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Strategy-Based Teaching in ELT: A Meta-Analysis

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Abstract

This meta-analysis study aimed to explore the effectiveness of Strategy-Based Teaching (SBT) in ELT (English Language Teaching). A total of 18 original studies (2000–2020), with 1834 participants of diverse learning and teaching contexts, conformed with the inclusion/ exclusion criteria, were employed to be analyzed in this study. To provide a comprehensive picture of the possible moderating factors, we included 21 moderators under three moderating sets. The impact of methodological criteria, such as eligibility revisions and substitution of alternative ranges of values for arbitrary or unclear decisions, was examined using sensitivity analyses. The findings revealed an overall significant, positive and medium effect of SBT on English learners' outcomes for both fixed (g = 0.65) and random (g = 62) models. Moreover, meta-regression analysis results of moderating factors showed that the place, type, and design of the study had no significant predicting effect on SBT. It has been documented that the results of moderator analysis of language skills and components were also not significant. However, the results for moderating effect of language measurement instruments were found to be significant. Studies that employed standardized tests for language learning measurement revealed significantly higher mean effect size in comparison with those that used teachers' assessments. Overall, SBT was found to be positively effective within a variety of teaching and learning contexts in ELT.

Keywords: strategy-based teaching (SBT), meta-analysis, teaching strategies

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1. Introduction

Based on our primary literature review, providing a clear-cut definition for "teaching strategies" is not an easy task. It has been reported in the literature to be used synonymously with other similar terms like method, styles, techniques and approaches. Researchers believe that the unclarity of definitions and multidimensionality of language practices in real-life situations have led to the birth of many forms of SBT. Sometimes, the focus of attention was on learning strategies and some other times on teaching strategies. The term "strategy-based instruction" was defined by Cohen and Weaver (2005) as: "students are explicitly taught how, when, and why certain strategies (whether alone, in sequence, or in clusters) can be used to facilitate language learning. Teachers describe, model, and give examples of strategies" (p.7). There are also differences between teaching strategies, strategy teaching and strategic teaching in ELT literature. According to Greenberg and Davila (2018), teaching strategies refer to the ways and tactics employed in delivering the teaching-learning exchange while the second one, strategic teaching, relates to the decision-making process concerning an English teaching course, person, or even an entire educational program which includes elements of time, space, staff, and community. The third common term in this realm is "strategy teaching", which seems to be teaching to students' strategies of learning management and arrangements. Strategies have also been used with regard to language learning and language use, as reported by Cohen (2014). What we are dealing with in the present study is teaching strategies, in other words, the "how" of teaching and its influence on learning outcomes. This is what stated by Cohen and Weaver (2005) as follows:

> The underlying premise of the styles- and strategies-based approach is that students should be given the opportunity to understand not only what they can learn in the language classroom, but also how they can learn the language they are studying. (Cohen & Weaver, 2005, p. 5)

Since the introduction of SBT in the early 21st century, it was used in many language teaching contexts throughout the world, as reported by Plonsky (2011), Psaltou-Joycey (2020), Zhang et al. (2020), Takeuchi (2019), Cohen and Wang (2018), Ghahari and Ebrahimi (2017) and many other studies. However, based on our literature search, no recent comprehensive meta-analysis study, including

recently published papers on SBT, has been done to reflect the full picture of SBT's effectiveness in diverse contexts. Therefore, the present meta-analysis study seeks to evaluate the overall effectiveness of SBT and the possible moderating factors from 2000 to 2020.

The following research questions guided the present meta-analysis:

Research Question 1: What is the overall effectiveness of strategy-based teaching?

Research Question 2: Is the effectiveness of strategy-based teaching moderated by features of intervention programs?

2. Literature Review

In the post-method era, the no best method time, talking of strategies is more relevant and fashionable in ELT. Kumaravadivelu (2006) criticized the descriptive expert-directed top-down nature of methods in favor of bottom-up, teacher-directed and decolonizing movement in ELT. He suggested a macrostrategic framework that relies on no specific theory of language and of learning. He proposed 10 macrostrategies which include maximizing learning opportunities, facilitating negotiated interaction, minimizing perceptual mismatches, activating intuitive heuristics, fostering language awareness, contextualizing linguistic input, integrating language skills, promoting learner autonomy, ensuring social relevance, and raising cultural consciousness (see Kumaravadivelu, 2006 for a detailed discussion). These strategies were considered general guidelines for the teachers who did not intend to prescribe what and how to teach. Allwright's (1997) exploratory practice was also another attempt to move from theory-to-practice toward practice-to-theory for teachers by teachers. From his point of view, language research has to "understand life, not trying to directly solve problems, but to step back from them and see them in the larger context of the life (and lives) they affect" (Allwright, 2003, p. 28).

Since 1960s, the focus on leaner and learning has brought about the tremendous departure from behavioristic psychology toward more cognitive theories, in which the concepts of the "how to learn and how to teach" or the quest for best learning as well as the pursuit for best teaching practices and theories has turned into a long-

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lasting marathon for all shareholders in ELT. Methods, approaches, styles, techniques, strategies and many other terms with their manipulations have emerged, enlarged, faded away or even died down in the history of language teaching and learning. However, at the outset of the twenty-first century, with the emergence of new technologies in teaching and learning, we believe that the package of language teaching strategies has gone through some metamorphic changes both in theory and practice.

It seems that SBT has flourished in 21st century with the emergence of new technologies in the area of computer-enhanced learning and teaching as well as learners' freedom, choice and diversity, which has led to the appearance of a whole new realm of teaching and learning strategies for teachers, learners, policymakers and even curriculum developers and textbook writers. SBT started thriving in every direction and; consequently, lots of studies have been conducted on both language learning in general and on language skills and components in particular. A number of publications, some commercially-oriented, have been released for teachers, educators, researchers as well as policymakers in the ELT sector. "120 Content Strategies for English Language Learners: Teaching for Academic Success in Secondary School" by Reiss (2011), "50 Strategies for Teaching English Language Learners" by Herrell and Jordan (2003), "Penny Ur's 100 Teaching Tips" by Penny and Thornbury (2016), and "Language Learning Strategies: What Every Teacher Should Know" by Oxford (1990) are some of the studies which have focused on strategies of teaching in ELT. However, the missing part of this knowledge dissemination is the question of the effectiveness of SBT. To answer this question, Plonsky (2011) conducted a meta-analysis on the effectiveness of SBT. In his study, he included some moderating factors such as teaching context, participants' age, proficiency level, treatment types and outcomes. However, his findings indicated mixed results concerning different moderating factors and a rather small effect size (d=49). Since his study was conducted 10 years ago, a meta-analysis of SBT with the inclusion of studies published since 2010 can provide us with further insights into the effectiveness of SBT as the findings of these studies are still controversial.

For instance, Ngo (2019) and Akkakoson (2013) reported mixed findings concerning the effects of strategy training on language learning performance. Akkakoson (2013) maintained that more proficient language learners demonstrated more effective integration of reading strategies in their reading repertoire in comparison with their lower-level peers. However, Ngo (2019) reiterated the

importance of context-dependency of strategy instruction, and not learners' proficiency, due to the cultural and socioeconomic background of learners. He concluded that it is crucial to provide "students with opportunities to explore, select, and evaluate their strategy use rather than transmitting strategy knowledge. This can be done through practice, revision, and self-study activities" (Ngo, 2019, p. 73).

This controversy can also be found with regard to SBT and language skills. While some studies (Bai, 2015; Hamada, 2016; Schwartz et al., 2017; Yagcioglu, 2018) reported the benefits of SBT for language skills, some other studies (Atai & Alipour, 2012; Johnson, 2017) reported mixed findings. On the other hand, examining the effect of strategy-focused instruction on vocabulary, Wei (2015) and Alamri and Rogers (2018) found that strategy-based vocabulary teaching could boost students' retention and learners' awareness through channeling direct attention.

Given these controversies in SBT studies, especially in those published after 2010, in this study, we performed a meta-analysis of SBT on language learning outcomes to provide teachers, students, policymakers, textbook developers and other stakeholders in ELT a more solid ground for strategy teaching and development, and at the same time, via a meta-regression of relevant moderator factors, a more robust understanding of the SBT trends in the last two decades.

2.1. The Rationale for Using a Meta-Analytical Approach in This Study

When we are dealing with too much information, the meta-analysis approach is a reasonable response to the challenge. According to Blokdyk (2020), meta-analytic approach is a powerful tool that could produce refined, well-structured and sufficient information on a subject matter with too much disparity and diversity. Driving polished information for decision making and implementation, in and out of the classroom, concerning strategy-based teaching is considered a valuable step towards more authentic and result-oriented language teaching and learning. A meta-analysis and meta-regression not only provide us with the overall effectiveness of SBT regarding English language learning achievement but also with major moderators affecting this overall effectiveness.

3. Methodology

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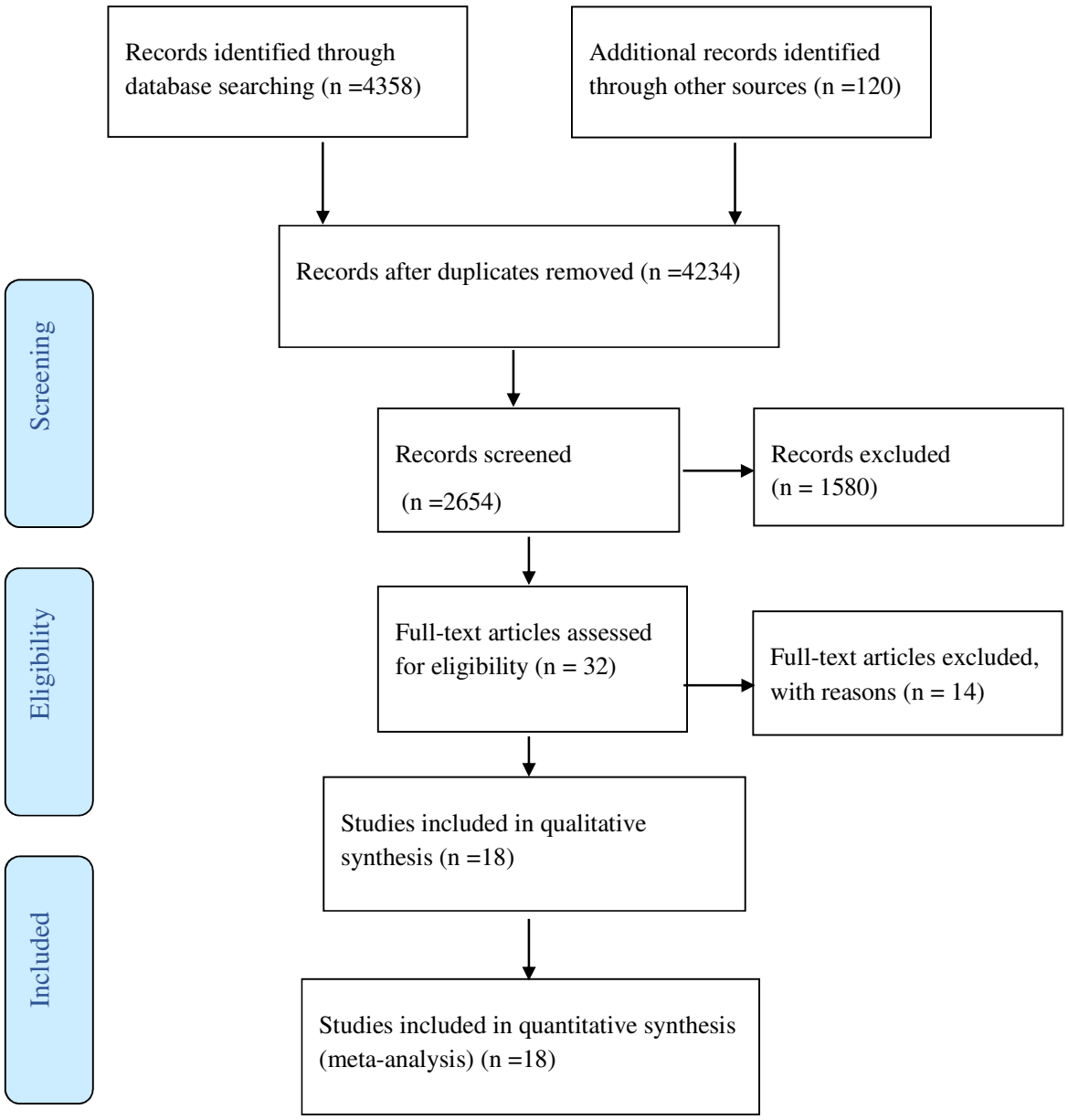
3.1. Study Identification and Retrieval

In the first screening stage, we started searching databases with keywords such as strategy teaching, strategy-based teaching, English teaching methods, vocabulary teaching and learning, language skills and strategies, listening, reading and writing in English, strategic teaching, grammar teaching and learning, lexical teaching and learning, teaching methods and teaching and learning styles. We used advanced search tools and other academic search technologies such as date intervals, the combination of terms, and subject and discipline categorization that electronic databases provided. The academic databases searched with our keywords were as follows: Cambridge Core, Google Scholar, JSTOR, ProQuest Dissertations & Theses Global, PsycARTICLES, PsycINFO, SAGEResearch Methods Online, Microsoft Academic Search, Academic Search Complete (EBSCO), Linguistics and Language Behaviour Abstracts (LLBA) (ProQuest), Project MUSE, Blackwell Reference Online, Scopus, Web of Science, Academic Search Premier, SpringerLink, Wiley Online Library, ResearchGate, iSEEK Education, RefSeek, Virtual LRC, Academic Index, Internet Public Library, Oxford Handbooks Online, Oxford Journals Digital Archive, ERIC - Education Resources Information Center, ScienceDirect, Sage Journals Online, SAGE Knowledge, and ProQuest.

In the next phase of the study, we identified major academic journals and publications in language, linguistics and education studies. In order to avoid the inclusion of predatory journals or publishers in our analysis, we used scientific journal metrics and rankings such as impact factors and other assessments of scholarly publications. Finally, we explored the reference sections of the relevant papers and continued chasing for more studies on the topic. The study selection process based on PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) model and according to (Moher et al., 2009) is depicted in Figure 1.

Figure 1

Study Retrieval Process



3.2. Inclusion and Exclusion Criteria

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A study was included in this meta-analysis if it met all the criteria listed below.

1. It was reported in a refereed, peer-reviewed journal, thesis, or dissertation in English between 2000-2020.

2. The independent variable was the treatment or intervention through strategy-based language teaching.

3. The design of the study was experimental or quasi-experimental.

4. The study reported essential quantitative and statistical data to perform the meta-analysis.

5. The dependent variable or variables were language achievement scores.

6. The participants were children, young or adult learners of English as a second or foreign language.

A (part of a) study was not included if at least one of the exclusion criteria was met:

1. The study did not report the required data to conduct the meta-analysis.
2. The medium of instruction was not reported to be English.
3. The study was conducted before 2000.
4. The study was not published in a refereed journal, a qualified thesis or dissertation.

3.3. Effect Size Calculation

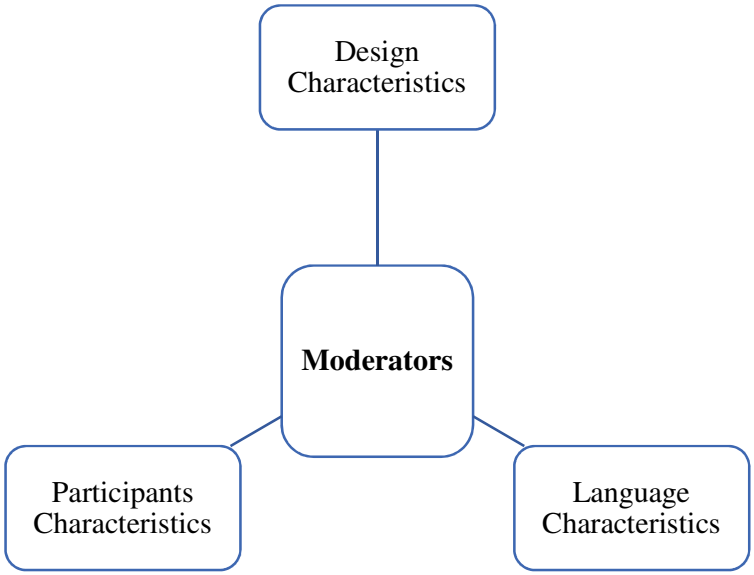
In the present study, for the calculation of the overall effect size, we used standard mean difference, which is a weighted estimate of the difference between treatment and comparison groups. We calculated the effect sizes as Hedge's *g*, which is the effect size measure that represents the standardized difference between means and is considered less biased than Cohen's *d*. The two statistics are similar regarding interpretation and application, except in the case where the sample sizes are below 20, Hedge's *g* is preferable, according to Ellis (2010). However, in accordance with Plonsky and Oswald (2014), based on Cohen's rules and the field-specific recommendation, an effect size of less than 0.40 is considered a small effect, between 0.40 and 0.1.00 is a medium effect, and larger than 1.00 is a large effect. The average score of a certain variable was calculated for studies which reported using multiple assessment tools for that variable, such as multiple choice and cloze

tests. For the calculation, Comprehensive Meta-Analysis software (CMA, version 3; ©2014, Biostat, Inc., Englewood, NJ) was used.

3.4. Coding of Moderator Variables

The second question of the study aimed to find and calculate the moderating factors of intervention effects of SBT on language learning achievement. Moderating variables may affect the overall effect size through covariation with key independent variables. In order to provide a comprehensive account of SBT on language learning, we included three major sets of moderators in our analysis. Figure 2 shows the moderator sets.

Figure 2
Moderators' Major Sets



The moderators' clusters included 21 different covariates. We conducted a separate meta-regression for each set of moderators and their subsets, including design characteristics, language characteristics, and participants' characteristics. For detailed information, the coding scheme is presented in Table 1.

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Table 1
Moderator' Coding Scheme

Variables	Value	Definition
Author(s) name	Name of the author(s)	The name of the reported author(s) is mentioned
Publication date	Publication year	Reported year of publication
Place of the study	Asia = 1 Non-Asian= 2	Reported place of the study
Study type	Journal article =1 Unpublished Ph.D.=2	The study was a journal article or an unpublished Ph.D. dissertation
Study ID code	001- 00…	A unique number assigned to each student
Native language	Asian = 1 European languages = 2 Mixed and other languages = 3	The reported native language of the majority of participants
Language major focus	Reading = 1 Writing = 2 Speaking = 3 Listening = 4 Vocabulary = 5	Self-explanatory
L2 Proficiency level	Beginner to low intermediate =1 Intermediate to advanced =2 Mixed =3	Reported variables representing the L2 proficiency levels of participants
Instructional level	School level = 1 University level = 2	The variables represented the instructional level of the participants
Study design	Experimental = 1 Quasi-experimental = 2	The reported design of the study
Sample size	The number of participants	The reported number of participants
Proficiency measurement	Standardized test = 1 Researcher's assessment=2	Proficiency measurement instruments

3.5 Reliability

Coding reliability was calculated through the assessment of inter-coder reliability. After the development of the coding book, the first and the fourth authors in this study separately rated the moderating factors of 50 percent of the studies. The primary inter-rater reliability of 89% was calculated based on each study's features. They met again in cases of incongruities and tried to make the inclusion criteria as transparent and explicit as possible, and consensus reached on final reliability of 93%.

3.6. Publication Bias

According to Borenstein et al. (2013), a meta-analysis is a set of statistical calculation which yields accurate results based on the synthesis of the included studies. In the cases where the included studies come from a biased sample, the bias shall be reflected in the final analysis. In order to address this issue, we employed a number of techniques to assess the likely effect of bias on our analysis. First, the use of funnel plots, as visual tools, offered us some sense of data spreading and helped us avoid overestimated or non-existing effects. It should be noted that the distribution of studies in the absence of publication bias is randomly distributed around the mean. In the presence of publication bias, smaller studies appear toward the bottom of the graph while the larger ones toward the top. Figure 3 illustrates the funnel plot of the present meta-analysis. Based on our subjective impression, it seems that the funnel is symmetrical, and this may be a sign of the absence of publication bias. However, since our subjective interpretation of the publication bias might be prone to human error, we applied Duval and Tweedie's Trim and Fill to quantify publication bias and provide our best estimate of the unbiased effect size.

Trim-and-Fill analysis is a technique developed by Duval and Tweedie (2000) to estimate potentially missing studies due to publication bias in the funnel plot and correcting the overall effect estimate. In theory, trimming yields a less biased estimate of the effect size by re-computing the imputed studies added to the analysis. The results of the Trim-and-Fill analysis of the present study (see Table 2) show that under the fixed-effect model, the point estimate, with 95% confidence interval for the combined studies, was 0.65766 (0.56328, 0.75024). Via Trim and Fill, the imputed point estimate was 0.65028 (0.57633, 0.76423). Under the random-effects model, the point estimate, with 95% confidence interval for the combined studies, was 0.62453 (0.43337, 0.81570). Using Trim and Fill, the imputed point estimate was 0.65884 (0.46271, 0.85497). In both models, as seen in Table 2., since the shift was trivial, we were more confident that publication bias was very minute and negligible.

Figure 3

Funnel Plot of Precision by Effect Sizes for the Observed and Imputed Studies

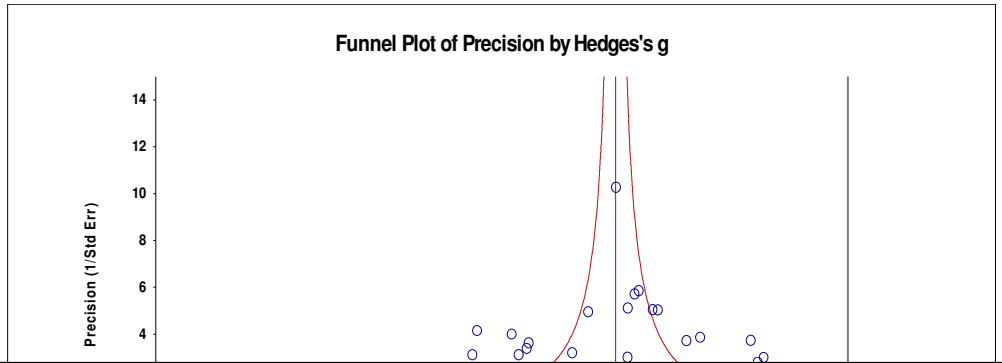

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Table 2
Duval and Tweedie's Trim and Fill Test of Publication Bias Estimation

	Studies Trimmed	Point Estimate	Fixed Effects (Lower, Upper)	Point estimate	Random Effects (Lower, Upper)	Q Value
Observed values		0.65766	(0.56328, 0.75204)	0.43337	(0.43337, 0.81570)	71.15906
Adjusted values	1	0.67028	(1.57633, 0.76423)	0.46271	(0.46271, 0.85497)	7876340

4. Results

4.1. Descriptive Statistics of the Included Sample

Based on the codebook of the analysis (Table 1), descriptive statistics included language skills or components, publication year, instructional levels, study design, effect size, sample size and all other related information. Each effect size was calculated as an independent study. Studies that generated more than one effect size were recorded separately in the tables with a. b. c. etc. labeling. The summary of all included studies is presented in Appendix A.

4.2. Overall Meta-Analysis Results

Our first research question aimed at finding the effectiveness of SBT. Table 3 indicates the results of the average weighted Hedges'*g*, the 95% prediction intervals,

the between-study variance, the Q-test for heterogeneity, the two-tailed test of null, and the percentage of variation between studies due to heterogeneity rather than sampling error. The effect sizes vary widely between –0.71 and 1.52. The findings revealed that, across all studies and regardless of moderating factors, SBT generated a moderate effect on student performance. The overall effect size for the SBT was found to be 0.66, with a standard error of 0.05, a z-value for a test of the null of 13.66, a corresponding p-value of less than 0.001 for the fixed model, and a mean of 0.62, a standard error of 0.10, a z-value for a test of the null of 6.40 and a corresponding p-value of less than 0.001 for the random model. According to Hedges and Olkin (2014), based on Cohen's rules, the mean effect size was found to be medium and significant for both models. We also conducted Q statistic of the heterogeneity (*Q = 70.16, df = 20, and p <.001*.) to calculate true effect size and sampling error. It showed that all the variance was unlikely to be due to the sampling error, and we also concluded that the true effect size was likely to vary from study to study. Therefore, the fixed-effect model was violated and did not match the data. For that reason, we used the random effects model (Borenstein et al., 2013).

Also, the between-study variance (τ^2) was calculated as 0.13. Some observed variance is because of real differences in effect sizes, while some are due to sampling errors. The I^2 statistic (71.89) signifies the amount of variation due to actual differences and could possibly be explainable by covariates. In this case (I^2 = 71.89%), the results indicated that a large amount of the observed variances reflected real differences in study effects. We also carried out the one-study-removed analysis in CMA for the sensitivity analysis. It was found that the average effect size was not affected by outliers. It was also found that the average effect size of language learning outcomes without the most prominent study was *g = 0.62, p <.001, 95% CI [0.43, 0.82] I^2 = 71.89%.*

Table 3

Results of the Univariate Random-E□ects Meta-analyses of SBT on Language Learning Achievement.

Dependent	N	K	g	SE	95%	Test of null	Heterogeneity	Tau-Squared

variable						CI	Z	P	Q	df	p	I^2	τ^2	se	τ
L2 learning outcomes	R	1834	21	.62	.10	[.43,.82]	6.40	.00	71.16	20.0	.00	71.89	.13	.07	.36
	F	1834	21	.66	.05	[.56,.75]	13.66	.00							

Note: N= total number of participants, R= random model, F= fixed model, k =number of effect sizes, g= mean weighted e□ect size in Hedges' g, SE = standard error, CI = confidence interval, Z = Z value, P = P value, Q = Cochran's heterogeneity test; df = degrees of freedom Q-test, τ^2 = between-study variance; I^2 = percentage of variation between studies that is due to heterogeneity rather than sampling error. V= variable

4.3. Moderator Analyses

For our second research question, in order to capture a comprehensive picture of the effects of SBT on language learning achievements, as depicted in Figure 2 and our coding scheme in Table 1, under three major moderator sets, including design characteristics, language characteristics, and participants' characteristics, we defined and analyzed 21 moderators. For each cluster of moderator variables, meta-regression was conducted independently. Q-statistic was also used to assess if a particular variable was a significant moderator. The results of moderator analysis are presented in Tables 4, 5, and 6.

4.3.1. Design Characteristics

Research design features could be a possible source of true effect or error. For the design moderating set, as seen in Table 4, three clusters, including the type of the study (Journal article and dissertation), place of the study (Asia and non-Asia), and design of the study (Experimental and Quasi-experimental) were meta-analyzed. For the first set, type of the study, the mean effect size for dissertations ($g = 0.78$) was found to be higher than that of the journal articles ($g = 0.56$). The results of the Q test, $Q^b = 0.91$, $df = 1$, $p^b = 0.34$, $\tau^2 = 0.1326$, $I^2 = 72.26$, $R^2 = 0.00$, with respect to the df given and p value of less than 0.05 and the corresponding confidence level of 95%, was found to be non-significant. In other words, the type of the study had no significant influence on the mean effect size of the intervention. The second cluster of moderating factors was the place of the study. The mean effect size for both regions, Asian and non-Asian's countries, was found to be medium (g = 0.65 and g = 0.57) respectively. The results of test of heterogeneity were also not

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significant (Q^b = *0.13, df = 1,* p^b = *0.72,* τ^2 = *0.1394,* I^2 =*73.00,* R^2 = *0.00*). The confidence interval for non-Asian countries was larger than that of Asian ones which could be due to the smaller sample size. The design of the study was the third set of our moderators. Both groups of studies, experimental (g = 0.74) and Quasi-experimental (g = 057), showed similar medium mean effect sizes; however, the mean effect size for experimental studies was found to be larger with a smaller confidence interval which could be due to random sampling in experimental studies. Finally, as a moderator set, the overall results of test of heterogeneity, Q^b = *2.13, df = 3,* p^b = *0.55,* τ^2 = *0.1586,* I^2 = *74.35,* R^2 = *0.00*, was also not significant.

Table 4

Moderator Analysis of Design Characteristics

Moderator	N	K	G	95%CI	Q^b	df	p^b	τ^2	I^2	R^2
Type of the study					0.91	1	.34	.1368	72.26	0.00
Journal article	1342	15	0.56	[0.31,0.81]						
PhD dissertation	492	6	0.78	[0.55,1.01]						
Place of the study					0.13	1	0.72	0.1394	73.00	0.00
Asia	1462	14	0.65	[0.43,0.87]						
Non-Asia	372	7	0.57	[0.15,0.99]						
Design of the study					0.69	1	0.41	0.1430	73.16	0.00
Experimental	484	7	0.74	[0.39,1.10]						
Quasi-experimental	1350	14	0.57	[0.33,0.80]						
Design characteristics set					2.13	3	0.55	0.1586	74.35	0.00

Note: N = total number of participants, k = number of effect sizes, g = mean weighted e□ect size in Hedges' g, CI = confidence interval, P = P-value, Q^b = Q-between, df = degrees of freedom, τ^2 = between-study variance; I^2 = percentage of variation between studies that is due to heterogeneity rather than sampling error. R^2 = the proportion of the original variance explained by the covariates.

4.3.2. Participants Characteristics

One of the sources of errors in sampling could be participants' characteristics. In order to find possible covariation of participants on the effects of SBT, we included four groups of moderators in our analysis. We also calculated the covariation effect of the combined set. For the first cluster, participants' native language, the mean effect sizes for all three groups, Asian language g = 0.74, European languages g = 0.70, and mixed and other languages g = 0.41 were found to be medium and positive. However, the size of the mean effect for mixed and other languages was relatively smaller than other groups. The result of heterogeneity test was also not

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significant ($Q^b = 2.24$, $df = 2$, $p^b = 0.33$, $\tau^2 = 0.1792$, $I^2 = 72.74$, $R^2 = 0.00$). For the second group of moderating factors, participants' L2 proficiency level, the results were found to be moderate for all three groups, including beginner to intermediate ($g = 0.64$), intermediate to advanced ($g = 0.30$), and for the mixed group ($g = 0.78$). Apparently, the mean effect size for the intermediate to advanced group was considerably, though not significantly, smaller than those of the two other groups. The result of the heterogeneity test, $Q^b = 2.54$, $df = 2$, $p^b = 0.28$, $\tau^2 = 0.1490$, $I^2 = 72.87$, $R^2 = 0.00$ was also not significant. The mean effect size for the next group of moderators, L2 proficiency measurement scales, which included researcher's assessment ($g = 0.35$) and standardized test g =77, was found to be positive and medium. However, the results of the heterogeneity test, $Q^b = 4.29$, $df = 1$, $p^b = 0.04$ $\tau^2 = 0.1238$, $I^2 = 69.09$, $R^2 = 0.06$ was significant. In other words, the effect of SBT was significantly smaller for those participants whose proficiency level was measured via researchers' assessment rather than standardized tests.

The R^2 test shows that 6% of the heterogeneity could be accounted for by the assessment's instruments. The results for the final group of the participants' characteristics, instructional level, were found to be medium both for school level $g = 0.59$ and university level $g = 0.65$. The results of the heterogeneity test, $Q^b = 0.1^2$, $df = 1$, $p^b = 0.73$, $\tau^2 = 0.1447$, $I^2 = 72.96$, $R^2 = 0.00$ was not significant. As a part of the heterogeneity analysis, we calculated the combined effects of all participants' characteristics as a linked set. The results of the Q test, $Q^b = 26.48$, $df = 6$, $p^b = 0.00$, $\tau^2 = 0.0567$, $I^2 = 50.38$, $R^2 = 0.57$ was found to be significant. The R^2 test shows that 57% of the heterogeneity could be accounted for by the moderating factor of participants' characteristics which involves almost 50 percent of the heterogeneity.

Table 5

Moderator Analysis for Participants' Characteristics

Moderator	N	K	g	95%CI	Q^b	df	p^b	τ^2	I^2	R^2
Native Language					2.24	2	0.33	0.1492	72.74	0.00
Asian languages	906	11	0.74	[0.47,1.01]						
European languages	188	3	0.70	[-0.01,1.39]						
Mixed & other languages	740	7	0.41	[0.08,0.74]						
L2 Proficiency level					2.54	2	0.28	0.1490	72.87	0.00
Beginner to intermediate	815	9	0.64	[0.37,0.90]						
Intermediate to advanced	233	5	0.30	[-0.33,0.92]						
Mixed	786	7	0.78	[0.46,1.10]						

Moderator	N	K	g	95%CI	Q^b	df	p^b	τ^2	I^2	R^2
L2 Proficiency Measurement					4.29	1	0.04	0.1238	69.09	0.06
Researcher's assessment	769	7	0.35	[0.04,0.67]						
Standardized test	1065	14	0.77	[0.54,1.00]						
Instructional level					0.12	1	0.73	0.1447	72.96	0.00
School Level	1062	10	0.59	[0.33,0.84]						
University Level	772	11	0.65	[0.35,0.96]						
Participants Characteristics Set					26.48	6	0.00	0.0567	50.38	0.57

Note: N = total number of participants, k = number of effect sizes, g = mean weighted e□ect size in Hedges' g, CI = confidence interval, P = P value, Q^b = Q-between, df = degrees of freedom, τ^2 = between-study variance; I^2 = percentage of variation between studies that is due to heterogeneity rather than sampling error. $R^{2\,=}$ the proportion of the amount of heterogeneity accounted for.

4.3.3. Language Characteristics

Language skills and components (Table 6) were our last set of moderators. The mean effect size for listening (g = 0.10) was found to be positive but very small. For other language skills and components including reading (g = 0.95), speaking (g= 0.59), vocabulary (g = 0.73), and writing (g = 58), the mean effect size was medium to large. Strategy based teaching was found to be most effective for reading and least effective for listening. We also found large confidence interval from -0.45 to 1.28. Finally, the results of the Q test, $Q^b = 7.34$, $df = 4$, $p^b = 0.1^2$, $\tau^2 = 0.1473$, $I^2 = 71.48$, R^2 = 0.00 was not significant. SBT was found to be positively effective for all language skills and components; however, the results showed a lot of heterogeneity and broad confidence interval among them.

Table 6

Moderator Analysis for Language Characteristics

Moderator	N	K	G	95%CI	Q^b	df	p^b	τ^2	I^2	R^2
					7.34	4	0.12	0.1473	71.48	0.00
Listening	244	4	0.10	[-0.45,0.65]						
Reading	455	5	0.95	[0.61,1.28]						
Speaking	221	5	0.59	[-0.01,1.18]						
Vocabulary	300	4	0.73	[0.36,1.10]						
Writing	614	3	0.58	[0.20,0.96]						

Note: N = total number of participants, k = number of effect sizes, g = mean weighted e□ect size in Hedges' g, CI = confidence interval, P = P value, Q^b = Q-between, df = degrees of freedom, τ^2 = between-study variance; I^2 = percentage of variation between studies that is due to heterogeneity rather than sampling error. R^2= the proportion of the amount of heterogeneity accounted for.

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5. Discussion

5.1. What is the Overall Effectiveness of Strategy-Based Teaching on L2 Achievement?

The first research question addressed in the present study was about the overall effects of SBT on language learning achievement. We found a positive and moderate mean effect size of 0.62. The results of this meta-analysis seem to have been in line with many other studies associated with SBT and inevitably learning. Some of these studies include Benati (2005), Bedir (2010), Plonsky (2011), Marzban and Isazadeh (2012), Sarafianou and Gavriilidou (2015), and Hamada (2016). Each one of these studies focused on the part of language teaching and learning, though what we did in this study was the investigation of their combined effects on language learning. Through this meta-analysis, it was aimed to shed new light on the rather old debates of superiority or inferiority of one strategy or one group of strategies over others. The findings of this systematic review of the past 20 years of investigation son SBT indicated that most language teaching strategies that were judicially employed in their respective contexts were actually effective. When we are dealing with multifarious states of affairs like language teaching and learning dynamic exchange, claiming certainty, superiority or inferiority is almost nonsense. What makes sense, in reality, is "it all depends". Especially, in post-method era, the time of diversity, as contended by Akbari (2008), Prabhu (1990), and Bell (2003) as well as the real experiences of many teachers and learners, "it all depends".

For the first reach question, the attention was rather on the unity of effectiveness, the overall effect size. To address the diversity and multidimensional nature of language teaching and learning with respect to strategies, in our second research question, we performed a meta-regression analysis to capture all major moderating factors in the second part of our study.

5.2. Are the Effects of Strategy-Based Teaching Moderated by the Features of Intervention Programs?

With the second research question, we included 21 moderators under three sets or moderating clusters in the analysis, including design characteristics, language characteristics, and participants' characteristics.

For the first set of moderators, design characteristics, we investigated the influence of the type of the study, place of the study and design of the study. Our findings indicated that none of these factors were a significant predictor of SBT. We found some variation among those factors but not to a significant level. For example, studies with experimental design showed a larger effect size in comparison with studies with quasi-experimental design. Inspired by Dinardo (2016), we postulate that a possible explanation for these results may be the lack of adequate random sampling of participants in a quasi-experimental design. Concerning the place of the study, we had two groups of original studies, those from Asia and those from non-Asian countries. The effectiveness of SBT was not significantly different with regard to the mentioned places. This means that these findings do not reflect what Hu (2002) argued. He asserted that communicative language teaching strategies failed to produce a substantial impact on Chinese English teaching reform due to Chinese culture of learning and philosophical learning and teaching underpinnings. The findings of this meta-analysis; however, indicated that SBT was effective irrespective of place of application. With regard to type of the study, dissertations and journal article, no significant results were found.

The next moderating set was participants' characteristics which included participants' native language, L2 proficiency level, instructional level, and participants'L2 proficiency measurement instruments. Ten different factors, as in Table 5, were meta-analyzed. For the first three groups, despite some variation from (g = 0.35 to g = 0.78), the moderating impact was found not to be significant. That is, SBT was significantly effective across all tested levels of instruction, proficiency and native languages. However, concerning participants' second language measurement, we analyzed studies that used standardized tests and the ones in which the measurement was carried out through researchers' assessments. The results demonstrated significant differences between the two groups concerning the effectiveness of strategy-based language teaching and language learning. Studies that employed standardized tests reported significantly higher mean effect size (g = 0.77) than those using teachers' assessments (g = 0.35). A possible explanation for these results may be the underestimation of learners' progress by their teachers. According to Sultana (2019) and Inbar-Lourie (2008), many language teachers lack the required competencies for language assessment. Therefore, the need for language assessment literacy is considered of prime importance not only for

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teaching and learning purposes, but also for research objectives and validity. For the mentioned reasons, the interpretation of this part of the findings needs to be approached with caution.

For the last moderator set, we meta-analyzed language characteristics which included four common language skills and vocabulary learning. The findings depicted a tremendous amount of variation among language skills from (g = 0.10) for listening to (*g* = 0.95) for reading. However, the test of heterogeneity showed no significant influence of SBT on language learning outcomes. The findings of the current study support the previous research with regard to the application of SBT on language skills and components, particularly vocabulary. For example, the findings corroborate the ideas of Schwartz, who suggested that second language readers can employ reading strategies even for the texts of other languages. They speculated that reading strategies might be transferred between two or more languages like English or French due to common Latin roots. The same could be argued for other strategies in listening and speaking skills. Concerning listening strategy instruction, the findings of the study by Cross (2009) indicated that strategy instruction significantly augmented comprehension of authentic listening resources. With his three-phase explicit listening strategy instruction of presentation, practice and review, the overall comprehension ability of language learners improved significantly. Due to the complex nature of listening skill, it was argued that deliberate instruction of strategies to cope with learning difficulties was found to be advantageous. Regarding reading comprehension, the findings of the current study are consistent with those of Brevik (2019), Ballou (2012), and Braten and Anmarkrud (2013). They all reported positive effects of strategy-based reading instruction. However, the results of a major meta-analysis study of strategy training in languages by Hassan et al. (2005) demonstrated mixed results of effectiveness. Finally, the findings observed in this study mirror those of the previous studies that have examined the effect of SBT on writing and speaking skills, including Cer (2019), Graham and Perin (2007), Suwartono and Nitiasih (2020) as well as Moradi and Talebi (2014).

Returning to the research questions posed at the beginning of this study, it is now possible to state that SBT was positively effective with respect to many diverse contexts. The findings depicted some variation with regard to some variables but the overall synthesis of the studies indicated that explicit teaching and using of strategies would produce beneficial results to both teachers and learners.

5.3 Recommendations for Further Research

Some of our sample sizes were too small to be compared meaningfully concerning some variables. Therefore, we were not able to compare the effectiveness of each language teaching strategy with those of others. A future study could replicate our review with more original studies and a larger sample size. This may provide the opportunity to see all major language teaching strategies side by side from every angle and aspect.

Another study could investigate the gender effect and language teaching strategies on a larger scale. In our study, the data was not large enough for investigation of gender effect and SBT.

New technologies like computer-enhanced language teaching and learning are booming in recent years. A new study may investigate the effectiveness of certain strategies in CALL (Computer Assisted Language Learning) environment via a living systematic review.

4.4 Implications of the Research Findings

Most educators agree that language teaching methods are the core of their concerns. The findings of the present study may have demystified some long old held beliefs about language teaching and learning. During the last century, the era of method birth and death, many methods flourished and some vanished. However, method-minded teachers, students, policymakers and other stakeholders are still out there and continue practicing, as mentioned by Bell (2003). Our findings reiterate the fact that no method is the best method. We found that each context is quite unique. Another important point we found in the study was the diversity and disparity of educational contexts, which require deploying a variety of strategies that best fit that individual context. Therefore, paying attention to individual differences both for educators and learners is considered of prime importance for 21st -century education.

Moving from the method era to the post-method era can be an appropriate response to the inadequacy of the method era in terms of teaching strategies. Teacher empowerment and freedom can play a key role in successful teaching of these strategies.

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4.5 Limitations

It is worth noting that we included some moderator factors in our analysis; however, none of them proved to be a salient and determinant feature on the effectiveness of SBT. For some of the moderators, such as each group of strategies, the number of studies was not enough to conduct meta-regression meaningfully. Lack of access to meta-analysis technical applications was also a major problem to us.

6. Conclusion

In post method era and 21st century education, the focus of attention shifted from unity to diversity, from teachers to learners and from limitations to more freedom and choice. According to Larsen-Freeman (2012), language teachers and learners, language teaching and learning as well as culture have moved from "unity to diversity.. to diversity within unity" (p.1). The results of our meta-analysis depicted this two-fold cohabitation, simultaneous coexistence of the opposites. We probed diverse situations of language teaching and learning with the synthesis of the results of 18 original studies on the effectiveness of SBT. In spite of much diversity, they were effective unitedly. The other point worth mentioning is the retrospective value of this systematic review which provides us with a broader understanding of SBT in numerous diversified contexts of language teaching and learning. The findings of the present study, with a glance at the past, a gaze at present and a glimpse at the future, reiterate the importance of individual differences in any context of language teaching and learning, contextuality of language education, more freedom for teachers and students, respect and appreciation of uncertainty in postmethod era, learner-focused teaching, personalized instruction, and embracing the coming changes and exchanges of 21 country education.

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Appendix A

The Summary Information for the Included Studies Based on Number of Effect Sizes

N	Study	EF	Type	Place	Design	Native	Prof	Scale	Level	Skill
1	Alamri and Rogers (2018)	1.44	Art	Asia	Exp	AL	Mixed	Stan	School	Reading
2	Bai (2015)	0.66	Art	Asia	Quasi	Mix	Mixed	Res	School	Writing
3	Chen (2004) a	0.90	PhD.	Asia	Quasi	AL	B To I	Stan	Uni	Writing
4	Chen (2004) b	0.73	PhD.	Asia	Quasi	AL	B To I	Stan	Uni	Listening
5	Chen (2004) c	0.87	PhD.	Asia	Quasi	AL	B To I	Stan	Uni	Reading
6	Cross (2009)	-0.71	Art	Asia	Quasi	AL	Inter	Stan	Uni	Listening
7	De Silva (2015)	0.06	Art	Asia	Exp	Mix	Mixed	Res	Uni	Writing
8	Eyckmans et al. (2016)	0.15	Art	NA	Quasi	EL	B To I	Res	School	Vocabulary
9	Guan (2014)	0.16	PhD.	Asia	Quasi	Mix	B To I	Res	School	Listening
10	Karimi (2015)	1.48	Art	Asia	Exp	AL	B To I	Stan	Uni	Reading
11	Lam (2009)	0.41	Art	Asia	Exp	AL	Mixed	Res	School	Speaking
12	Manoli et al. (2016)	0.50	Art	NA	Exp	EL	Inter	Stan	School	Reading
13	Mieure (2016)	1.15	PhD.	NA	Quasi	Mix	Mixed	Stan	School	Vocabulary
14	Mizumoto and Takeuchi (2009)	0.79	Art	Asia	Quasi	AL	B To I	Stan	Uni	Vocabulary
15	Nakatani (2005)	1.07	Art	Asia	Quasi	AL	Mixed	Res	Uni	Speaking
16	Naughton (2006)	1.52	Art	NA	Quasi	EL	Inter	Stan	Uni	Speaking
17	Nayak and Sylva (2013)	0.77	Art	Asia	Exp	AL	B To I	Stan	School	Reading
18	Tavakoli et al. (2016) a	-0.17	Art	NA	Quasi-	Mix	Inter	Stan	Uni	Speaking
19	Tavakoli et al. (2016) b	0.10	Art	NA	Quasi	Mix	Inter	Stan	Uni	Speaking
20	Townsend (2008)	0.73	PhD.	NA	Exp	Mix	Mixed	Stan	School	Vocabulary
21	Yeldham (2016)	-0.14	Art	Asia	Quasi	AL	B To I	Stan	School	Listening

Note: Art = Article, Quasi = Quasi-experimental, NA= Non-Asian, Mix = Mixed & other languages, AL= Asian Languages= EL= European Languages, B to I = Beginner to low intermediate, Inter= Intermediate to advanced, Stan = Standardized test, Res= Researcher's assessment, Uni=University, PhD. = PhD. Dissertation, Exp = Experimental, Prof= Proficiency, EF= effect size