A meta-analysis of graduate research on teaching strategies used for improving thai students' english skills

การวิเคราะห์อภิมานงานวิจัยระดับบัณฑิตศึกษาเกี่ยวกับกลยุทธ์การสอนที่ใช้ในการพัฒนาทักษะภาษาอังกฤษของนักเรียนไทย

รุ่งฤดี กล้าหาญ[1] สุชารัช ริมกีรติกุล[2]

Rungrudee Klaharn[1] Sucharat Rimkeeratikul[2]

[1]นักศึกษาปริญญาโท สถาบันภาษา มหาวิทยาลัยธรรมศาสตร์

Master degree, Language Institute, Thammasat University

Corresponding author, E–mail: rungrudee@g.swu.ac.th

[2]รองศาสตราจารย์ ดร. สถาบันภาษา มหาวิทยาลัยธรรมศาสตร์

อาจารย์ที่ปรึกษาวิทยานิพนธ์

Associate Professor, Ph.D., Language Institute, Thammasat University

E–mail: sucharat.r@litu.tu.ac.th

บทคัดย่อ

　　　　　การวิจัยนี้เป็นการวิจัยเชิงปริมาณ มีวัตถุประสงค์เพื่อ 1) วิเคราะห์ลักษณะงานวิจัยระดับบัณฑิตศึกษาเกี่ยวกับกลยุทธ์การสอนที่ใช้ในการพัฒนาทักษะภาษาอังกฤษของนักเรียนไทย 2) ประเมินคุณภาพของงานวิจัยระดับบัณฑิตศึกษา และ 3) เปรียบเทียบลักษณะงานวิจัยระดับบัณฑิตศึกษากับดัชนีมาตรฐาน ตัวอย่างการวิจัยคือวิทยานิพนธ์ในมหาวิทยาลัยของรัฐแห่งหนึ่งที่ศึกษาโดยใช้รูปแบบการวิจัยเชิงทดลองตีพิมพ์ภาษาอังกฤษ และตีพิมพ์ในปี 2547-2563 จำนวน 22 ฉบับ เครื่องมือที่ใช้ในการวิจัย ได้แก่ แบบบันทึกข้อมูลและแบบประเมินคุณภาพงานวิจัย วิเคราะห์ข้อมูลโดยใช้สถิติ t-test และ one-way ANOVA ผลการวิจัยพบว่า งานวิจัยระดับบัณฑิตศึกษาส่วนใหญ่เน้นศึกษาเกี่ยวกับคำศัพท์เป็นหลัก (31.81%) กลยุทธ์การสอนที่ใช้มากที่สุดคือสื่อการสอน (72.72%) ตัวอย่างวิจัยส่วนใหญ่ศึกษากลุ่มนักเรียนระดับมัธยมศึกษา (63.63%) งานวิจัยระดับบัณฑิตศึกษาจำนวน 18 เรื่อง มีคะแนนรวมอยู่ในระดับที่สูงมาก และจำนวน 4 เรื่องมีคะแนนรวมในระดับสูง การเปรียบเทียบลักษณะงานวิจัยระดับบัณฑิตกับดัชนีมาตรฐาน พบว่า ตัวแปรด้านขนาดตัวอย่างมีความแตกต่างอย่างมีนัยสำคัญที่ระดับ .05 ส่วนเทคนิคการสุ่มตัวอย่างมีความแตกต่างอย่างมีนัยสำคัญทางสถิติที่ .01 ดังนั้น ความแตกต่างของตัวแปรเหล่านี้จึงส่งผลต่อความแตกต่างของผลสัมฤทธิ์ทางการเรียนของนักเรียน การวิเคราะห์อภิมาน พบว่า ตัวแปรขนาดกลุ่มตัวอย่างที่มีค่าเฉลี่ยขนาดอิทธิพลสูงที่สุดคือ กลุ่มนักเรียน 30-39 คน โดยมีค่าเฉลี่ยขนาดอิทธิพล 3.23 ดังนั้น การสอนในห้องเรียนที่มีนักเรียน 30-39 คน จะส่งผลให้ผลสัมฤทธิ์ทางการเรียนดีกว่าห้องขนาดอื่น ๆ สำหรับเทคนิคการสุ่มตัวอย่างที่มีค่าเฉลี่ยของขนาดอิทธิพลสูงที่สุด คือ การสุ่มตัวอย่างแบบสะดวก รองลงมาคือ การสุ่มตัวอย่างอย่างง่าย และ การสุ่มตัวอย่างแบบเจาะจง โดยมีค่าเท่ากับ 3.02 1.39 และ 1.33 ตามลำดับ

คำสำคัญ: การวิเคราะห์อภิมาน งานวิจัยระดับบัณฑิตศึกษา กลยุทธ์การสอน ทักษะภาษาอังกฤษ นักเรียนไทย

Abstract

This is study aimed to 1) analyze the characteristics of graduate research on teaching strategies used for improving the English skills of Thai students; 2) evaluate the quality of the aforementioned graduate research, and 3) compare the characteristics of the graduate research to the standard index. A total of 22 experimental graduate research reports written at one public Thai university in English and published in 2004-2020 were synthesized. The research design was quantitative. The research instruments were a recording form and an evaluation form. The data were analyzed using descriptive statistics, t-test, and one-way ANOVA. The results showed that graduate research mostly focused on vocabulary (31.81%). The types of strategy were used the most was teaching materials (72.72%). Secondary school was the highest levels of students' education in the research (63.63%). Eighteen studies had a total score at a very high level, and four studies had a total score at a high level. The sample size had a significant effect on effect size at the level of .05, whereas the sampling technique affected effect size at the statistically significant level of .01. Thus, the difference in these variables affected the difference in learning achievement. The meta-analysis found that the sample size variable with the highest mean effect size was 30-39 students, with an average effect size of 3.23. Teaching in a classroom of 30-39 students will therefore lead to better academic achievement than other room sizes. For sampling technique, convenience sampling had the highest mean effect size at 3.02, followed by simple random sampling at 1.39 and purposive sampling at 1.33.

Keywords: meta-analysis, graduate research, teaching strategy, English skills, Thai students

1. Introduction

English is one of the most important global languages, and the demand for highly proficient English communicators is increasing. There are six official languages in the193-member United Nations. English is one of the six official languages. Most global scientific research is published in English. Of the more than 21,000 papers from 239 countries in the database, studies have revealed that in excess of 80% were written completely in English (Huttner-Koros, 2015), and 96% of papers in science journals were published in English. English is spoken by about two billion people and is one of the most important global languages. This is partly due to technology, especially the internet for world communication and searching for information. (Sirithararatn, 2007). Therefore, learning English is a crucial issue for many countries, including Thailand. (Imsa-ard, 2020a; Teansriratchagul, Pattanasith, & Srifa, 2022).

Thai students were found to be at a fairly low level, based on the Test and Score Data Summary for TOEFL Internet-Based and Paper-Based Tests (Educational Testing Service, 2011). According to the Education First English Proficiency Index (EF EPI, 2019), Thailand ranks 74th out of 100 countries. Moreover, students have had a mean English score below 50 on the Ordinary National

Education Test (O-NET) have been over the last half-decade (Imsa-ard, 2020b; Thupatemee & Kunarak, 2022). Thai students' English learning skills need to be improved.

Consequently, educational institutes at all levels have realized and responded to this urgent need, and many Thai teachers have studied effective techniques for improving the English communication skills of the learners. For example, Sriha (2020) used movies and short clips for development students' pronunciation. Natawetch (2020) designed a flipped classroom to improve grammatical competence and writing skill. Most of the prior research has focused on strategies for improving the English skills of Thai students. In this study, the researcher was interested in a synthesis the theses of graduate research at a Thai government university and related to the strategies used to improve the English skills of students in Thailand by using meta-analysis. These graduate studies were published in an English version which Thai researcher have not studied before.

A meta-analysis is a synthesis of studies, including a summary of their results, in order to draw general conclusions. The researcher was interested in a synthesis of graduate studies using a meta-analysis, which may then be used to achieve a synthesis from which conclusions can be drawn. For this study, the researcher chose the method used by Glass, McGaw, and Smith (1981), the most published method with the clearest analytical formula. This research is a synthesis of quantitative research employing statistical methods. The results, which are broader and deeper than general research, may be used as a guideline for future theses on the subject of English teaching strategies. The findings will also highlight innovative teaching strategies to guide teachers in planning their teaching activities in order to improve the learning of effective English communication skills.

The objectives of the study were as follows:

1) To analyze the characteristics of the graduate research on teaching strategies used for improving the English skills of Thai students

2) To evaluate the quality of graduate research on the teaching strategies used to improve the English skills of Thai students

3) To compare the characteristics of graduate research to a standard index

2. Literature Review

This section is a review of the related literature, beginning with teaching strategies to improve students' English skills, followed by meta-analysis.

2.1 Teaching Strategies for Improving English skills

The teaching strategies for improving English skills in this study included methods or instruction aimed at enhancing the English communication skills of learners, focusing on curriculum content and the specified objectives to reach an established standard (Dijkstra, 2004; Issac, 2010).

Teaching strategies can be divided into many types depending on the criteria used. Khamanee (2013) divided teaching and learning innovations into two categories: 1) teaching and learning media:

printed media, such as ready-made lessons, learning sets, exercises, and audiovisual materials, such as movies and computer-assisted instruction; 2) teaching methods and techniques, such as experiential learning, cooperative learning, 4MAT, and the storyline method. Educational innovation can improve the quality of teaching and learning and encourage teachers to develop various innovations. Teachers must follow up and apply new teaching-learning management concepts to try and improve their own teaching. They need to be able to teach effectively in challenging environments by applying information technology adapted for various learning styles (Noom-ura, 2013).

2.2 Meta-Analysis

Initially, meta-analysis was used in the field of psychotherapy (Smith & Glass, 1977). A meta-analysis is basically a study about studies and is used to get an integrated result. In other words, a researcher reviews previously published studies on a topic, then analyzes the various results to find general trends across the studies. It can be used in education, medicine, and psychology (Shelby & Vaske, 2008). A meta-analysis is beneficial because it is a review designed to summarize information. It follows a few general principles; for example, it is performed systematically, follows certain criteria, contains a pool of findings, and is based on quantitative analysis. The review provides crucial conclusions and trends that influence future research and the decisions of policymakers.

In the field of education, meta-analysis has been applied to topics as diverse as the comparison of distance education with traditional classroom learning, and the relationship between teacher credentials and student achievement. The results of these and similar meta-analyses have influenced practice and policy around the world. The meta-analyses contributed to the best-published sources of integrated evidence (Willig, 1985; Greene, 1998). The differences in these defining features can be reflected in three points: methodology, analysis technique, the unit of analysis, and the use of effect sizes. A synthesis will be meaningful if studies have been examined systematically.

Therefore, meta-analysis can synthesize the characteristics of graduate studies that include general research details. The findings gained from the synthesis of a thesis using meta-analysis can be used to develop the skills of teachers and improve learners' skills.
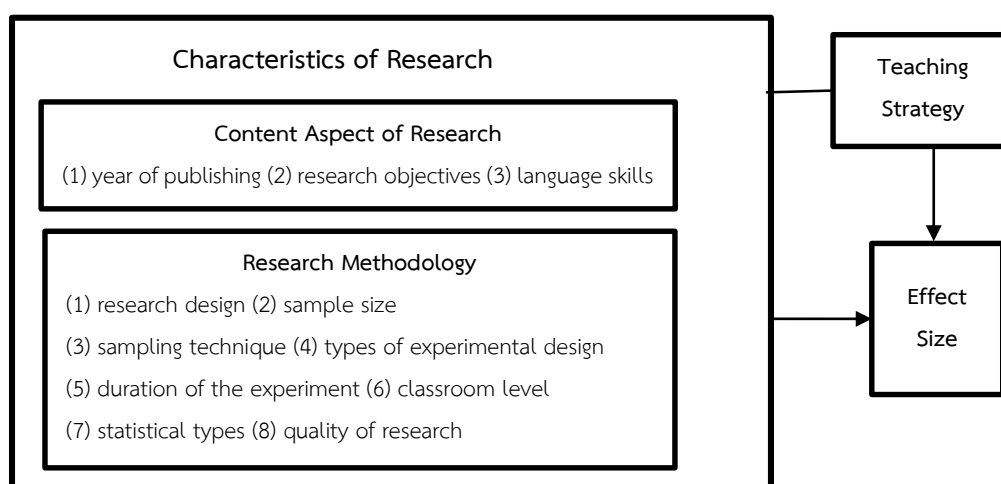
Characteristics of Research

Content Aspect of Research
(1) year of publishing (2) research objectives (3) language skills

Research Methodology
(1) research design (2) sample size
(3) sampling technique (4) types of experimental design
(5) duration of the experiment (6) classroom level
(7) statistical types (8) quality of research

Teaching Strategy

Effect Size

Figure 1 Conceptual Framework

3. Methodology

This research study employed quantitative data to answer the research questions.

Participants

The participants of this study comprised 22 graduate research studies selected by purposive selection at a Thai government university.

Inclusion criteria

This study focused on the theses of graduate students at a Thai government university and related to the strategies and techniques used to improve the English skills of students in Thailand. The experimental research was published from 2004-2020 in English versions and had a full text. A computer search was performed on theses or dissertation abstracts through the website of the university library in order to find all references to individual assessment in terms of employment selection using the following search terms: strategies for teaching English, innovations for teaching English, techniques for improving English, methods of improving English, English teaching, and English learners.

Instruments

The research instruments consisted of a record form and an evaluation form.

1) The record form was applied from Office of the Education Council Secretariat (2009) and Wiratchai (1999). It consisted of 14 statements of the general descriptive characteristics data of the research, such as the content aspect and the research methodology. Moreover, the record form has a manual code book that describes the details of the code.

2) The evaluation form was developed from the Education Council Secretariat (2009). It used a five-point rating scale from 0-4 (0 = the quality of the research is at a very low level, 1 = low level, 2 = medium level, 3 = high level, and 4 = very high level). There were 26 statements related to research characteristics, and a rubric was used to assess the descriptive characteristics of the research in each item.

Below are the criteria for the interpretation and evaluation of the quality of the research.

Criteria for evaluation interpretation

3.01 - 4.00 = the quality of the research is at a very good level

2.01 - 3.00 = the quality of the research is at a good level

1.01 - 2.00 = the quality of research is at a medium level

0.00 - 1.00 = the quality of the research is at a low level

Validity and Reliability of Research Instrument

1) Validity check: Three experts checked the content validity of the research instruments by using Item-Objective Congruence Index (IOC). The instruments were used when the results of the IOC index for each item was 0.67-1.00.

2) Reliability Check: Two lecturers who are expert in research and evaluation consider instruments for checking inter-rater reliability. This study used the formula below to check inter-rater reliability (Sathit-narakul, 2007).

$$P = Po/Po + PE$$

P is the parity of the observations

Po is the number of corresponding assessments

PE is the number of non-conforming assessments

The inter-rater reliability of the record form and the evaluation form were 0.93 and 0.73, respectively.

Data Collecting Procedures

The data collection was undertaken as follows: 1) reading the research to obtain the characteristics, such as content aspect and the research methodology; 2) reading the research carefully and conducting research quality assessments; 3) recording research characteristics by using a quantitative research feature recording form; the coding of each variable was determined by the coding manual; and 4) analyzing the data and testing the differences in effect size according to the variables of the research characteristics.

Data Analysis

The data were analyzed using percentages, frequencies, means, standard deviations, effect size, t-test, and one-way ANOVA. The effect size calculation by using Glass, McGaw, and Smith (1981), was based on the formula below:

$$\text{Effect size} = \frac{\text{Mean}_{\text{treatment}} - \text{Mean}_{\text{control}}}{\text{Standard deviation}}$$

$$\text{Effect size} = \frac{\text{Mean}_{\text{after treatment}} - \text{Mean}_{\text{before treatment}}}{\text{Standard deviation}}$$

4. Results

4.1 The characteristics of the graduate research

The results are presented according to the research objectives and research questions as follows:

4.1.1 The characteristics of the graduate research in terms of the content aspect

The data from the record form were analyzed using descriptive statistics. The content aspect of research is presented in five dimensions. The first one was the year of publishing, with the largest percentage being the year 2020 (22.72%), followed by the year 2016 (18.18%), while the years 2017 and 2015 had the same percentage (13.63%). Next, theses in M.A. graduate research comprised around two-thirds (72.72%), followed by M.A. independent studies (22.72%), and one Ph.D. thesis (4.55%), respectively. All 22 research studies had the objective of making comparisons (100.00%). A

focus on vocabulary in language skills had the highest percentage (31. 81%), followed by grammar (18.18%), and listening and writing had an equal percentage (13.63%). For teaching strategies, materials made up around three- fourths (72. 72%) , and methods were the focus of six studies (22.27%). This shows that the research of last year's graduate students focused on teaching strategies, especially M.A. theses. Most of them focused on vocabulary.

4. 1. 2 The characteristics of the graduate research in terms of the research methodology

The analysis of the characteristics of research methodology found that one-group pretest-posttest design had the highest frequency at 54.54%. Non-randomized control group pretest-posttest design was the second highest. The highest sample size was 60-69 people, which was 27.27%, followed by a sample size of 50-59 people and a sample size of less than 30 people at 22.72%. The sample size of 40-49 people made up 18.18%. The lowest sample size of 30-39 made up 9.08%. However, for the aspect of sampling technique, the most common sampling technique was purposive sampling at 77.27%, followed by convenience sampling at 13.63%. The other groups that had the same percentages were simple random sampling and no sampling technique identified at 4.54%. Regarding the duration of the experiment, most of the research spent time < 11 hours, which was 13 studies (59.09%), followed by 11-20 hours in four studies (18.18%). Regarding the classroom level of the samples, there were three levels of students' education. Secondary school was the highest at 63.63%. Primary school and tertiary had the lowest levels at 18.18%. The last characteristic was the type of statistics. A dependent t-test was the primary type at 50.00%.

4.2 The results on evaluating the quality of graduate research

Table 1 Number of research studies at each level of quality

Level of quality	Number of research	%
Very high	4	18.18
High	18	81.81

The research studies were evaluated using an assessment form. There were four research studies that had a total score at a very high level and 18 research studies had a total score at a high level. The final step was a comparison of the characteristics of the graduate research in regard to effect size.

The findings on evaluating the quality of graduate research on the teaching strategies used to improve the English skills of Thai students were derived from the 26 items in the scoring rubric and assigned a score on a five- point rating scale from 0 to 4. The data from the assessment form were analyzed using mean scores and standard deviations. The value of the evaluation interpretation was determined using four levels: low, medium, good, and very good. The average score shows that the value of evaluation interpretation was at a good level (M = 2.98, SD = 0.33). There were 17 items that had a very good level (M = 3.10 - 4.00). There were seven items that had a good level (M = 2.95-

3.10). There were two items that had a medium level (*M* = 1.24 - 1.52). Meanwhile, the conceptual framework of the research was correct, appropriate and clear, based on the low mean of the research principles (*M*= 0.14, *SD* = 0.66), while the value of evaluation interpretation was at a low level. Finally, sufficient documents and relevant research had the highest mean (*M*= 4.00, *SD* = 0.00).

4.3 The results of comparing the characteristics of graduate research to effect size

This part is divided into two sections. The first one presents the results of comparing the graduate research characteristics in terms of effect size. It is crucial to check the normality distribution to identify the fundamental assumptions related to the implications of the multivariate techniques (Hair et al., 2010). Based on this recommendation, the absolute values of the skewness and kurtosis must be within an acceptable range; data is considered normal when the range of skewness is ☐ 2 to +2 (Hair et al., 2010) and the range of *kurtosis* is ☐7 to +7 (Byrne, 2010; Hair et al., 2014).

Table 2 Background data of overall average effect size from the graduate research

Variables	n	*M*	*SD*	Range	Min	Max	Sk	Kur
overall average effect size	22	1.42	.21	3.89	.14	4.03	.93	1.03

Table 2 shows that the overall effect size of the graduate research had a mean = 1.42, *SD* = .21, Range = 3.89, Min = .14, Max = 4.03, Skewness = .93, Kur= 1.03. The overall effect size had a mean of 1.42, equal to the value of 92%, which indicates that the average student in the experimental post-test group would score higher than 92% of the control group/pre-test group that was initially equivalent. This indicates that the treatment variables and/or the independent variables from the overall synthesized study had a high effect size on average.

The next section presents the independent samples *t*-tests comparing the means of the two groups of independent variables in order to determine whether there was statistical evidence that the effect size means between teaching strategies (materials and methods) were significantly different. This was done in two steps: the first one was an equivalence test of variances. It illustrates that the Levene's test indicates no variance between the method and materials, F-test = .305, p = .587, and the second was an independent samples t-test, as shown in Table 3.

Table 3 Means and standard deviations of the teaching strategies in terms of effect size

	Teaching strategies	N	Mean	*SD*	t	Sig
Effect Size	methods	6	1.05	.74	1.314,	.204
	materials	16	1.62	.96		

Table 3 shows that there were six methods and 16 materials. The mean effect size for methods was 1.05 (*SD* = .74), and the mean effect size for materials was 1.62 (*SD* = .96). The results were not significant at the .05 level. This means that the groups of the teaching strategies did not affect the effect size of student achievement.

In addition, the research results show that there was a statistically significant difference in the mean scores of the independent variables, as shown in Table 4.

Table 4 One-way ANOVA determining the effect of sample size on effect size

Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.229	4	2.057	3.132	.042
Within Groups	11.167	17	.657		
Total	19.396	21			

P<.05

According to Table 4, in order to determine whether there was a difference among the means of the sample size groups, one-way ANOVA was employed. The results indicate that there was a statistically significant difference ($F(4) = 3.132$, $p < .05$). Therefore, post-hoc tests using the Scheffe method were performed for the sample size groups to determine if they differed from each other; post-hoc analysis revealed that there were five sub-groups of sample sizes, but there was a statistically significant difference in only one group between the subgroups with sample sizes of less than 30 people and 30-39 people (p<.05).

5. Discussion and Conclusion
5.1 Discussion
Teaching strategies

In the sample in this research, the teaching strategies mainly focused on materials (72.72%), which were media and materials, such as pictures, flashcards, books, hardware/software, diagrams and computer games. Meanwhile, methods made up 22.27%, which were demonstrations, group discussions and presentations. This may be because the researchers were interested in producing materials for use in teaching vocabulary. Research conducted by Khaneeyor (2017) showed that in the context of vocabulary learning, one of the effective teaching strategies for helping learners to acquire vocabulary is the use of authentic listening materials.

The results on the evaluation of the quality of the graduate research

The results of the evaluation of the quality of the 22 graduate research studies show that 18 had a total score at a high level. The item "the conceptual framework of the research is correct, appropriate and clear, according to the research principles" had the lowest mean (*M*= 0.14, *SD* =0.66) and had a value of evaluation interpretation at a low level. In contrast, the statements "the documents and related research are up to date" and "the hypotheses are correct and clear according

to the research objectives" had a value of evaluation interpretation at a medium level, according the research results by Pipatsathidkul (2013). Therefore, research should focus on the development of these three areas in order to improve the quality. In addition, research studies should be conducted to promote skills other than vocabulary to improve English communication among Thai students.

The results on comparing the effect of the characteristics of the graduate research on effect size

The standard index of graduate research on teaching strategies used for improving the English skills of Thai students used to compare the mean effect size between the materials and methods was not statistically significantly different at the level of .05, which indicates that different English teaching strategies result in the same achievement in learning. This may be because the teaching materials that teachers use to teach are appropriate for the age and class levels. This finding is similar to the research of Khankhaeng (2021) on the issue of innovative learning process management for improving learning achievement in English subjects of junior high school students and senior high school students. The study found no statistically significant difference at the .05 level, while the different types of innovations influenced the size of the learning process arrangement that affected subject learning achievement. The English language achievement among secondary school students differed statistically at the .05 level.

The sampling technique was found to affect effect size at the statistically significant level of .05. This means that the difference in these variables affects the difference in learning achievement. This is consistent with Pipatstitkul (2013), who found that the higher the effect size value, the greater the difference in learning achievement. Meta-analysis also revealed that the sample size's effect on effect size was statistically significant at the level of .05. The highest mean effect size was 30-39 students, with an average effect size of 3.23, followed by 60-69 students, with an average effect size of 1.58. Hence, this suggests that teaching in a classroom of 30-39 students will lead to better academic achievement than other room sizes.

5.2 Conclusion

5.2.1 Summary of the evaluation of the quality of graduate research on the teaching strategies used to improve the English skills of Thai students

The result of the evaluation of the quality of the graduate research on the teaching strategies used to improve the English skills of Thai students are presented in two dimensions, which were derived from 26 items of the rubric adjusted to a five-point rating scales from 0 to 4. The first dimension was the total score of the evaluation of the quality of graduate research. There were four research studies that had a total score at a very high level and 18 research studies that had a total score at a high level. Thus, all of the research could be implemented in the final step to compare the effect of the characteristics of the graduate research on effect size. In addition, the results on the total score and the evaluation of the quality of the graduate research showed that there were four research studies

that had a total score at a very high level and 18 research studies that had a total score at a high level. The last one was the results of evaluating the quality of graduate research from 26 items. There were 17 items that had a value of evaluation interpretation at a very good level. There were seven items that had a value of evaluation at a good level. There were two items that had a value of evaluation interpretation at a medium level. The item "sufficient documents and relevant research" had the highest mean, whilst the item "the conceptual framework of the research is correct, appropriate and clear, according to the research principles" had the lowest mean and had a value of evaluation at a low level.

5.2.2 Summary of the comparison of the graduate research characteristics to the standard index

The overall effect size of graduate research had a mean = 1.42, *SD* = .21., Range = 3.89, Min = .14, Max = 4.03, Skewness = .93, Kur= 1.03. The overall effect size had a mean = 1.42, equal to the value of 92%, indicating that the average student in the experimental post-test group would score higher than 92% of the control group/pre-test group that was initially equivalent. This indicates that the treatment variables and/or the independent variables from the overall synthesized study had a high average effect size.

Regarding the effect size of the graduate research on teaching strategies used for improving English skills, there were 37 effect sizes from the 22 research studies. For the comparison of the effect size of the characteristics of the graduate research, the researcher focused on the 22 effect sizes of student achievement.

The research results show that there was a statistically significant difference in the mean scores of the two independent variables (sample size and sampling technique) compared to the dependent variables (effect size). The sample size had five subgroups. The sampling technique had four subgroups. One-way ANOVA was employed for comparing the effect of the independent variables with the dependent variables. The research results show that the sample size had a significant effect on effect size at the level of .05, whereas the sampling technique affected effect size at the statistically significant level of .01. These variables affected the effect size, that is, the difference in these variables affected the difference in learning achievement. The higher the effect size value, the greater the difference in learning achievement. From the meta-analysis, it was found that the sample size variable with the highest mean effect size was 30-39 people, with an average effect size of 3.23, followed by 60-69 people, with an average effect size of 1.58. Therefore, teaching in a classroom of 30-39 students will lead to better academic achievement than other room sizes. Furthermore, for sampling technique, convenience sampling had the highest mean effect size at 3.02, followed by simple random sampling at 1.39 and purposive sampling at 1.33, while no sampling technique identified had the lowest of mean effect size at .88.

5.3 Pedagogical Implications

These sample/ materials employed non- probability sampling techniques, i. e. , purposive sampling and convenience sampling. The findings from this research sample thus cannot be generalized to the population. Therefore, if researchers or teachers are interested in using the research results, such as the techniques for teaching English from the sample of this research, they should consider adapting them to their own context, such as the skills being taught, the class level, and the basic knowledge of learners. The research results showed that the sample size of 30- 39 people had the highest mean effect size. Therefore, this suggests that teaching in a classroom with a student size of 30- 39 students will lead to better academic achievement than other room sizes.

5.4 Recommendations for further studies

The result of evaluating the quality of the graduate research on the teaching strategies used to improve the English skills of Thai students shows that there was one item that had the lowest means value and had a value of evaluation interpretation at a low level, that is the conceptual framework of the research is correct, appropriate and clear, according to the research principles. There were two items that had a value of evaluation interpretation at the medium level, that is, the hypotheses are correct and clear according to the research objectives and the documents and related research are up to date.

Therefore, to improve the quality of the research, researchers should present a more comprehensible conceptual framework for readers to facilitate understanding. Moreover, future studies should employ a meta-analysis of language teaching in other areas, such as translation, innovation, and expanding study resources in universities. Finally, further studies should also use multiple regression statistics to reveal the factors affecting teaching-learning from independent variables.

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