and exclusion process was to exclude duplicated studies. At the end of second step, 10 studies were excluded. The exclusion criteria also included qualitative studies, and one of the remaining studies was qualitative. The final dataset thus included 19 studies. Of the 19 selected articles, 8 were published in 2018, 8 in 2017, 2 in 2016, 1 article in 2015, and none in 2014 (see Figure 2). The articles came from the following journals: Interactive Learning Environments, Language Learning & Technology, TESOL QUARTERLY, EURASIA Journal of Mathematics Science and Technology Education, British Journal of Educational Technology, Journal of Computer Assisted Learning, ELT Journal, Computers & Education, Computers in Human Behavior, Educational Technology & Society, Educational Technology Research and Development, Computer Assisted Language Learning.

2. Coding Framework

The 19 selected articles were coded and analyzed according to a coding framework adapted from Cho (2018); this framework consists of (a) the general characteristics of the study and (b) the design characteristics of the study. The general characteristics of the study provides brief information about the title, the author(s), the year of issue, journal, and research methods of the studies. Next, the design characteristics of the study provides detailed information about the studies' aims, procedures, and participant types. To establish inter-rater reliability, 10 out of 19 papers were selected at random and independently coded by two researchers. Microsoft Excel was used to analyze two code sets to find determine Cohen' s Kappa coefficient value. It was revealed to be 0.89, which indicates agreement between researchers based on the study by Viera and Garrett (2005). Besides, the rest of the articles were discussed by two researchers and a compromise was reached.

IV. Results

1. Trends in Flipped EFL Classrooms

Table 1

Summary of trends in flipped EFL learning

| The studies | Countries | Research method | Level of participants |
|---|-----------|-----------------|-----------------------|
| 1. Learner-generated materials in a flipped pronunciation class: A sequential explanatory mixed-methods study | Turkey | mixed method | university |
| 2. Gamifying the flipped classroom using game-based learning materials | Taiwan | mixed method | university |
| 3. A Flipped Contextual Game-Based Learning Approach to Enhancing EFL Students' English Business Writing Performance and Reflective Behaviors | China | mixed method | university |
| 4. Flipped classroom as an alternative future class model?: implications of South Korea's social experiment | S. Korea | mixed method | primary |
| 5. A Learning Analytics Approach to Investigating Factors Affecting EFL Students' Oral Performance in a Flipped Classroom | Taiwan | mixed method | university |
| 6. Flipped Learning in the English as a Foreign Language Classroom: Outcomes and Perceptions | S. Korea | mixed method | university |
| 7. Designing a technology enhanced flipped learning system to facilitate students' self regulation and performance | Taiwan | quantitative | university |
| 8. Which students benefit most from a flipped classroom approach to language learning? | Taiwan | quantitative | university |
| 9. TELL us ESP in a Flipped Classroom | Taiwan | mixed method | university |
| 10. Technological acceptance of LINE in flipped EFL oral training | Taiwan | mixed method | university |
| 11. Creating an Online Learning Community in a Flipped Classroom to Enhance EFL Learners' Oral Proficiency | Taiwan | mixed method | university |
| 12. Design-Based Research: Redesign of an English Language Course Using a Flipped Classroom Approach | Taiwan | quantitative | university |
| 13. The integration of a student response system in flipped classrooms | Taiwan | quantitative | university |
| 14. Clickers in the flipped classroom: bring your own device (BYOD) to promote student learning | Taiwan | mixed method | university |
| 15. Using the flipped classroom to enhance EFL learning | Taiwan | mixed method | university |
| 16. An Experiential Learning Perspective on Students' Satisfaction Model in a Flipped Classroom Context | China | quantitative | university |
| 17. Academic Achievements and Satisfaction of the Clicker-Aided Flipped Business English Writing Class | China | mixed method | university |
| 18. The effects of a flipped English classroom intervention on students' information and communication technology and English reading comprehension | Taiwan | mixed method | high school |
| 19. Flipping the classroom for English language learners to foster active learning | Taiwan | mixed method | university |

The use of flipped learning has clearly increased over the years. Although this study included no articles from 2014, the number of studies of flipped learning slowly increased from 1 article in 2015 to 2 articles in 2016. Thereafter, the yearly rate of increase became more rapid with 8 articles in 2017 and 8 articles in 2018. As for countries, 13 studies out of 19 were conducted in Taiwan, 3 in China, 2 in Korea, and 1 in Turkey. This review only considered studies that employed quantitative or mixed methods approaches to provide empirical evidences on the effectiveness of flipped learning in EFL classrooms. Fourteen out of 19 studies used mixed-method approaches while 5 studies employed quantitative methods. In addition, Seventeen out of 19 studies were carried out in universities, 1 was conducted in a high school, and 1 was conducted in a primary school. According to the findings, flipped classrooms are mostly utilized at the university level in the EFL context. Table 1 presents a summary of these trends regarding flipped learning in EFL classrooms.

2. Flipped Learning Outcome Variables

This review analyzed the cognitive domains of learning that the studies in question considered. This analysis showed that 16 of the studies examined the academic performance of students who experienced flipped learning by employing pre- and post-tests. Academic performance was the most examined variable in the studies. Only one study investigated how students' self-regulation skills improved thanks to flipped learning experience.

Based on the affective domain data, 7 of the studies examined the perceptions of the students regarding flipped classrooms, 4 examined students' satisfaction with flipped classrooms, 3 examined students' attitudes towards learning in flipped classrooms, 2 examined students' motivation for learning in flipped classrooms, 2 examined students' participation to the lessons in their flipped classroom, 2 examined student engagement in flipped classrooms, 1 examined the self-efficacy skills of students in flipped classrooms, 1 examined students' preferences when it came to the gamification elements integrated into the flipped classrooms, and 1 examined students' perspectives regarding flipped classrooms. These results indicate that students' perceptions and satisfaction are trend-dependent variables in the affective learning domain. In addition, this review analyzed the social domains of learning that the studies in question considered. Only one

study examined students' communication skills in the flipped classroom.

3. Flipped Learning Achievement

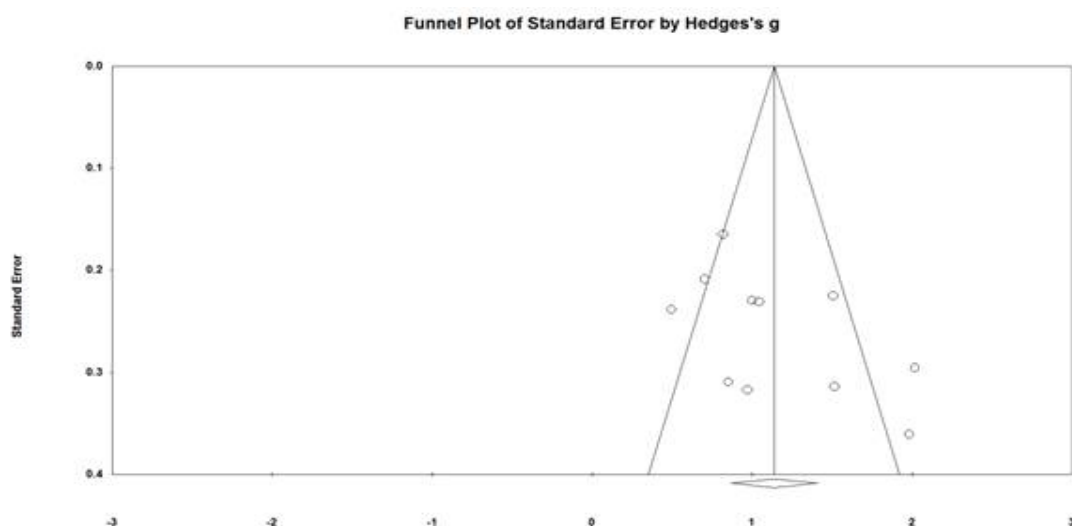
Among the 19 studies, 11 studies (see Appendices) employed pre- and post-tests to determine whether the students in the experimental groups learning in flipped classrooms performed better than those in the control groups with regards to learning outcomes. All 11 found that students exhibited significantly higher academic performance on several tests after having experienced flipped learning, meaning flipped learning contributed to effective learning.

3.1 Analysis of Publications

The publication bias was visually examined by using the funnel plot. The analysis shows that there is no publication bias due to symmetry on the graph. The funnel plot is shown in Figure 1. After visual examination, Egger's regression test was conducted to investigate the asymmetry of funnel plot through statistical analysis. Egger's regression test, the most frequently employed method for statistical verification of asymmetry,

Figure 1

Funnel Plot



verifies the publication bias in a statistical way when it is assumed that there is a publication bias subjectively, which illustrates the relation between the effect size and the standard error in each study in a regressive method (Cho, 2018). If p -value of the intercept of the regression equation is statistically significant, it can be stated that there is an error in rejecting the null hypothesis that the intercept is an accidental result (Hwang, 2016). Since regression model's p -value was not statistically significant ($t = 2.00$, $df = 9$, $p = .07$), the null hypothesis that there is no relationship between effect size and standard error was not rejected. Namely, the null hypothesis that intercept was an accidental result was not rejected, which can be claimed to be error-free.

3.2 Homogeneity Test

Assuming that the effect sizes of individual studies were derived from the same population, the homogeneity test showed that the Q value was 34.298, so statistically the interstudy effect was not homogeneous ($p = .00$). The effect size's 95% confidence interval excluded 0, which was revealed to be statistically significant. According to Higgins and Green (2011), low level of heterogeneity is shown if I^2 value is 25%, medium level if 50%, and high level if 75%. In this study, a medium level of heterogeneity was revealed with the I^2 value was 70.8%. Considering the results and the subjects as well as the contents of the study analyzed, individual studies were decided to be heterogeneous. Thus, random-effects model was used.

3.3 The Overall Mean Effect Size of Flipped Learning Achievement

When the samples in meta-analysis study refer to the same size, fixed effects model ought to be chosen. However, random effects model needs to be chosen when they address different size. For the selection of the model in this study, p and Q values are taken into account. Hence, the significant value's size based on (p) .05 or Q value's size based on df value in the chi-square table are investigated. Accordingly, the fact that the articles scanned in this meta-analysis are identical and carry a homogeneous structure can be deduced in the event of $p > .05$ or $Q < df$, suggesting the implementation of fixed effects model for the statistical model. In the event of $p < .05$ or $Q > df$, the fact that the articles

constituting meta-analysis are not identical and carry a heterogenous structure might be deduced, implying the application of random effects model for the statistical model. This study utilized random effects model while selecting the statistical model depending on the findings.

The papers included in this meta-analysis present diverse effect sizes. This diversity is required to perform the study statistically. Heterogeneity tests are implemented for discovering if the effect sizes are suitable to normal distribution. Thus, this study applied heterogeneity tests. The overall effect size values of the papers scanned in this meta-analysis based on fixed and random effects model are illustrated in Table 2. Accordingly, this study revealed 11 effect sizes for a total of 11 articles. The overall effect size measured by random-effects model was 1.13, whereas it was calculated as 1.06 by fixed effects model. On the other hand, Q value which is calculated by employing homogeneity test showed the distribution of the effect size in terms of academic achievement has a heterogeneous form. Based on this finding, random effects model was applied. The overall effect size can be reported as statistically significant because 0 was excluded within the confidence interval (Hwang, 2016). If the mean effect size is analyzed based on the standards of Cohen (1988), it can be reported that flipped learning has a large effect on the students' learning outcomes ($ES \geq .80$).

Table 2

Measurement of effect size by fixed and random effects model

| Variable | Model | K | ES(g) | U3 | 95% CI | | Q | df | p | I2 |
|------------------|---------------|----|-------|-------|--------|-------|--------|----|-----|--------|
| | | | | | Lower | Upper | | | | |
| Flipped learning | Fixed effect | 11 | 1.06 | 85.54 | .91 | 1.20 | 34.298 | 10 | .00 | 70.844 |
| | Random effect | 11 | 1.137 | 87.08 | .86 | 1.41 | | | | |

Note. K= Number of the articles; ES(g)=Effect size(Hedges' g); U3 = cumulative distribution value of effect size; 95% CI=95% confidence interval; Q= level of observed distribution (variance); df= variance based on the effect size of the same population; I² = ratio of actual variance compared to overall variance.

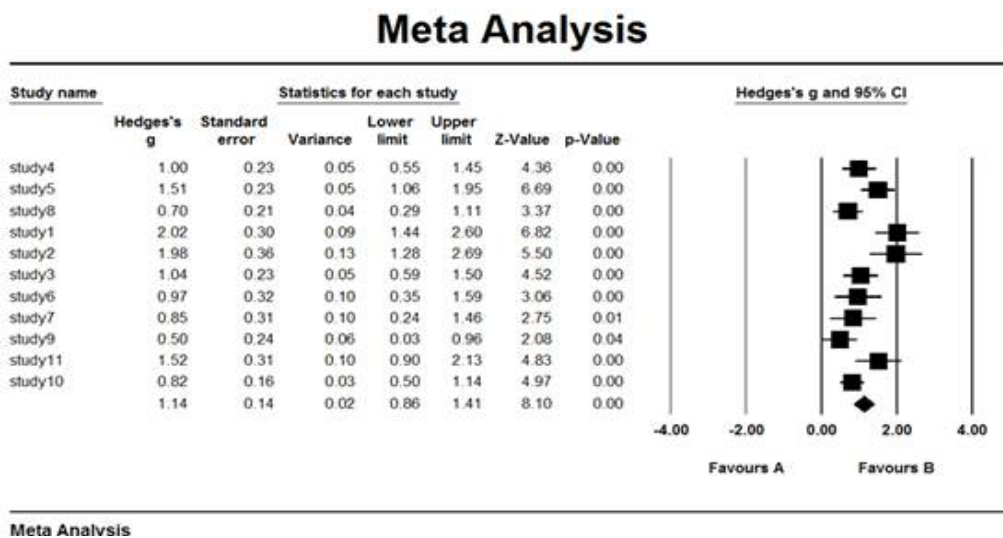
As in Table 2, Q value that shows the homogeneity verification results is 34.298 ($p < .05$), which indicates that the samples of the studies are not homogeneous. In addition, the I2

value which shows the ratio of the variance between the studies compared to the overall variance is 70.844, which presents a medium level of heterogeneity. As such, the overall mean effect size of flipped learning based on random-effects model is 1.137.

Moreover, if the effect size is analyzed through the U3 index, it can be seen that the U3 value of 87.08% tile obtained from the meta-analysis showed an improvement of 37.08% in the flipped learning group when the mean percentage of the control group was 50% tile in the normal distribution curve. Based on Forest plot, the results regarding effect size of individual study, confidence intervals, and overall mean effect size are given in Figure 5. Forest plot not only portrays the estimation of the overall effect size among studies indicating how many studies are combined, but also reveals if publication bias exists through the results of the meta-analysis (Cho, 2018). Figure 2 shows that the effects of the individual studies are mostly distributed between 0 and 2.0.

Figure 2

Forest Plot



V. Discussion

The findings of this analysis illustrated that the number of the articles focusing on flipped learning in EFL progressively increased since 2014, which seems to be due to the

affordances of flipped classroom and implies that it will gain even more popularity. It was also found that there are studies conducted from several countries and the majority of the studies comes from Taiwan. More studies need to be conducted in other countries to offer more insights into the flipped learning in EFL contexts.

The analysis showed that the vast majority of the participants comes from university students. Considering the fact that most flipped learning practices consist of technology use although it is not necessarily compulsory, university students might have met the requirements of the researchers as it is more convenient to access to technology for university students. Also, Bakla (2018) indicated that young learners may not be good at using technology leading researchers to study with adult learners. Another reason might be ascribed to the fact that university students are more suitable for student-centered environments as they can monitor and control their learning process better along with fostering their higher order thinking skills. Nevertheless, Cho (2018) revealed that the effect size of flipped learning was the highest with high school students and suggested that this might have resulted from the fact that high school students are better self-directed learners comparing to primary or secondary school students. Thus, researchers are recommended to focus on other level of learners such as high school students to attain the most effective outcomes and primary or secondary school students to present effective and efficient guidelines for teachers to follow.

The results of this analysis indicated that flipped learning was effective in EFL classrooms in terms of academic achievement; all relevant studies (Hsieh et al., 2017; Lin et al., 2018; Zhonggen & Guifang, 2016) found that students' academic achievement improved significantly. Based on the results from meta-analysis of 11 articles having focused on academic achievement, flipped learning was reported to have a large effect on the students as the overall mean effect size of flipped learning based on random-effects model is 1.137. These results should encourage teachers who consider deploying flipped learning in their classrooms but have hesitated to do so out of concern that it might not produce positive learning outcomes.

Next, most of the studies in question investigated perceptions regarding flipped learning experiences and satisfaction with flipped classrooms in terms of affective domains. These studies (Chen Hsieh et al., 2017; Hung, 2017) showed statistically significant differences between traditional and flipped classroom groups regarding perceptions and satisfaction.

This implies that EFL students perceive flipped learning as a positive method of learning and are satisfied with the learning outcomes it produces. Thus, more teachers should integrate flipped learning to foster active and student-centered environments in their classrooms.

On the other hand, now that there is some amount of research on how students perceive flipped learning, more emphasis should be put on how to engage the learners better in a flipped classroom and motivate them to stay on task throughout the learning process. Cui et al., (2019) touched upon the problem of academic engagement of learners in pre-class learning along with the need for learners to take responsibility in their learning and control their learning process. Lee et al., (2019) also pointed out the necessity of involving learners to participate actively in-class and giving them the lead, whereas teachers mediating when necessary to enhance classroom satisfaction. In the classroom, some short-term benefits (e.g. assigning grade) need to be given to the students for their active participation (Bakla, 2018).

As for social domains, the studies are scarce in the literature. It was revealed that the social domains of learning have received less attention from researchers, despite the fact that communication (Peng & Woodrow, 2010) and interaction (Al-Zahrani & Al-Bargi, 2017) are very important in EFL classrooms. Cho (2018), however, found that social domains showed a small effect size and called for instructional design strategies and implementation measures to increase the learning effects. She recommended preparing an online environment that activates interaction, having small group works and discussions, and offering learners with opportunities to present their ideas and works.

It is worth noting that flipped learning may be challenging for instructors in terms of workload, thus requiring cooperation with fellow instructors to save time and energy (Turan & Akdag-Cimen, 2019). In addition, Turan and Akdag-Cimen (2019) found that internet related problems pose the biggest challenge in flipped EFL classrooms and suggested to make sure there is no problem with accessing the required technology.

VI. Conclusion

This systematic review contributes to the growing literature by offering insights on how to employ flipped learning in EFL classrooms more effectively. It also encourages the

researchers to conduct more studies on this subject and practitioners to employ this method in their teaching. The findings of this work revealed that flipped learning has a large effect on the students since the overall mean effect size of flipped learning based on random-effects model is 1.137. Hence, more actions should be taken to implement flipped learning into EFL classrooms. Besides, it suggests that flipped learning in EFL appears to be popular in Taiwan and should be put more emphasis in other countries as well. It was revealed that learners generally had positive perceptions of flipped classrooms and were satisfied with their experiences. A high engagement and participation in class were observed as well as high motivation. Thus, practitioners are encouraged to employ flipped learning in EFL classroom to have learners involved in the learning process. Communication and interaction are significant elements for English classes, yet there is a dearth of study focusing on these social domains. Flipped learning has mostly been employed with university students and it can also be easily employed in other levels considering that technology integration is not compulsory.

Despite its contributions, this study also had several limitations. To systematically identify existing research trends, it searched only one database and only English journals. Thus, it may have missed significant points in other languages and sources. A majority of the articles under consideration analyzed the influence of flipped learning on the cognitive and affective domains of learning, focusing especially on academic achievement, students' perceptions, and student satisfaction. Moreover, this review consisted of studies employing either quantitative or mixed methods. Hence, there might be some important points or insights missed from qualitative studies. Another limitation is the fact that this review only included studies focusing on students, which might have fallen short of significant perspectives of other groups such as teachers. Future studies should consider examining the social domains of learning—including communication, interaction, and collaboration skills—more extensively. These are among the most important skills in EFL classrooms as students learn English to communicate with others. Focusing on these skills will foster their interaction and collaboration skills, which could bolster their language skills. In addition, the fact that most of the studies in question examined flipped learning with university students highlights the lack of studies of younger groups; thus, educators and researchers should broaden their investigations to take the influence of flipped learning on young learners into consideration.

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Appendices

| No | Articles |
|----|---|
| 1 | A Flipped Contextual Game-Based Learning Approach to Enhancing EFL Students' English Business Writing Performance and Reflective Behaviors |
| 2 | A Learning Analytics Approach to Investigating Factors Affecting EFL Students' Oral Performance in a Flipped Classroom |
| 3 | Designing a technology enhanced flipped learning system to facilitate students' self-regulation and performance |
| 4 | Technological acceptance of LINE in flipped EFL oral training |
| 5 | Creating an Online Learning Community in a Flipped Classroom to Enhance EFL Learners' Oral Proficiency |
| 6 | Design-Based Research: Redesign of an English Language Course Using a Flipped Classroom Approach |
| 7 | Clickers in the flipped classroom: bring your own device (BYOD) to promote student learning |
| 8 | Using the flipped classroom to enhance EFL learning |
| 9 | Academic Achievements and Satisfaction of the Clicker-Aided Flipped Business English Writing Class |
| 10 | The effects of a flipped English classroom intervention on students' information and communication technology and English reading comprehension |
| 11 | Flipping the classroom for English language learners to foster active learning |