

REVIEW ARTICLE

A Systematic Literature Review of Web-based Tools Application in ESL and EFL Writing Classes

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ABSTRACT – The 1990s saw the advent of internet use, eventually termed as web 1.0. Embracing this technological evolution, language learning classrooms have been using this digital tool in the teaching and learning processes. The paper systematically analysed the literature on this digital use for writing in ESL/EFL classes published between 1990 and 2023, aiming at identifying the most frequently used web-based tools in writing classes, exploring their facilitative features in developing learner's writing skills and evaluating their effects on the development of varied writing types. Ninety-three articles retrieved from five major databases - Science Direct, Scopus, SpringerLink, Taylor & Francis and Web of Science - were analysed using the content analysis method. Findings revealed that writing classes in recent years have been primarily utilising social media channels, such as Facebook, collaborative authoring platforms, for example, Google Docs and data-driven learning tools like Corpus, optimising the interactive and interconnectedness of these applications. Further exploration disclosed the facilitative features contributed mainly by the interactive element of the web, enabling teaching and learning of writing to take place in and outside of the classroom. Discussions also highlighted certain facilitative features perused in relation to different types of writing. This review affirms the facilitative benefits of web technology in enhancing the learners' writing skills. It concludes by suggesting future studies for the teaching and learning writing for ESL and EFL learners.

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INTRODUCTION

The utilisation of technology in the classroom opens up enormous opportunities for all involved, such as regulating learners with individualised learning, equipping learners with the much-needed skills of the 21st century and providing instructors with abundant access to authentic and diversified materials and resources (Bryant et al., 2020). Moreover, the pandemic has ensured the certainty of technology development and its inclusion in education. At the global scale, educational institutions are striving to transform programmes and instructions with the integration of technological and digital tools, and it has become evident that investment into technology in education is a vital agenda.

Technology use in language teaching and learning echoes the world's practices. The integrations of technology to enhance language teaching and learning have been reported in a good number of studies since the mid-20th century, and in particular, the use of web-based tools in the teaching and learning of writing in ESL and EFL classrooms has been extensively researched. These studies have discussed integrating digital tools from various angles, such as efficacy, attitudes, and motivation, bearing both advantages and disadvantages of these learning instruments. These reported studies show a trend of using different types of technology, moving from individual computer-based to a more social and interactive web-based integration.

LITERATURE REVIEW

The Web which made its way into the masses approximately in the mid-1990s has become more ubiquitous in recent years, as reported in many studies (Chen, 2016; Dede, 1996; Dousti & Amirian, 2023; Lee et al., 2020; Schmid et al., 2014; Su et al., 2023; Zhang & Zou, 2022) and language educators have been making use of these digital wonders to facilitate learners in the development of different language skills. In the realm of writing skills, the boons and the banes of these web-based apps, like Facebook, Wikis and Blogs have been illustrated through extensive use in various learning contexts (Alberth, 2019; Barrot, 2016; Barrot, 2021; Canham, 2018; Dizon, 2016; Kuimova & Zvekov, 2016; Susanto et al., 2020) and more recently, the use of artificial intelligence (AI), such as Chatbot is becoming more common in the

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realm of teaching and learning (Huang et al., 2022; Yan, 2023). However, studies integrating AI focusing specifically on writing are still scant, where most reported literature research revolves around learning in various fields.

Many studies have reported the effective use of web-based tools in facilitating collaborative writing tasks (Ho, 2020; Jiang & Eslami, 2022; Kılıçkaya, 2020). Utilised as computer-mediated communications, Wikis, Google Docs and Facebook, for instance, have been proposed as providing access to collaborative platforms primarily for group interactions (Cho, 2017; Li & Zhu, 2017), asynchronous editing of written work (Abrams, 2019; Wang, 2015) and learning resources (Selcuk et al., 2019; Woo et al., 2013). A more recent trend of employing augmented reality (AR) in writing classes exhibits a facilitative environment for learners' writing skills development (Chen et al., 2020; Lin et al., 2020). Current and emerging trends of web-based apps utilised in writing classes have furnished learners with varied and creative means of learning and learner engagement.

Reports from the vast number of studies may have revealed arrays of results. Some have discussed these tools' facilitative effects on developing learners' language accuracy, fluency, and content development (Cao, 2015; Ebadi & Rahimi, 2017; Grami, 2020; Lucas, 2020). Others have suggested that cautions need to be taken in integrating these tools due, to some extent, results showing adverse effects in their empirical findings (Ahmadi & Besharati, 2017; Li et al., 2015; Wihastyanang et al., 2020). From another view, studies have also reported learners' attitudes towards the use of these web-based aids indicating acceptance as well as reluctance and resistance, thus influencing the development of their writing skills (He, 2016; Hosseini et al., 2020; John & Yunus, 2019; Lin, 2019).

Review Studies on the Use of Web-based Tools in Writing Classes

Other systematic literature review (SLR) studies have extensively analysed the use of technology tools in writing teaching and learning, such as Ahmadi and Marandi (2014), which focused on Wikis to scaffold collaborative learning and Al Wasy's (2020) study that explored the stages of writing, language context, learners' educational level and language proficiency level. Also, Chen's (2016) study, published between 1990 and 2010, examined the characteristics of technology-supported peer-feedback activities, focusing on synchronous and asynchronous types of peer interactions. Similarly, Cao et al. (2022) analysed studies that focused on peer feedback in writing classes, suggesting the efficacy of online peer feedback in contrast to offline peer feedback.

Another study by Çiftçi and Aslan (2019) examined studies between 2000 and 2017 on using computer-mediated communication (CMC) tools concerning the contexts, languages, learners, task types, writing stages and writing aspects. Focusing on collaborative writing, Stoddart et al. (2016) reported studies that utilised wikis to aid this type of writing task. More recently, also centred on collaborative writing, Zhang and Zou (2022) reviewed studies on the use and the effects of educational technologies on the learning outcomes and perceptions of learners engaged in technology-enhanced collaborative writing.

Since the advent of AI into the world of language teaching and learning, literature conveying review studies of AI integration has been reported in many publications in recent years. Zhang et al. (2023) performed a meta-analysis on 18 studies utilising Chatbot in language learning. They concluded that this web-based tool has facilitated various aspects of language learning, like language skills, learning outcomes and duration of instructions. In another review study, Kuhail et al. (2023) examined the use of chatbots in a broader educational domain, focusing on interactional elements of the widget. This study has also presented evidence of the effectiveness of using Chatbot in the learning process, with some challenges, such as lack of dataset training and distractions, as cited in several studies reviewed.

Although previous review studies synthesised the use of technological tools in diverse writing classes, focus on the various types of web-based tools for different writing tasks has yet to be emphasised. Thus, the current study attempted to review studies to address this issue, guided by the following three research questions:

1. What were the most frequently used web-based tools in teaching and learning writing in ESL/EFL classrooms between 1990 and 2023?
2. What features of these digital tools facilitate the development of ESL/EFL learners' writing skills?
3. How do these features affect the development of writing skills in different writing types?

METHODOLOGY

An extensive search of existing literature was carried out to identify studies published between 1990 and 2023 regarding the effectiveness of Web-based tools in facilitating ESL or EFL learners' writing development. 1990 was decided to be the starting point of the search because, according to Schmid et al. (2014) and Lee et al. (2020), that was the decade when the Internet generally first reached the masses with the availability of personal computers for teaching and learning purposes.

The literature search was conducted on five significant databases: Science Direct, Scopus, Springer Link, Taylor & Francis, and the Web of Science, which included only research articles. As summarised in Figure 1, this process went through three major stages.

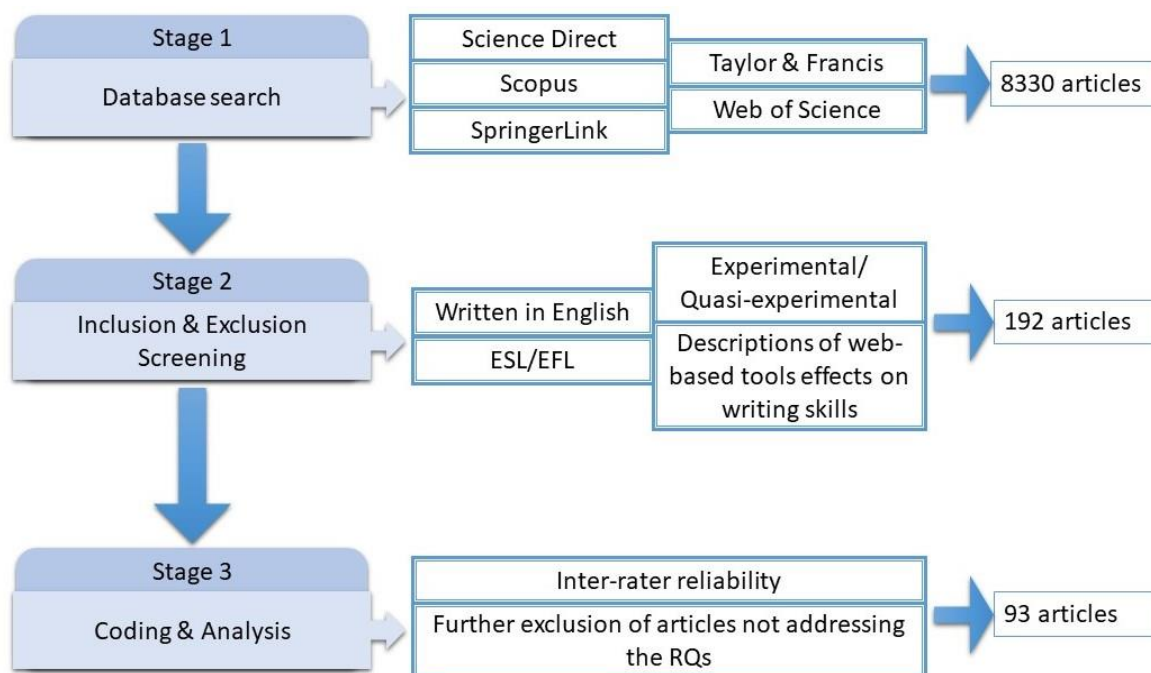


Figure 1. Three-stage review process.

Phase 1: Database Search

The first phase was conducting a database search using the search strings that are the combinations of the following keywords: a) writing; b) web, internet, online, software, technology, computer, laptop, digital, multimedia, blended; and c) ESL, EFL. In this first stage, after removing duplicates, 8330 articles potentially relevant to the study were retrieved from these five databases.

Phase 2: Inclusion and Exclusion Screening

In the second stage, the articles were screened for inclusion or exclusion to address the specific research questions of this review study. For this purpose, using the title, the abstract and the methodology section, the articles were screened based on the following criteria:

- The articles were written in English.
- The scope of the study was in the context of ESL or EFL.
- The articles reported empirical studies employing experimental or quasi-experimental methods.
- There was a considerable clear description of the effects of web-based tools on the development of writing skills.

Four hundred thirty-two articles were identified to have fulfilled all these criteria. Further thorough screening was conducted on these 432 articles, perusing the methodology, findings, and discussion sections. Articles that addressed the inclusion criteria and addressed the research questions were excluded. Articles excluded from the list reported learners' attitudes or perceptions towards web-based tools. Still, the findings and discussion did not discuss the effects of web-based tools on writing skills development, literature review, and meta-analysis papers. At the end of this phase, after excluding duplicates, 192 articles were selected to be reviewed to answer the research questions of the present study.

Phase 3: Coding and Analysis

The final stage was to code and analyse the articles. Two researchers coded approximately 25% of 192 articles separately to ensure inter-rater reliability. After thorough reading and coding of these articles, 93 articles were finally included in the analysis. Findings that addressed the research questions discussed in this paper were deduced from these 93 articles.

FINDINGS AND DISCUSSIONS

The Most Frequently Used Web-based Tools in the Teaching and Learning of Writing in ESL/EFL Classrooms between 1990 and 2023

The first question was to identify the web-based tools most frequently used in writing classes, as reported in studies published between 1990 and 2023. Figure 2 illustrates the number and different types of web-based tools utilised over three decades.

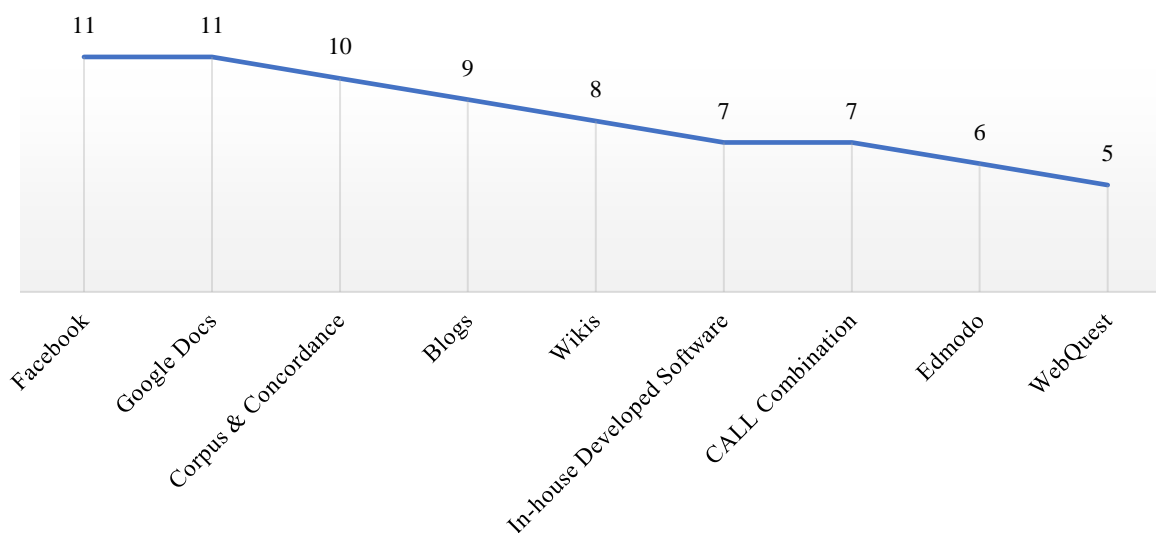


Figure 2. Most frequently used web-based tools in EFL/ESL writing classes.

Facebook topped the list with 11 studies reported for a decade (Abdallah & Mansour, 2015; Abdul Majid & Stapa, 2017; Alias et al., 2012; Altakhaineh & Al-Jallah, 2018; Barrot, 2016; 2021; Dizon, 2016; Razak & Saeed, 2014; Saeed & Ghazali, 2017; Shih, 2011; Yusof et al., 2012). With the same number of reported studies, Google Docs was also frequently used in writing classes, with the earliest report of use in 2015 (Ahmadi & Besharati, 2017; Alharbi, 2020; Hoang & Hoang, 2022; Dzekoe, 2017; Ebadi & Alizadeh, 2021; Ebadi & Rahimi, 2018; Fathi et al., 2021; Pham et al., 2020; Saeed & Al Qunayeer, 2020; Zheng et al., 2015). Corpus and Concordances, which were also common in writing classes, utilised varied types of corpora such as computer science lexical bundle (Birhan, 2021), PREFER, a corpus-based online aid to help learners with paraphrasing tasks (Chen et al., 2015), Google search (Kvashnina & Sumtsova, 2018), Chinese-English bilingual concordances (Yang et al., 2019), TANGO (Yeh et al., 2007), TOTALrecall combined with Corpus of Contemporary American English (COCA) (Liou, 2019) and W-matrix, which was a corpus containing samples of selected and organised language that occurs in natural setting (Wong, 2018). Apart from the in-house developed software, Reference Suite, Yoon (2016) also used Google search and dictionaries to aid learners in completing academic writing tasks. These uses of corpus and concordances were part of what was categorised as data-driven learning (DDL).

Blogs came in fourth (Cequeña, 2020; Fathi et al., 2019; James, 2016; Lin, 2014; Lin, 2015; Lin, 2019; Xu & Yu, 2018; Zheng & Warschauer, 2015), while Wikis followed very closely with eight reported uses in writing classrooms (Alshumaimeri, 2011; Li, 2013; Mak & Coniam, 2008; Wang, 2014; Wang, 2015; Woo et al., 2013). In addition, there were various types of in-house developed software used in writing classes, which included among others, Summary Writing-Pal (Chew et al., 2020), AccurIT ESL (Grami, 2020), Concise Collocation Checker (Grami & Alkezemi, 2016), Grammar Clinic (Li & Hegelheimer, 2013), E-Feedback (Tuzi, 2004), Process-Writing Wizard (Yeh et al., 2011) and Reference Suite (Yoon, 2016). More recently, Dugartsyrenova and Sardegna (2022) reported promising findings on using an in-house web-based tool, Online Academic Writing (OAW) tutor, to facilitate ESL learner's research proposal writing. These customised tools were developed by learning institutions to cater for the specific needs of their writing courses and the learners.

In some studies, combinations of varied digital tools were integrated into a writing course, and to list down these tools, they were grouped under the CALL combination in Figure 1. Abdallah and Mansour (2015) combined Facebook with a game-based software, "Second Life", in their task-based pragmatic writing tasks, such as resumes and email writing. Al-Jarf (2004) utilised the freeware Blackboard in combination with access to sources from websites such as "Yahoo Movies", "Yahoo Health", "WebMD", and "Encarta". Another study incorporated the use of Multimedia classes, which included, among others, an online dictionary, LAN and grammar check (Cao, 2015). Dzekoe (2017), in a computer-based multimodal composing activity (CBMCAs), used Google Docs, Glogster, and NaturalReader to facilitate learners' self-revision of their writing tasks. To enhance the tendency of learners to explore when completing writing tasks, James (2016) employed Quizlet, WebQuest, and Blog in a blended learning class. Focusing on enhanced self-learning and peer activities, a study combined Edpuzzle, Padlet and Google Docs in a scientific report writing class (Zou & Xie, 2019).

Edmodo, which was first launched in 2008, was a global learning network reported to be utilised in some selected studies (Ekmekci, 2017; Hosseinpour et al., 2019; Karami et al., 2019; Ma'azi & Janfeshan, 2018; Miftah, 2018), though now it is no longer used in writing classes after it was officially shut down in September 2022. Web-quest was also gaining popularity among language instructors as a tool to aid learners in developing their writing skills (Alshumaimeri & Bamanger, 2013; Awada et al., 2020; Dousti & Amirian, 2023; Ebadi & Rahimi, 2018; James, 2016). Other web-based tools reported in less than three studies selected for this analysis were not included in the findings and considered not to have fulfilled the criterion as being frequently used tools in ESL/EFL writing classes.

Features of the Web-based Tools that Facilitate the Development of ESL/EFL Learners' Writing Skills

This question probes further into technology integration in the teaching and learning of writing by analysing the facilitative features in developing ESL/EFL learners' writing skills. Examining the selected studies regarding the facilitation afforded by the digital tools discussed led to three main deductions.

Interactive Features for Both Synchronous and Asynchronous Writing Tasks

Tools like Facebook, Blogs, Google Docs, and Edmodo allowed whole group and subgroups discussions, which were facilitative for collaborative writing activities in both synchronous and asynchronous settings (Alharbi, 2020; Barrot, 2021; Chang & Lu, 2018; Ekmekçi, 2017; Hosseinpour et al., 2019; Razak & Saeed, 2014; Wang, 2015; Zheng et al., 2015). These features assisted learners in generating new ideas for content development cooperatively, and they were also facilitative in improving language use, such as word choice and grammatical accuracy in compositions. These were achieved through the postings that can be made in posts and message menus by both learners and instructors. Learners could write essays and post their compositions to be read by everyone or by the members of the subgroups, and comments on language use could be shared. All learners could make use of these comments to improve their writing piece. If the need arises, individual assessments could also be carried out on these platforms, such as Google Docs, with the instructor giving feedback to the learners' writings on time since these tools could be easily accessed regardless of time and space, provided that there was internet connection for synchronous discussions to take place. Asynchronous collaborative tasks were completed offline and could be accessed by intended participants when connected online.

Al Asadi (2020). For example, Ebadi and Rahimi (2018) and James (2016) conducted studies utilising WebQuest to enhance learners' engagement in collaborative writing tasks. Dodge (1997), who was the founder of this site, defined WebQuest as "an inquiry-oriented lesson format in which most or all the information that learners work with comes from the web" (p. 1). Each quest was structured into an Introduction, Task, Process, Conclusion, and Evaluation. These studies pointed out that the readings required by the pursuit enriched the learners' knowledge in general and vocabulary in particular, which could enhance written production. Citing Doughty and Long (2002), Ebadi and Rahimi's study inferred that the materials gathered online to complete the WebQuest tasks could be considered as providing the language input, equipped with "linguistic complexity, quality, quantity, variety, genuineness and relevance" (para. 3) which was needed to enhance writing. The other parts of WebQuest enabled learners to work collaboratively to produce well-developed written work.

Access to Language Inputs and Learning Materials from Both Natural and Controlled Settings

Another facilitative feature of these web-based tools in assisting learners in developing their writing skills was the affordance of rich learning resources. For instance, McEnery et al. (2006) defined corpus and concordances as collections of language that occurred in natural settings and were sorted based on explicit linguistic features, displayed as a sample of language used in varied contexts. Generally, many studies suggested using corpus for language learning due to its ability to provide learners with diverse and authentic English language uses by both native and non-native speakers (Birhan, 2021; Liou, 2019; Tsai, 2021; Wong, 2018; Yang et al., 2019; Yeh et al., 2007; Yoon, 2016). Corpus of Contemporary American English (COCA) was considered a concordance that provided considerable amounts of reliable examples regarding the sources. Its sophisticated search options and operators allowed users to elicit and verify phraseologies and grammar creatively.

With this access to language inputs and learning materials, these web-based tools could assist learners in developing their writing skills by increasing lexico-grammatical accuracy in compositions (Ebadi & Rahimi, 2017; Yoon, 2016). It was achieved through the references to typical and frequent patterns of a linguistic item extracted from language data that occurred in natural settings. In other words, referring to authentic data, such as words and sentences in actual language use, could make sentences composed more naturally and contextually accurate. Yeh et al. (2007) focused their study on the reference to synonyms using a bilingual collocation concordancer, TANGO, a Chinese-English concordancer. Learners could retain knowledge of word synonyms for an extended period using the concordance as manifested in the appropriate use in their writing over time.

Kvashnina and Sumtsova (2018) used Google as a readily available web corpus. The use could provide learners with hundreds of billions of words, and it was freely accessible with no special training needed. However, using Google as a web corpus must be made with caution because although it could provide many authentic texts, these language uses might only sometimes be essential and accurate regarding the language and speech standards. Some might be inaccurately used, negatively affecting the learners' writing development. Nevertheless, they concluded that Google searching allowed learners to evaluate accuracy and appropriateness using any language unit or patterns occurring in natural speech, eventually assisting learners in producing written work closer to native speakers. The samples provided through Google Corpus can raise learners' awareness of using words or language patterns in context while expanding their comprehension of the meaning of words, enabling them to use these words appropriately in their writing. Similarly, access to authentic learning materials was afforded when learners were tasked to work with WebQuest, thus enhancing the learning experience (Al Asadi, 2020; Dousti & Amirian, 2023).

The Low Anxiety Learning Environment

Some studies reporting on the use of web platforms such as Edmodo, Google Docs and in-house developed software, which were customised for specific needs of the learners, highlighted the conducive learning environment that these tools provided (Ebadi & Alizadeh, 2021; Ekmekci, 2017; Fathi et al., 2021; Hosseinpour et al., 2019; Karami et al., 2019; Ma'azi & Janfeshan, 2018; Miftah, 2018). These studies, for instance, discussed the safe environment in which learners could interact and complete writing tasks. Safe means that a social media platform was operated in a closed group-based channel, like Edmodo and some other customised in-house developed software, like AccurIT ESL (Grami, 2020) and Summary Writing-Pal (Chew et al., 2020). An instructor created a group that could only be accessed by selected members. Activities on this platform could be seen and participated in by these members, thus significantly limiting any uninvited interventions from external parties, such as malicious comments and irrelevant elements that could threaten the learners' learning process, creating a low-anxiety environment conducive to learning.

Abdallah and Mansour's (2015) study that made use of learning software, "Second Life", developed by Linden Lab, as cited in Schwienhorst (2002), claimed that the "virtual presence can result in reduced apprehension and embarrassment" (p. 153) in which the use of "Second Life" provided a relaxing environment for learners to complete writing tasks. Reducing learners' anxiety and apprehension facilitated language learning development and utilising a game-like web tool. Abdallah and Mansour reported the enhancement of learners' pragmatic writing skills, which included, among others, writing a curriculum vitae and formal business letters/emails. Lin (2019) asserted that "combining [certain] refined elements creates a relatively suitable and sensible way of using blogs for EFL purposes, thus helping in reducing learners' anxiety and increasing learner's writing development" (p. 8).

The Influence of Web-Based Tools on the Development of Different Types of Writing

The third research question attempted to analyse the elements of these web-based tools that could assist learners in enhancing their writing skills in different writing types. The selected studies reported various kinds of writing tasks which learners were required to complete, among others were descriptive essays (Yeh et al., 2007), research papers by postgraduate participants (Yoon, 2016), narrative essays (Yang et al., 2019), news writing (Wong, 2018), a combination of narrative, analysis, and comparison or contrast (Liou, 2019), and various written assignments such as essays and abstract writing (Birhan, 2021; Kvashnina & Sumtsova, 2018). What could be deduced from the findings of these studies is that using digital tools like Corpus and WebQuest as references helped learners improve performance in these different writing types by enriching vocabulary use and appropriate language patterns suitable for different writing contexts.

According to Ekmekci (2017), whose study required learners to write argumentative essays, the resources such as links to YouTube videos facilitated the development of learners' writing performance because these easily accessible inputs helped them enrich the content of the argumentative essay they were working on. Even though this was the deduction made by the author, data that were reported did not specifically illustrate the relation between this feature and each component of the essay rubric, which assessed learners in six dimensions, which were a) organisation and structure, b) relevance and content, c) lexical range/word choice, d) grammar/sentence structure, e) mechanics, and f) overall section which evaluated the whole paragraph.

Therefore, a definite claim could not be made about whether the assumption that the resources and inputs provided had specifically facilitated content or the language use of the essay production. Hosseinpour et al. (2019), on the other hand, were specific in reporting their findings by relating improvement in the five aspects of writing assessed on five essay types, which were classification, process, comparison-contrast, problem-solution, and cause-effect, of which it was revealed that Edmodo managed to assist learners to improve in aspects of organisation, vocabulary, and mechanics of writing. As an LMS, Edmodo provided learners various learning supports, such as comment sharing, to enhance collaborative writing. Library and Backpack were some of the functions that were useful to store learning resources and inputs, as well as varied types of testing functions that could assess learners' progress in groups or individually.

The studies that reported the integration of WebQuest to aid learners in developing writing skills highlighted the authenticity of tasks and the inputs provided to the learners via the reading required in completing the quest (Dousti & Amirian, 2023). Ebadi and Rahimi (2018) further related the improvement in writing to the high level of critical thinking ability that WebQuest afforded, and this was assumed to be facilitative in enhancing academic writing skills, focusing on opinion essays and descriptive writings that assessed learners in terms of task achievement, coherence and cohesion, lexical resource, and grammatical range and accuracy. The essay's topic was another trait that could be related to the writing type that learners were to produce. For example, Al Asadi (2020) required the participants to write persuasive and descriptive essays on intercultural topics. Findings indicated that WebQuest aided learners in significantly improving their writing style and intercultural awareness issues. These were manifested in clear topic sentences, linking sentences and appropriate details in the learners' written work for persuasive and descriptive essays.

CONCLUSION AND RECOMMENDATION

Findings of this SLR analysis studies that reported on using web-based tools in developing ESL and EFL learners' writing skills indicate that the most frequently integrated tools included social media platforms such as Facebook and collaborative authoring tools such as Blogs, Google Docs and Wikis. Other studies highlighted several in-house developed web-based apps to address learners' writing needs. The facilitative features of these technological tools mainly revolved

around interactivity, resourcefulness, and a low-anxiety learning environment, eventually leading to learners focusing on different aspects of the writing produced. Concerning the facilitative features enhancing different writing types, studies illustrated that learners made use of these technological supports to enhance vocabulary building, grammatical accuracy, organisation, writing mechanics, as well as critical thinking, contributing to the development of meaningful content in different types of essays, which included among others, opinion, argumentative, descriptive, narrative, news and research essays.

Among the selected studies for analysis, some reported insignificant results or even adverse effects of technology integration on the teaching and learning of writing. These can be due to varied factors, such as the efficacy of tools selection, learners and learning environment and technical challenges. That is why it is crucial for educators to efficiently select the appropriate tools for teaching and learning, whether they are for web-based modes or conventional face-to-face settings, to ensure that learning takes place effectively and that this effort yields benefits for the learners in enhancing their language proficiency, in general, and writing skills in particular.

Finally, it is recommended that future SLR or meta-analysis studies explore the effects technology tools have on different aspects of writing, conventionally classified into content and relevance, organisation, cohesion and coherence, vocabulary or lexical range, grammar and sentence structure, and writing mechanics. Systematic analysis of such studies may give insights to effectively select digital tools to optimise facilitating learners' enhancement of specific writing skills. Analysing correlational studies integrating technology in language learning by looking at the relationship between performance and motivation will provide detailed accounts of selecting digital tools to facilitate learners in both performance and affective realms.

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