



A Systematic Review of Instagram as a Mobile Assisted Language Learning Tool in English as a Second/Foreign Language

Farshid Tayari Ashtiani 

Department of TEFL, Payame Noor University, Tehran, Iran
ashtiani@student.pnu.ac.ir

Manouchehr Jafarigohar  (Corresponding Author)

Department of TEFL, Payame Noor University, Tehran, Iran
jafari@pnu.ac.ir

Hoda Divsar 

Department of TEFL, Payame Noor University, Tehran, Iran
h.divsar@pnu.ac.ir

Maryam Farnia 

Department of TEFL, Payame Noor University, Tehran, Iran
mfarnia@pnu.ac.ir

ARTICLE INFO:

Received date:
2023.12.20

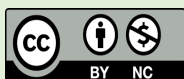
Accepted date:
2024.03.25

Print ISSN: 2251-7995
Online ISSN: 2676-6876

Keywords:

systematic review, Instagram,

MALL, meta-analysis



Abstract

In recent years, Instagram has gained considerable attention in scientific research because of its popularity among English language learners. This study aimed to conduct a systematic review of empirical studies that investigated the use of Instagram as a mobile-assisted language learning (MALL) tool in ESL/EFL and attempted to perform a scientific mapping of the literature. To this end, a corpus of studies since 2010 was retrieved in January 2023 from six academic databases and reviewed through the stages of Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA). A critical appraisal of 48 experimental studies included in this review was carried out and a meta-analysis of 11 eligible studies was conducted. The results of the meta-analysis confirmed the significant effect size of the use of Instagram in ESL/EFL. The bibliometric analysis revealed that the research productivity is up and found writing and vocabulary skills as the main focus in most of the studies. This study could have implications for teachers and researchers to gain a broad overview of the integration of Instagram in English language teaching and to know the current research trends in the field for future research.

DOI: 10.22034/ELT.2024.59650.2593

Citation: Tayari Ashtiani, F; Jafarigohar, M; Divsar, H; Farnia, M. (2024). A Systematic Review of Instagram as a Mobile Assisted Language Learning Tool in English as a Second/Foreign Language. *Journal of English Language Teaching and Learning*, 16(33), 316-340. DOI: 10.22034/ELT.2024.59650.2593

Introduction

Among the social networking sites, Instagram, as a mobile application and social media platform released in 2010, became one of the social media sites of high popularity, especially among the youth population, for its fascinating socializing features, such as posting photos and videos, leaving comments, starting live stories, using filters on pictures and videos, as well as attracting followers and following others. Accordingly, it very soon turned into a mobile-assisted language learning (MALL) tool in ESL/EFL. In 2013, McCarroll and Curran, referring to many other previous scholars, approved that social media applications provide stress-free and enjoyable environments for learning to convert the students' enthusiasm for social media into a language learning opportunity. Yu (2022) stated that with the outbreak of COVID-19 and the beginning of the pandemic, positive online learning outcomes were experienced, the acceptance of online learning approaches, methods, and tools increased, and positive perceptions, motivation, and attitudes grew among educators and learners. Similarly, as confirmed by Teng et al. (2022) and many other studies in the literature, Instagram has absorbed great attention during the past years and many studies (Ahmadi & Tabatanehi, 2021; Al Fadda, 2020; Aloraini, 2018; Auly et al. 2021; Dewi et al. 2022; Ghooriyan & Salehi, 2021; Handayani et al. 2018; Listiani, 2016; Yadegarfar & Simin, 2016 etc.) have been done to prove its effectiveness and explored the affordances of Instagram in teaching and learning of English language. However, Manca (2020) investigated the scientific literature on four top social media platforms, including, Pinterest, Instagram, WhatsApp, and Snapchat as learning environments in higher education. The author reviewed 46 studies and analyzed their pedagogical affordances. The results showed that unlike WhatsApp, which is well-researched in the scholarly literature, there is insufficient research and examination of integrating Instagram in ESL/EFL contexts.

Although many studies in the literature have investigated and confirmed the learners' positive perceptions, motivation and attitudes toward the use of Instagram in English language teaching and learning (Akhiar et al., 2017; Al Fadda, 2020; Alghamdi, 2022; Aloraini & Cardoso, 2020; Gonulal, 2019; Javed et al., 2018; Misnawati et al., 2022; Pujiati et al., 2019; Sari & Wahyudin, 2019; Tambunan et al., 2022; Ysusf & Jazilah, 2020) as well as the effectiveness of using Instagram on language learners' skills and learning process (Ahmadi & Tabatabaei, 2021; Aloraini, 2018; Auly et al., 2021; Dewi et al., 2022; Erarslan, 2019; Ghooriyan & Salehi, 2022; Handayani et. al., 2018; Kaviani, 2022; Khalitova & Gimaletdinova, 2016; Purwandari, 2017; Ramadoni, 2019; Rosdiani et. al., 2022; Soviyah & Etikaningsih, 2018; Yadegarfar, 2016), there are only few systematic reviews (John & Yunus, 2021; Rasyiid et al., 2021; Rizal & Farikhah, 2021; and Rohman et al., 2022) in the literature. Furthermore, these reviews were conducted on a very limited corpus of studies, which were neither exhaustive in searching nor comprehensive in reporting. Moreover, no meta-analysis has been done on a body of research that investigated the use of Instagram in ESL/EFL, and no study has reported the bibliographic data for mapping and performance analysis of the literature.

The main goal of this systematic review was to conduct a meta-analysis on included and eligible studies to detect the significant effects of Instagram on ESL/EFL learners because the individual studies in the literature may be too small in scale such as Auly et al. (2021); Lestari and German (2021); Rosdiani et al. (2022); Sallamah and Sabiq (2020); Sulistyorini and Rahmawati (2019). Thus, it was assumed that a combination of studies' results might increase the power and precision of the estimation of the effectiveness. Moreover, a bibliometric analysis was performed to map the scientific literature. This systematic review attempted to analyze the size, geographic distribution, and growth trajectory of experimental research about the use and effects of Instagram in ESL/EFL and on learners, and identified high-impact scholars on the topic. The researchers touched on a critical appraisal of the methodological quality by evaluating the instruments utilized, the teaching strategies and methods employed, the research designs adopted, the research foci chosen in the body of the empirical research, and collecting their bibliographic data.

The researchers posed the following research questions:

RQ 1: What is the treatment effect size of the use of Instagram as a mobile-assisted language learning tool in ESL/EFL in the scientific literature?

RQ 2: What are the size, growth trajectory, and geographical distribution of the research studies investigating the use of Instagram as a mobile-assisted language learning tool in ESL/EFL?

Literature Review

The usability and effectiveness of Instagram in the language learning process were examined by Erarslan (2019). He surveyed university students' opinions on the use of Instagram and the effects of this mobile application as a supplementary tool in English learning. He carried out quantitative and qualitative analyses and reported results that were mainly in favor of Instagram's impact on enhancing language learning. In a study conducted by Yeh and Mitric (2019), the integration of Instagram in English language teaching to assist learners in engaging in digital storytelling was experimented. The students confirmed that the use of Instagram increased their motivation, enhanced their writing and oral skills, and improved their English language proficiency. In addition, the learners expanded their interactions of peer-peer and student-teacher. Al Fadda (2020) examined the influence of English language learners' experiences, perceptions, and attitudes on the use of Instagram and Snapchat in a classroom. This study concluded that compared to Snapchat, Instagram was a social media platform with higher efficiency to engage learners and teach English language.

Ahmadi and Tabatabaei (2021) investigated to find out if Instagram could have any important effects on Iranian intermediate EFL learners' pictorial metaphors. Eighty English language learners participated and were divided into two experimental and control groups. The experimental group received the treatment via Instagram, and the results showed positively significant effects on pictorial metaphor learning. Furthermore, both groups had a positive attitude toward using the Instagram application. In a study carried out recently by Ghooriyan and Salehi (2022), the efficacy of Instagram as a MALL tool for teaching idioms was examined. The results of this study showed improvements in EFL learners' scores and idiom learning.

Also, the learners' attitudes toward the use of the Instagram application were surveyed and showed a positive outlook. The effectiveness of using Instagram for teaching vocabulary was also researched and approved by other researchers such as Rosdiani et al. (2022), Kaviani (2022), and Auly et al. (2021). In these research articles, it was found that Instagram provided technological and pedagogical advantages for both teachers and learners, and that learners' vocabulary also increased.

The application and effectiveness of Instagram for teaching writing were examined by some researchers such as Handayani et al. (2018), Saleh and Muhayyang (2021), Sallamah and Sabiq (2020), Soviyah and Etikaningsih (2018), Yusuf and Jazilah (2020), and affirmed learners' higher achievement of competencies in writing skills, greater engagement, and more positive perception. The effectiveness of using Instagram on learners' reading comprehension and speaking proficiency was examined by Dewi et al. (2022) and Wulandari (2019), respectively, and their results were confirmatory in favor of using Instagram. Sarangapani and Hashim (2022) investigated the usefulness of an Instagram feature, Reel, for teaching grammatical accuracy through an intervention named InstaGrammar. The treatment implemented resulted in the acquisition of grammar inside and outside the class.

In a systematic literature review conducted by Rohman et al. (2022), the authors focused on articles that investigated the effectiveness of Instagram only on vocabulary learning. They reviewed 17 articles and approved Instagram's efficacy. Rezaie and Chalak (2021) conducted a SWOT analysis to discover the strengths, weaknesses, opportunities, and threats of English teaching pages on Instagram in which 12 pages were analyzed and ten active users on those pages were identified and interviewed. They provided two SWOTs resulting from observation and interviews. They concluded that Instagram English teaching pages provide a large amount of input for learners, and the variety of the materials and diversity in the presentations can escalate learners' motivation.

On the other hand, the use of Instagram as a teaching tool could have disadvantages that should be managed. In a study by Romero-Rodriguez et al. (2020), the researchers investigated the intense usage of Instagram and the influence of smartphones as an addictive habit and reported the potential addictive nature of using Instagram. Another negative effect of using Instagram can be distraction of attention and concentration and the costs of internet access that were reported by Al Garawi (2019). Moreover, Rinda et al (2018) mentioned slow internet connection as a drawback of using Instagram as a teaching tool.

Methodology

This systematic review was conducted within the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) framework proposed by Moher et al. (2009).

Inclusion and Exclusion Criteria

The present study consulted the *Chocrane Handbook for Systematic Reviews of Interventions* (2011) and aimed to theoretically contribute to the research by providing synthesis of data from peer-reviewed empirical research papers and their results. To do so, the authors set out the following inclusion criteria:

- Peer-reviewed published academic articles
- Studies done in context of English as a foreign language (EFL) or English as a second language (ESL)
- Studies investigated the use of Instagram as a mobile-assisted language learning tool (pre/quasi-) experimental study
- Experimental studies with quantitative and mixed-methods designs in which the findings (effectiveness of intervention) were reported

The exclusion criteria considered in this systematic review were as follows:

- Book chapters, research abstracts, theses, and dissertations
- Unpublished articles (theses, dissertations)
- Studies investigated and reported merely learners' perceptions, motivation, or attitudes
- Non-experimental survey

Instruments

In order to compute the treatment effects (the effect size) and display the forest plot as the key element of the meta-analysis, the researchers used Stata software version 17. For the bibliometric analysis, the authors consulted the bibliometric analysis toolbox proposed by Donthu et al. (2021) and used VOS viewer (van Eck and Waltman, 2010) for data visualization.

Procedures

Search Strategy and Data Retrieval

In the phase of identification, the corpus of studies was mainly retrieved from six academic databases, including Web of Science, Scopus, ERIC (ProQuest), Education Source (EBSCO), and PsycINFO. In addition, a manual exhaustive search was conducted through Google Scholar to explore the publications in the periodicals that were not indexed in the above-mentioned databases. Furthermore, snowball sampling was implemented on the references cited in the articles to find more related studies and avoid missing references.

A comprehensive search was conducted by the researchers in early January 2023 as follows: TITLE-ABS-KEY (Instagram) AND TITLE-ABS-KEY (English OR speaking OR grammar OR listening OR writing OR reading) AND TITLE-ABS-KEY (teach* OR learn* OR train* OR educat* OR instruct* OR course* OR program* OR curriculum*). As the public release of Instagram was in 2010, no time limitations or filters were applied to the searches. As a result, 685 articles and conference proceedings were generated and 81 articles were manually searched and found through Google Scholar. All 766 records were imported to EndNote version 20.4.1 to be prepared for the first stage of PRIMSA, namely screening. First, duplicates were found by searching through the titles, authors, and year of publication. 194 duplicate

records were found and removed and 572 remained for the second phase, screening the titles and abstracts.

As the second step of the screening phase, the titles and abstracts were reviewed one by one, and 481 records were either found irrelevant or did not meet the inclusion criteria. Therefore, they were transferred to a separate folder in EndNote for exclusion upon the approval of the second reviewer. In cases of contradictory opinions, the third researcher was invited to help reach a consensus through discussion. Lastly, 91 records were selected for the eligibility phase and full-text reading. The selected articles were searched online and their full-text files were downloaded. After a careful dual screening of the full texts, 44 articles were excluded because some of them did not have any treatment/intervention, some were not in the context of ESL/EFL, some had not reported specifically on the effects of Instagram, some only investigated the learners' perception/motivation/attitude through a survey-method, and some were not (pre/quasi-) experimental. Finally, 48 articles were selected to be included in the systematic review among which 11 studies met the requirements for the meta-analysis. Figure 1 reports a summary of the process in the PRISMA flowchart.

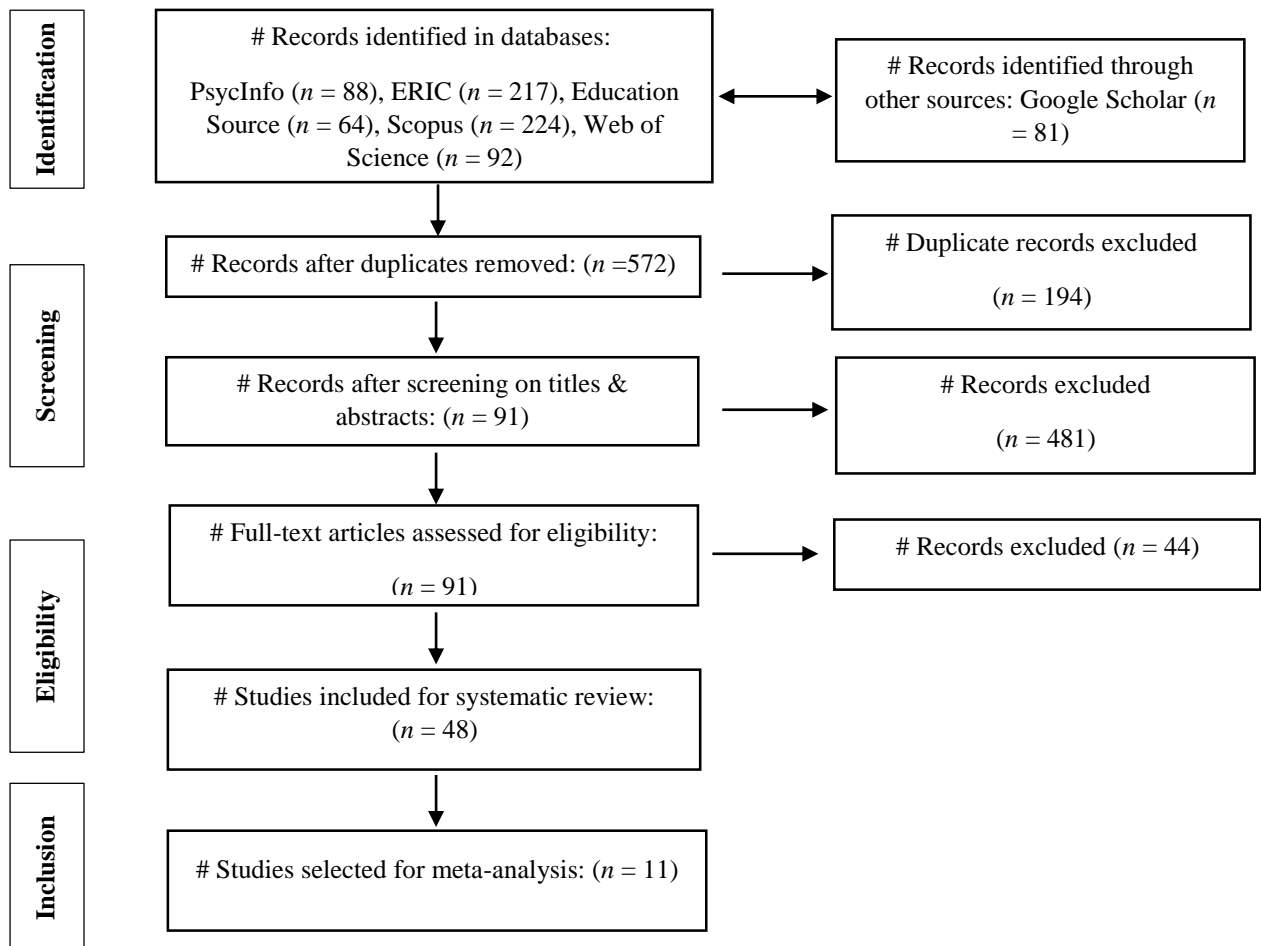


Figure 1. PRISMA Flowchart of Data Search and Retrieval

Extraction and Coding Process

For the data extraction and coding process, the coding guide recommended by Cooper (2010) was consulted, and the Cochrane data collection form for intervention studies version 3 (2014) was used. This form consisted of six main sections to retrieve information from different sections of the studies including the research design, participants, treatment/intervention, measurement, data analysis, and outcomes.

First, the researchers reviewed the included studies and extracted the general characteristics of the studies, including the title of the paper, name of the journal, year of publication, country, and the authors' names, and inserted them in the form. Second, for the methodological characteristics, one researcher read the studies one by one and inserted the related information in the form including the topical focus of the study, study design, number of participants, sampling method, description of the treatment, duration of the treatment, measurement tools and testing methods, data analysis method, and summary of the results. After the completion of the forms for each study, the second coder reviewed them to compare them with the full texts to make the necessary changes and avoid missing details. The approved data extraction forms were completed and prepared for critical appraisal.

Data Analysis

Coding and Inter-Rater Reliability

To compute the coefficient indicating the degree of accuracy and reliability of the agreement between the two coders (authors), Cohen's Kappa was used. For coding the reports in the phase of title and abstract screening after removing 194 duplicates, the two independent coders (authors) coded 378 reports against the inclusion criteria and easily selected 91 reports. This process yielded 97% agreement between the two judges (Cohen's $\kappa = 0.94$) which was almost perfect agreement. Afterward, in the eligibility phase, the researchers found and downloaded the full text of 91 articles. The judges coded them independently after reading the full texts and finally agreed to include 48 articles with 88.46% agreement (Cohen's $\kappa = 0.68$) which was a substantial agreement. The discrepancies were resolved by discussion until a 100% agreement was reached between the two coders. Then, the authors selected the studies, which were statistically appropriate for the meta-analysis. Out of the 48 included studies in the systematic review, the coders selected 11 studies in which the test results of the treatment and intervention of Instagram through a pre-test and post-test design were sufficiently statistically reported.

Bibliographic Information

Table 1 provides a bibliographic overview of the 11 studies that met the requirements for this meta-analysis. Among the studies, the focus of four studies was on writing skills, four studies focused on vocabulary, one study on grammar, one study on reading, and one study on the overall learning process. In our corpus of studies for the meta-analysis, four studies had been conducted in 2022 among which two studies were done in Indonesia, one in Iran, and one study was multinational with the contribution of authors from Iran, China, Bangladesh, Saudi Arabia, Afghanistan, and Egypt; one study was done in 2021 in Indonesia, one was in 2020 in

Indonesia, two studies in 2019 in Turkey and Indonesia, one in 2018 in Indonesia, one in 2017 in Indonesia, and one research study was done in 2016 in Iran.

Table 1. *An Overview of Selected Studies for Meta-Analysis*

Row	Author(s)	Year of publication	Research Design	Topical Focus	Country
1	Sallamah & Sabiq	2020	Quasi-experimental	Writing	Indonesia
2	Yadegarfar & Simin	2016	Quasi-experimental	Vocabulary	Iran
3	Erarslan	2019	Quasi-experimental	Learning	Turkey
4	Soviyah & Etikaningsih	2018	Quasi-experimental	Writing	Indonesia
5	Teng et al.	2022	Quasi-experimental	Grammar	Multinational
6	Auly et al.	2021	Quasi-experimental	Vocabulary	Indonesia
7	Dewi et al.	2022	Quasi-experimental	Reading	Indonesia
8	Kaviani	2022	Quasi-experimental	Vocabulary	Iran
9	Sulistiyorini & Rahmawati	2019	Quasi-experimental	Writing	Indonesia
10	Purwandari	2017	Quasi-experimental	Writing	Indonesia
11	Rosdiani et al.	2022	Quasi-experimental	Vocabulary	Indonesia

In Table 2, a bibliographic overview of the other 37 included studies has been listed. Out of 48 studies, four (Kahlitova & Gimaletdinova, 2017; Sulistiyorini & Rahmawati, 2019) were international conference proceedings.

Table 2. *An Overview of Other Included Studies*

Row	Author(s)	Year of publication	Research Design	Topical Focus	Country
1	Zhussupova et al.	2022	Quasi-experimental	Vocabulary	Kazakhstan
2	Al-Ali	2014	Action research	Writing	UAE
3	Yusuf & Jazilah	2020	Pre-experimental	Writing	Indonesia
4	Andujar & Cakmak	2020	Pre-experimental	Learning	Multinational
5	Lestari & German	2021	Pre-experimental	Vocabulary	Indonesia
6	Shazali et al.	2019	Action research	Writing	Malaysia
7	Bestari et al.	2020	Pre-experimental	Writing	Indonesia
8	Avivi & Megawati	2020	Quasi-experimental	Writing	Indonesia
9	Sarangapani & Hashim	2022	Pre-experimental	Grammar	Malaysia
10	Mansor & Rahim	2017	Quasi-experimental	Writing	Malaysia
11	Khalitova & Gimaletdinova	2016	Quasi-experimental	Listening	Russia
12	Zafar	2019	Quasi-experimental	Writing	Poland
13	Rinda	2018	Pre-experimental	Writing	Indonesia
14	Aini	2020	Pre-experimental	Speaking	Indonesia
15	Akhiar et al.	2017	Quasi-experimental	Writing	Malaysia
16	Hilman	2019	Quasi-experimental	Writing	Indonesia
17	Desa et al.	2019	Pre-experimental	Writing	Malaysia
18	Listiani	2016	Quasi-experimental	Writing	Indonesia

19	Devana & Afifah	2020	Quasi-experimental	Speaking	Indonesia
20	Dewi et al.	2022	Pre-experimental	Speaking	Indonesia
21	Thomas	2019	Quasi-experimental	Vocabulary	Japan
22	Yeh & Mitric	2020	Pre-experimental	Writing	USA
23	Ahmadi & Tabatabaei	2021	Quasi-experimental	Vocabulary	Iran
24	Wulandari	2019	Quasi-experimental	Speaking	Indonesia
25	Saleh & Muhayyag	2021	Pre-experimental	Writing	Indonesia
26	Rahmawati & Musyarofah	2020	Action research	Writing	Indonesia
27	Saputri et al.	2021	Pre-experimental	Writing	Indonesia
28	Alghamdi	2022	Pre-experimental	Writing	Saudi Arabia
29	Nugroho & Rahmawati	2020	Quasi-experimental	Writing	Indonesia
30	Ramadoni	2019	Quasi-experimental	Speaking	Indonesia
31	Handayani et al.	2018	Pre-experimental	Writing	Indonesia
32	Nurdiansyah & Abdulrahman	2020	Quasi-experimental	Writing	Indonesia
33	Kencana & Fauzia	2022	Quasi-experimental	Writing	Indonesia
34	Ghooryan & Salehi	2022	Quasi-experimental	Vocabulary	Iran
35	Kartini	2021	Quasi-experimental	Speaking	Indonesia
36	Qisthi	2020	Quasi-experimental	Vocabulary	Indonesia
37	Rakhmanina & Yuneva	2018	Quasi-experimental	Writing	Indonesia

Meta-Analysis

For the computation of effect sizes, Stata version 17 software was used, with the weighted mean difference as the metric of the effect size. To do so, the process was conducted in two stages. The first stage involved the calculation of a measure of the treatment effect with a 95% confidence interval (CI) for each study. In the second stage, the treatment effect size was measured from the means of the pre- and posttests of the control and experimental groups, standard deviations (SD) and number of participants in both groups were used.

The percentage of variation across the studies was determined by the value of I^2 . As I^2 was higher than 50%, the researchers adopted a random-effect model to carry out the meta-analysis. Moreover, the researchers conducted a sensitivity analysis and identified the results' stability and adopted both Begg's and Egger's tests to find publication bias.

Findings and Discussion

Meta-Analysis

The researchers calculated eleven eligible studies and effect sizes to find out the effect size of Instagram's use in ESL/EFL. The researchers applied a random-effects model instead of random errors ($I^2 = 100%$, $p < .01$) as the percentage of the variance of the effect sizes was due to heterogeneity. The meta-analysis approved that Instagram's use is effective and significant (ES = 7.30, CI: 5.71, 8.89).

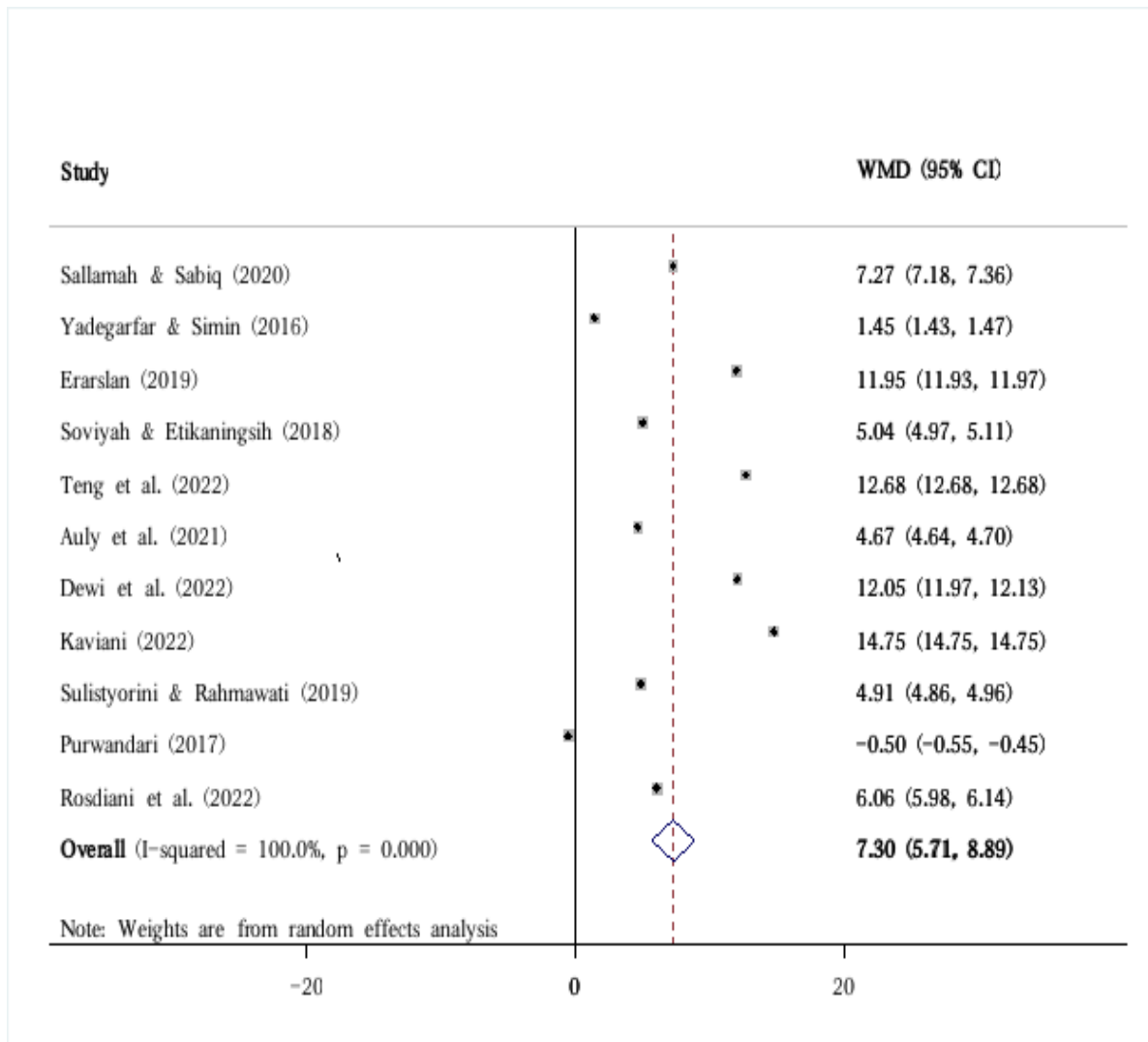


Figure 2. Forest Plot of the Effectiveness of Using Instagram. WMD: Weighted Mean Difference

Moreover, the effect sizes of eleven eligible studies were calculated based on the topical foci of the studies, and significant effects were found on teaching writing and vocabulary. Figure 2 illustrates the weighted mean difference. Since only one study with topical focus on grammar, speaking, and overall learning for each was found eligible for meta-analysis, so their weights are not considered statistically meaningful.

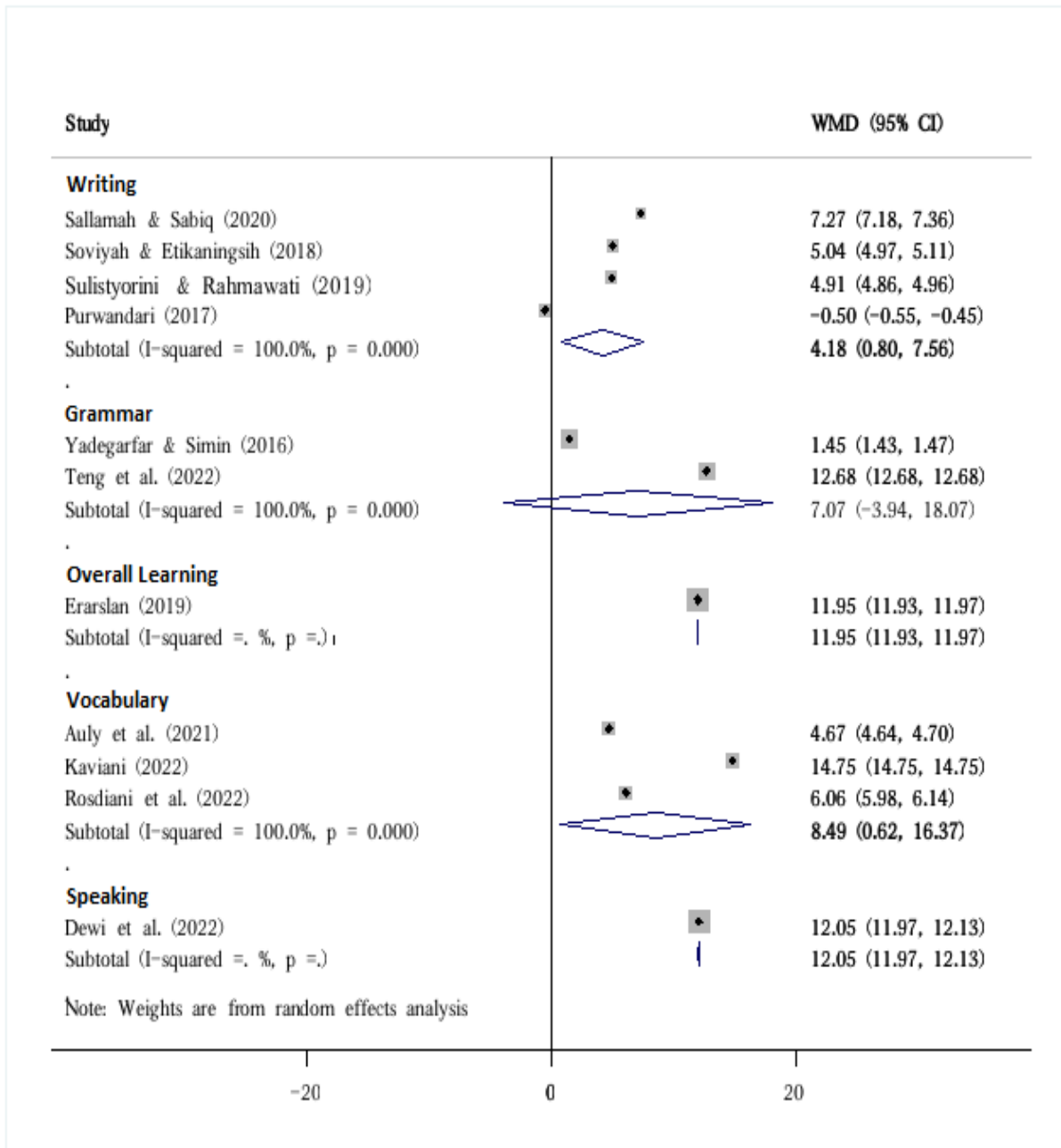


Figure 3. Forest Plot of the Effectiveness of Using Instagram in ESL/EFL Based on Research Focus

Sensitivity Analysis

Sensitivity analysis is done when the eligibility of some studies in the meta-analysis may not be certain as they do not report or contain full details. So, we conducted a sensitivity analysis of the included studies for our meta-analysis. The results indicated that all the studies were within 95% confidence intervals and the estimates of the meta-analysis were stable and reliable.

Table 3. *Sensitivity Analysis Results*

Studies	Coef.	[95% Conf. Interval]	
Sallamah & Sabiq	7.306056	5.6393366	8.9727755
Yadegarfar & Simin	7.8882389	6.7216449	9.0548325
Erarslan	6.8380122	5.1443148	8.5317097
Soviyah & Etikaningsih	7.529036	5.8685637	9.1895084
Teng et al.	6.7649994	2.1153228	11.414676
Auly et al.	7.5660777	5.9388552	9.1933002
Dewi et al.	6.8281231	5.1574092	8.4988365
Kaviani	6.5579948	2.6598713	10.456119
Sulistiyorini & Rahmawati	7.5420632	5.8929467	9.1911793
Purwandari	8.0830746	6.47719	9.6889582
Rosdiani et al.	7.427043	5.763442	9.0906439
Combined	7.3027787	5.7115621	8.8939953

Publication bias

Begg's test is an adjusted correlation test, which is a testing technique for the publication bias in a meta-analysis and was proposed by Begg and Mazumdar (1994). Egger's test that was proposed by Egger et al. (1997) examines whether there is asymmetry in a funnel plot that compares a meta-analysis of small size with studies that have large samples. We conducted those tests and resulted in Egger's test ($p = 0.16$) and Begg's test ($p = 0.31$) that indicate the absence of publication bias in the included studies in this systematic review.

Bibliometric Analysis

For bibliometric analysis, the VOS viewer program was used to produce network visualization of the most used keywords and co-occurrence analysis. The data from 48 studies were inserted in the EndNote and a file in RIS format was exported from EndNote and inserted into the VOS viewer. Totally, 137 keywords were counted in 48 articles and finally, 78 unique keywords were found because some of the keywords were interchangeable, some had the same concept, and some of them were unrelated and omitted. Figure 4 illustrates the co-occurrence of the keywords through network visualization.

These 78 keywords are in 16 clusters that are differentiated by different colors. The number of total links among the keywords was 267 and the total link strength was 345. As can be seen in Figure 4, some keywords have more occurrences and are bolder and bigger with more links in the network. Writing and vocabulary are the two topical foci (keywords) of the studies that have had the most occurrence, and this indicates that these two language areas have been the most-studied independent variables to investigate the effects of using Instagram in ESL/EFL.

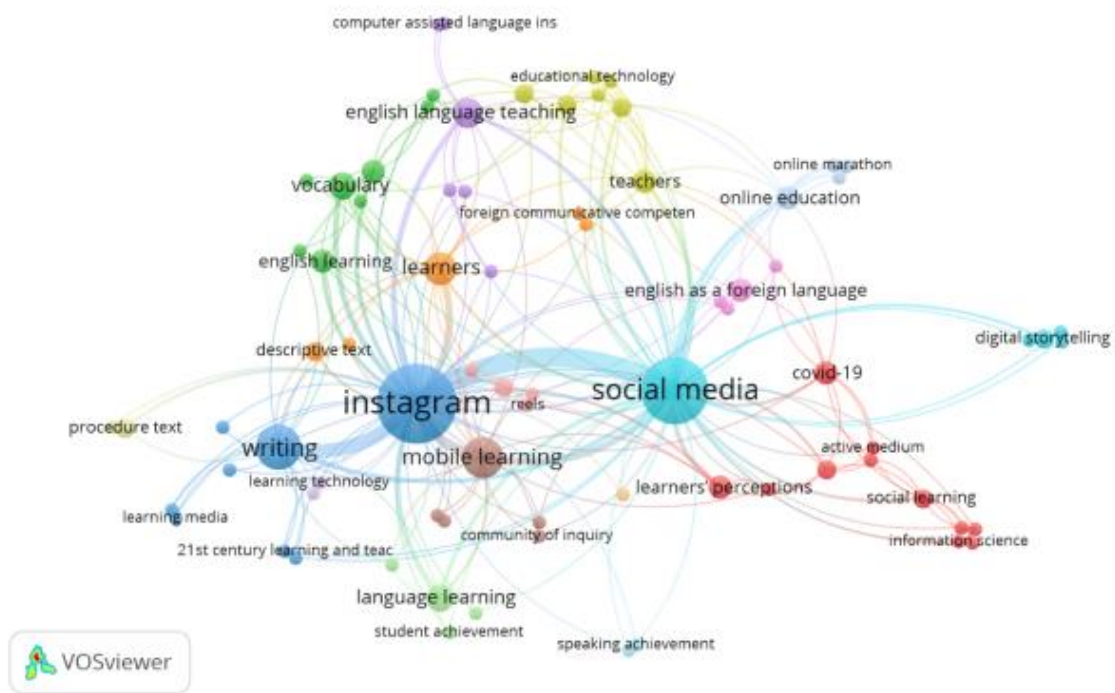


Figure 4. *The Network Visualization of the Co-occurrence of the Keywords*

The density visualization of the keywords is shown in Figure 5, in which each keyword that is in or near the yellow area means that it has occurred more times in 48 studies.

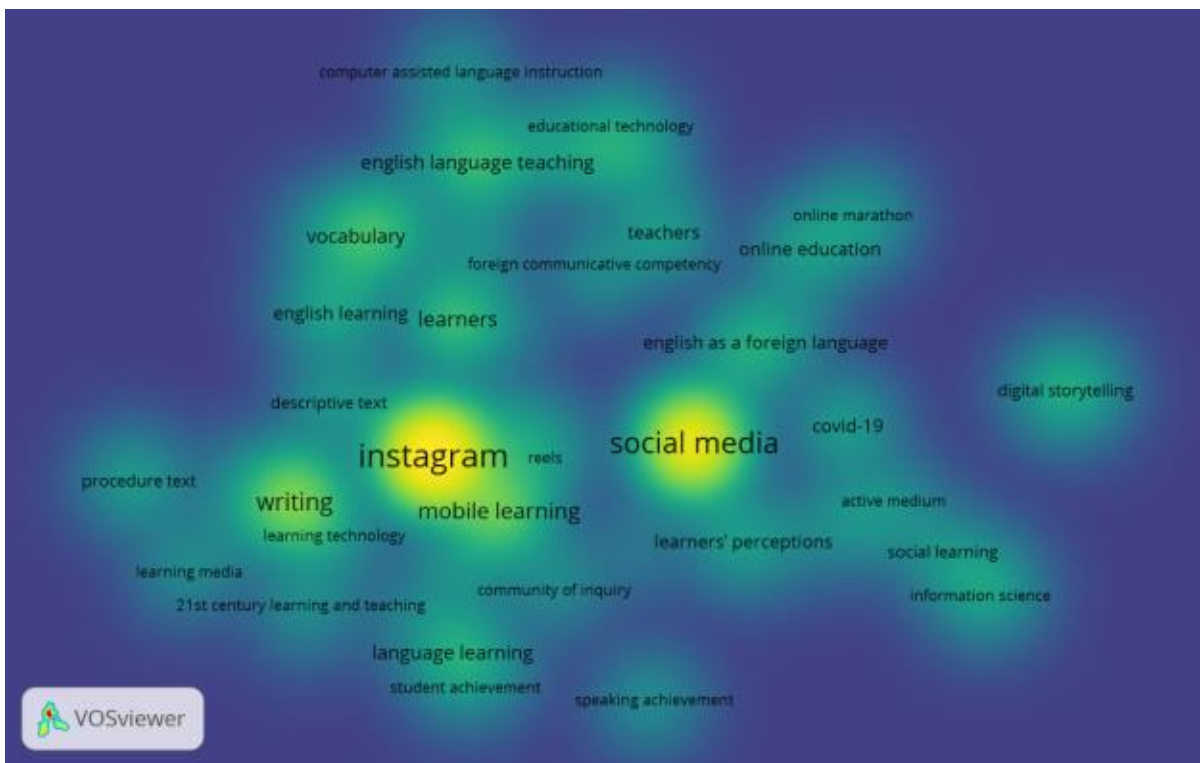


Figure 5. *The Density Visualization of the Occurrence of Keywords*

Apart from the network visualization (Figure 4) in which the colors differentiate the names of the clusters, Figure 6 shows the publications trend and the colors are related to the years. As you can see in Figure 6, it displays the occurrence of the keywords chronologically from the oldest to the newest articles. The newest subjects include Instagram reels, speaking achievements, digital storytelling and vocabulary. Moving backward in time the subjects include writing, learners’ perceptions, and descriptive text.

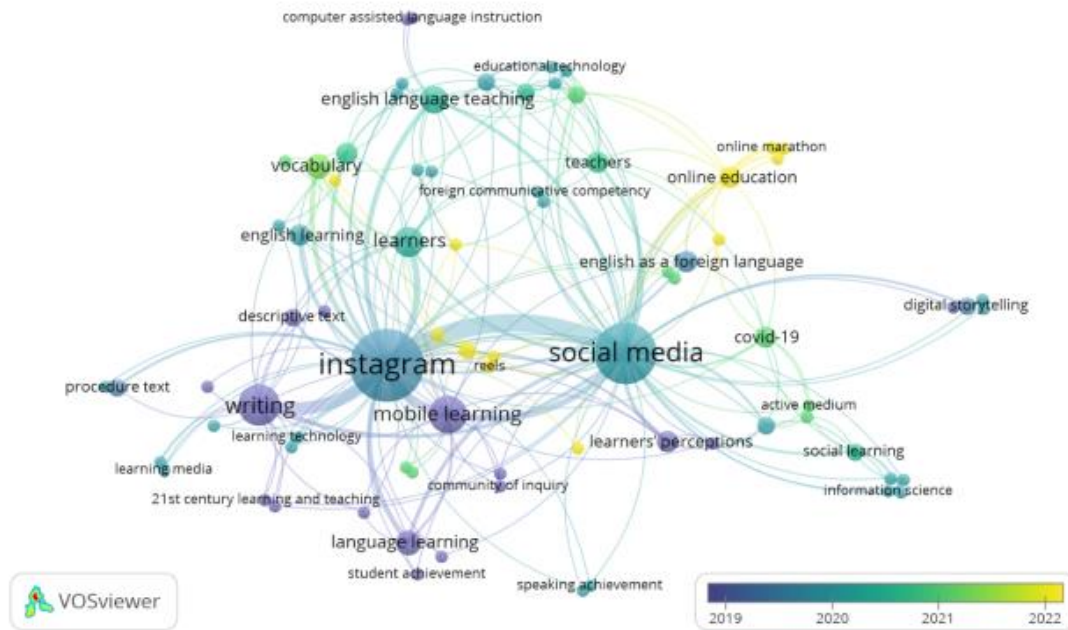


Figure 6. *The Visualization of Distribution of the Keywords Across Time*

Topical Focus of the Studies

Table 4 reports the topical focus of the corpus of studies included in this review investigating the effects of Instagram on a language area or skill of ESL/EFL learners. It is evident that the focus of almost 48% of the studies was on writing skills as a dependent variable to examine and measure the effectiveness of using Instagram in an EFL/ESL context, 23% of the studies put vocabulary learning as the focus of the research, 4% chose grammar and accuracy, and nearly 15% focused on speaking skills. Reading and listening skills were the least foci of the studies. Three studies investigated and measured the overall learning process and output.

Table 4. *Descriptive Statistics of the Research Foci*

Dependent Variable	Frequency
Reading	1
Writing	24
Listening	1
Speaking	7
Vocabulary	11
Grammar	2
Others (overall output, the learning process)	2
Total	48

Time Distribution of the Studies

Figure 7 illustrates the distribution of the studies conducted between 2014 and late 2022; this review explored the literature in January 2023. The line graph indicates that there have been fluctuations in the publications, but the trend in the research and publications has been upward. Although there was a downfall in the research in 2021, the research area resumed its growth and productivity in 2022.

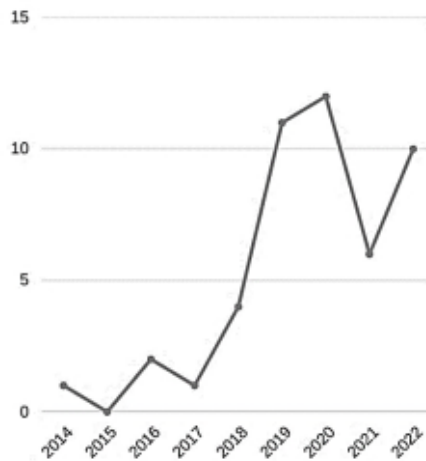


Figure 7. *Research Growth and Trend*

Considering the publication years of the 48 studies included in this review, we can see that a handful of experimental studies may have been found before 2018; however, the growth of interest in the research began in 2018 involving 8.5% of the publications ($N = 4$) and has continued to this date. In sum, most of the studies were carried out in 2019 and 2020 each year taking up 25% ($N = 12$) of the total publications. However, a drop in the research is obvious in 2021 when the number of publications fell nearly half of its previous and next year ($N = 6$). In 2022, the number of publications and research grew and reached almost 21% ($N = 10$).

Geographical Distribution of the Studies

The countries in which the researchers conducted their experimental studies showed that Indonesian researchers with 30 publications (62.5%) and Iranian and Malaysian researchers each with 4 publications (8.3%) have made the most contribution to this research area through their peer-reviewed empirical studies. The researchers from other countries who had at least one experimental study in this review included the USA, Turkey, Japan, UAE, Kazakhstan, Russia, Poland, Saudi Arabia, and Spain. Two articles were multinational by authors from different countries: one was conducted in Spain by two authors from Turkey and Spain, and the other was conducted in Iran by co-authors from China, Iran, Bangladesh, Saudi Arabia, Afghanistan, and Egypt.

Citation Analysis

To find the most influential publications, the authors scanned the references of 48 studies. After a careful count of the references, the most influential studies that had the most frequency as references mentioned by other researchers were found manually. The most frequently

mentioned and referred studies were as follows: Al-Ali (2014), cited in 16 articles out of 48 studies, was the most influential author in the body of the research. Listiani (2016), Mansor and Rahim (2017), Akhlar et al. (2017), Erarslan (2019), Handayani (2016), and Handayani (2018) were the most influential publications in this empirical research field. In the ranking, Soviyah and Etikaningsih (2018), Khalitova and Gimaletdinova (2016), and Yadegarifar and Simin (2016) respectively took lower places as influential publications.

Table 5. *The Most Influential Authors (Publications)*

Author(s)	No. of citations in articles	The percentage of citations
Al-Ali (2014)	16	34%
Listiani (2016)	12	25%
Mansor and Rahim (2017)	10	21%
Akhlar et al. (2019)	9	19%
Erarslan (2019)	8	17%
Handayani (2016)	8	17%
Handayani (2018)	7	14%
Soviyah and Etikaningsih (2018)	5	10.5%
Shazali et al. (2019)	5	10.5%
Yadegarifar and Simin	4	8%
Khalitova and Gimaletdinova (2016)	4	8%

Discussion

All studies selected for the meta-analysis were quasi-experimental and conducted based on a pre-test and post-test design. The research design of 15 articles (Alghamdi, 2022; Andujar & Cakmak, 2020; Desa et al., 2019; Dewi et al., 2022, Handayani et al., 2018; Lestari & German, 2021; Rinda et al., 2018; Saleh & Muhayyng, 2021; Sarangapani & Hashim, 2022; Yeh & Mitric, 2020; Yusuf & Jazilah, 2020) was pre-experimental, i.e., one group study without a control group, and 33 studies were quasi-experimental. Three studies (Rahmawati & Musyarofah, 2020) were classroom action research, among which only Shazali et al. (2018) was pre-experimental. In the action research, the researchers applied modifications on the run to respond to the students' feedback and went through four phases of planning, acting, observing, and reflecting throughout the experiment. The purpose of all studies was to investigate the effects of using Instagram as an independent variable on the language skill or learning process of the learners as the dependent variable.

For the data collection about learners' attitudes and perceptions, except in 17 articles (Ahmadi & Tabatabaei, 2021; Auly et al., 2021; Ghooriyan & Salehi, 2022; Handayani, 2018; Kaviani, 2022; Kencana & Fauzia, 2022; Purwandari, 2017; Rahmawati & Musyarofah, 2020; Ramadoni, 2019; Rosdiani et al., 2022; Sallamah & Sabiq, 2020; and Soviyah & Etikaningsih, 2018.), in 63% of the studies (N = 31), a survey-method including an opinion-based questionnaire and/or a semi-structured interview were administered and their results all confirmed the learners' positive attitude and perception toward using Instagram in ESL/EFL teaching and learning. In the mixed-method studies, the researchers developed and distributed Likert-scale and open-ended questionnaires to inquire about the learners' experience of

learning through Instagram. In 8 articles (Alghamdi, 2022; Andujar & Cakmak, 2020; Desa et al., 2019; Dewi et al., 2022; Erarslan 2019; Saleh & Muhayyang, 2021) the researchers conducted semi-structured interviews or administered open and close ended questionnaires for an in-depth understanding of the learners' learning experience, satisfaction, and perception. In some studies such as Erarslan (2019), the researcher used two raters for the data gathered from interviews and calculated inter-rater reliability; in studies that close-ended questionnaire with Likert-scale format was used such as Desa et al (2019), the mean scores were used in the analysis.

The experiments (Instagram's integration) of 24 articles investigated learners' writing skills. Almost all of them used posting photos and writing descriptive text in the caption as a means of teaching writing, exercising, peer feedback from other students, and corrective feedback from the teacher. However, Handayani et al. (2018) posted videos as input to engage and assign the students to write descriptive text in the comments section. All the studies had a process approach to teaching and practicing writing through Instagram, but Avivi and Megawati (2021) explained this process very well in their study. At first, the students learned how to plan their writing and make an outline; then, they were assigned to choose a topic, find a picture and post it on Instagram to write a descriptive text in the caption. Next, the teacher gave feedback in the comments about their writing in the caption. The students had to revise their descriptive caption based on the teacher's comments and edit it. Lastly, it was the other students' turn to leave comments about the descriptive text in the caption and give feedback or share their ideas. In a study done by Sallamah & Sabiq (2020), over and above posting pictures, writing captions, and leaving comments, the researchers used the Instagram Live feature as a forum for the oral presentation of the lesson and more discussion about the writing structure and peer feedback. In the action research conducted by Rahmawati & Yuneva (2018), the teacher posted a picture series of making food and beverages on Instagram to teach procedure writing. Then, they assigned the students to choose a topic for procedure writing, post their picture series, and write in the caption. Yeh and Mitric (2020) had a different procedure for teaching writing through Instagram. First, they investigated the participants' knowledge of Instagram, provided them with examples of Instagram, and asked them to choose a theme or topic of interest, a new identity, and create a new account. The students were assigned to search for similar posts and read their captions. Then, they had to re-post their favorite post but write their description. In the next phase, the participants were assigned to choose a subject from the real world, post a related video or picture, and write their own story. The students' posts were discussed in the class and received feedback.

Seven studies focused on speaking skills. All the studies used the videos-uploading feature of Instagram through posting, IGTV, or making Reels about the topics given to them in the classroom to post on their private Instagram accounts or the account created by the teacher/researcher as a vlog. For instance, Devana & Afifah (2020) made groups of students and taught them how to speak about their chosen topic. The students wrote their speaking text and rehearsed speaking before shooting their videos. Each group made an Instagram account to upload their speaking videos. Gradually, they made a vlog and could track their progress in their speaking skills, and the teacher monitored their outputs.

The focus of eleven studies was vocabulary learning. In all the studies except July et al. (2021) and Lestari and German (2021), the researchers posted a picture related to the new word(s) followed by a description in the caption, including the definition and an example. Then they engaged the students to participate by asking them to leave comments, give their examples, and receive peer feedback and feedback from the teacher as well. In the study by Auly et al. (2021), the researcher used Instagram filters to teach new vocabulary and make questions for the learners to answer. The filters were stickers on the teacher's picture on which the new words were written or questions were asked, followed by a description in the caption. Lestari and German (2021) posted images related to the new word and uploaded short videos teaching new vocabulary on the whiteboard.

Two studies focused on grammar. Sarangapani and Hashim (2022) used Instagram Reels to engage the students by recording themselves and giving an example of the grammar learned in the classroom as the output. Teng et al. (2022) used Instagram posting features including images, audio, and video posts to teach and practice grammar lessons. Khalitova and Gimaletdinova (2016) concentrated on listening skills and used Instagram to post authentic videos for up to 20 seconds to practice listening outside of the class and complete the listening task given in the classroom. Dewi et al. (2022) investigated the effectiveness of Instagram on reading skills. The researchers benefited from the photo and video sharing feature of Instagram for a short text or story in the caption to provide the students with an embedded context for reading comprehension. They used Instagram as the learners' favorite media to increase their participation, inspire them, and make them more excited and productive.

Having studied the procedures of the experiments, the authors summarized the Instagram features used by the researcher/teachers and the learners in the studies in Table 6.

Table 6. A Summary of Instagram Features Used in the Research

Instagram Feature	Function	Role (used as/for)
Comments	Output (language production) and feedback (interactional)	Peer feedback, corrective feedback, sharing ideas
Captions	Output (language production)	Storytelling, description
photos/videos post	Input (content/materials) and output (contextualization) (language production)	Eliciting and stimulating, presenting, teaching
Live	Forum, online class (procedural)	Discussion, teaching
Reels	Output (language production)	Speaking
Filters	Input (instrumental)	Teaching vocabulary

In studies with a focus on writing, posting videos or pictures was mostly used as an embedded context for the learner's outputs and language production in storytelling, describing, and recounting text. Captions on the posts were mostly used as a place for the learners' language production to describe the picture or tell a short story in relation to the picture chosen and posted. The teachers used photo/video posts as their input for learners to present the content and materials in order to elicit responses, stimulate, or teach a point, vocabulary, or grammar directly. In studies with a focus on speaking, posting videos were used as a medium for presenting oral language production. The learners filmed themselves out of the class speaking on a given topic discussed and chosen in the class and posted it for the view of classmates and

receiving their feedback in the Comment section. The comment section was used as a hub for giving and collecting peer feedback on language production and sharing ideas. The comment section under the posts was an opportunity for the learners to interact with each other. Live sessions on Instagram were used only as a possibility for remote teaching and distance learning to hold the class for teaching and discussion. Reels were used for presenting oral language production in response to a given task with the same function as posting a video. Filters of Instagram selfies (pictures) were used by the teacher as virtual realia to simplify the meaning, give an example, or elicit the meaning from the learners in teaching vocabulary.

All the studies included in this review were experimental and examined Instagram's intervention. In the body of the research, the duration of the experiments ranged from at least six sessions to one semester, and the participants were various young learners from English language institutes and schools to university students.

Although most research studies (62.5%) had a focus on writing skills, or only one study focused on teaching reading and listening, Instagram is a multimodal social media platform with audio, video, written, and pictorial options as well as filters to decorate videos and pictures, and emojis to add emotions and signs to the texts capable of providing capacities for teaching all language areas and skills.

Even though only uploading real pictures, writing a caption for storytelling or description, and leaving comments as feedback or output were the most used features of Instagram in ESL/EFL studies, there are many other features to be used and investigated in ESL/EFL context, such as the Story feature for capturing photos and videos and posting in a slideshow format with text and drawing tools that disappear in 24 h. Stories can be used for providing the learners outside the class with daily tips, new words, grammar points, examples, etc. to be read, recalled, or memorized by learners at their own pace, anywhere and anytime they can. Stories can be saved as Highlights on the top of the page and kept as long as needed, for example until the next session or week with the new subjects. The layout feature is for combining multiple photos into a single image and can be used for instance to show a process or a series of actions. Through Layout, the teachers can make varieties in a single post and deliver multipartite content (e.g., subcategories of a word or verb) in one picture post. Pictures can be a lesson point written and designed by the teacher via Instagram or other mobile applications or they can be an image related to the lesson given in the Caption for contextualization, stimulation, and elicitation.

In none of the studies, the teachers used a warm-up activity before giving assignments or teaching through Instagram. Students can search a topic, video, picture, or text through Hashtags to explore posts, comments, captions, and accounts as a warm-up activity.

Conclusion

This study reviewed a corpus of empirical research investigating the use of Instagram as a mobile-assisted language learning tool in ESL/EFL from the date of its release in 2010 to January 2023. All the studies reported positive results from the experiments and confirmed the positive effects of using Instagram through both the test results and the surveys that inquired about the learners' perceptions, attitudes, and opinions.

Considering the results of previous studies in the literature, and with reference to the findings of the systematic review and bibliometric analysis of 48 articles, as well as the meta-analysis of 11 studies in this study, the authors found that Instagram is an effective mobile-assisted language learning tool in ESL/EFL and has capacities for educational purposes in English language teaching and learning. It was concluded that Instagram can be a useful tool for keeping in touch with learners by delivering educational content to be received by learners anywhere and anytime outside the classroom. Moreover, Instagram can be used as a supplementary tool in the classroom for motivating, encouraging, and involving students and increasing their interaction via mobile and Instagram; or as the main medium of instruction for distance learning.

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