A Review of the Computer-Assisted Language Learning (CALL) on Teaching and Learning Writing

Lai Van Du¹, Do Thi Ngoc Mai¹, Le Minh Trung¹*

¹ Dong Nai University of Technology, Dong Nai, Vietnam
* Corresponding author’s email: trungminhle.lmt@gmail.com

ABSTRACT

Computer-Assisted Language Learning (CALL) has been a heated topic for years as this theme consists of positive impact on pedagogy. In the field of teaching and learning writing, researchers with a wide range of studies figured that CALL provides both lecturers and students opportunities for enhancing self-confidence, fluency, and accuracy. Most scholars have indicated that the positive effects of CALL in writing appeared clearly. By reviewing sixteen articles related to the topic, the writers revealed the effectiveness of CALL in the context of teaching and learning writing both inside and outside the classroom. Additionally, the challenges of utilizing CALL for writing subjects are also provided a spotlight. The study also mentions the common similar limitations that reviewed articles comprise, hence, the suggestion for further research will follow.

Keywords:
CALL, writing, teaching and learning

Introduction

Learning is more and more easily accessible and convenient due to technology in general and computer in particular. With the drastic and rapid development of technology in the fields of producing computers that can be able to connect to the Internet, the connected computers have offered new tools that affect learners in terms of skills learning and practice as well as autonomy, interaction, and perception (Christenson et al., 2012). Indeed, when computers and other portable devices with similar functions like laptops or smartphones are connected to the Internet, they could be considered good supporters to learners in terms of reaching information, interacting, and correcting as a tutor according to Yamaguchi & Levy, (1999) at any corners. Moreover, teachers and learners have shown a positive attitude toward utilizing computers and other similar devices both inside and outside the classroom. With appropriate design and interesting display, soft-ware for teaching and learning have appeared in increasing over time, which proved the mentioned positive perception of lecturers and students. Therefore, due to a wide range of benefits, whether they are surficial or not, the technology application in learning and teaching languages has attracted a load of researchers and scholars to shed a light on taking advances and reducing drawbacks. Generally, the developing technology provides mentors and students opportunities with good support for bettering the pedagogy.

In greater detail of the big picture technology and pedagogy, computer-assisted language learning (CALL) appeared in the spotlight as a new and potentially positive method to learn writing, which has stimulated scholars and researchers to explore the double-edged side of this theme. In fact, for a long time, computers have been ubiquitous and convenient in learning

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because of the functions and design of the software in the machine that greatly support students with writing subjects. The soft-wares from the computers and the Internet offer students the appropriate solutions to writing problems such as spellchecker, grammar issues, and revision. More precisely, CALL has provided classroom and learners tools, the platform for studying with software, web application, and milieu. Additionally, applying CALL in language learning does not only help students and teachers in terms of skills but also the perception of learning from learners, which implied that this portion of combination pedagogy and developing technology is worth spending time investigating. Nonetheless, besides the positive impact that could not be put a doubt, the drawbacks of implementing CALL in teaching and learning languages remain a debate. Most researchers try to explore the CALL and figure out its effectiveness of it through a load of studies, yet the challenges of CALL applications also need revealing. Accordingly, the term CALL and writing continue to be a heated topic among researchers, which leads to further studies.

This present study aims to provide an overview of the effects of CALL on teaching and learning writing by reviewing six-teen representatively renowned articles. The prior mentioned articles are chosen from some journals such as the International Journal of English Language Education, Procedia - Social and Behavioral Sciences from Elsevier, or the European Journal of Social Sciences. Prior to the review of related studies, the authors mention the notion of Computer-Assisted Language Learning with the features as well as the brief history of CALL development. Via the previously reviewed studies, the writers indicate the effectiveness of CALL in terms of learners' attitude, fluency and accuracy; sequence, in addition, challenges of CALL in implementation in the teaching and learning process are also revealed. We, further, also shed a light on the few limitations of precede studies of CALL in teaching and learning writing. Furthermore, the suggestions for further research which appear after the discussion of all mentioned things above is mentioned as well.

**Literature reviews**

*Computer-Assisted Language Learning: the notion*

CALL is described as the search for and study of computer applications in language teaching and learning. The precise teaching and learning practices covered by this definition have evolved with computer technology to include the use of interactive CALL programs, linguistic and informational resources, and communication programs (Beatty et al., 2017), but the most telling aspect of the definition remains: the definition portrays CALL work as inquiry, which includes the activities of development, discovery, selection, and use. The term perfectly reflects the notion of forging new ground - a factor that is crucial to the contrast outlined between the demands of CALL assessment and those of material evaluation. The term “computer-assisted language learning” (CALL) refers to a wide range of technological applications for language learning, including CD-ROMs with interactive multimedia and other language exercises, electronic reference materials such as online dictionaries and grammar checkers, and electronic communication in the target language via email, blogs, and wikis (Chapelle, 2010). Language learners' usage of various technology has spread over the last several years throughout numerous language schools and beyond. This spread may be seen in two ways. One is the GEOGRAPHICAL (or horizontal) expansion of technology, which reaches so many language learners throughout the world. The other is the VERTICAL, which may be found throughout the language curriculum. The horizontal spread is an essential topic of study when social, political, and economic realities collide with learners' access to technology in different regions of the world (Yamaguchi & Levy, 1999).
**Brief history of CALL**

Computer-assisted language learning and teaching provide the language instructor and student with a variety of activities that, when correctly designed as part of lesson planning, allow language learners to get a deeper grasp of the language. The function of the computer in class as part of lesson creation has evolved through several phases and is now an integral element of the language learning process. Computer-assisted language learning (CALL) has evolved gradually, with three distinct phases: behavioristic CALL, communicative CALL, and integrative CALL.

The first phase was planned and realized in the second part of the twentieth century, and the computer was then used to transmit educational materials to pupils. The computer played the role of an instructor, delivering resources such as repeated language exercises, vocabulary, grammar, and translation exams.

The second phase of CALL emerged in the 1970s and 1980s, with the primary teaching style centered on communication. During this phase, several sorts of programs are developed and introduced. Several programs provided skill practice in a fashion where the primary goal was achieved by playing computer games. Even if the computer serves as an instructor in these applications, CALL is a technique used for activities involving communication and the use of a computer as a stimulus. This CALL activity's goal is to focus on the students' dialogue, written assignments, or critical thinking. Another computer communication model CALL refers to the computer as a tool; it is utilized in programs that help learners comprehend and apply the language more easily, such as spelling and grammar check tools used in the writing process.

The third and present phase is integrative CALL, which is based on the technical advancements of multimedia computers and the internet. Multimedia resources – texts, sound animations, and videos – are now all available for usage in a single system, which is often a computer. The Internet also delivers the most frequently used and accessed multimedia resources, via the World Wide Web, because it is the e-space where all multimedia resources are connected together and can be accessed with the click of a mouse.

**Related Studies**

For many years since its appearance, CALL has performed as the most powerful tool for teachers as well as students to enhance the quality of language teaching and learning. In fact, CALL has mentioned the framework of promoting the interaction between learners and teachers in writing subjects, on the other hand, the social discussion of teaching and learning is considered to be more active compared to the traditional class (Chapelle, 2010; Elola & Oskoz, 2010; Kessler et al., 2012; Shuhaida Binti Shukor & Noordin, 2014). Additionally, the other researchers (Dina & Ciornei, 2013) figured out that the convenience of CALL in the process of teaching and learning writing is the capability of easy access to the material and other information. Furthermore, the studies conducted by some scholars indicated that CALL greatly helps students to enhance the quality of the product generated in the context of CALL (Boulton, 2016; Parmaxi & Zaphiris, 2017; Li, 2018; Enayati & Gilakjani, 2020). Conversely, Musk (2016) implied that framework CALL influenced the process of teaching and learning writing. Moreover, in terms of the perception of students, researchers (Kung, 2018) figured that the CALL provided tools and themes for learners that they enjoy, which means students' attitude toward CALL is positive.

Chapelle (2010) wrote: “Early research on CALL was designed to show comparisons of learning outcomes from a control (classroom) group with those obtained from an experimental (CALL) group. Today the idea that research on CALL should deliver results allowing for
comparisons continue to be presented. Moreover, journals regularly publish studies comparing the outcomes from a CALL teaching unit (Allum 2002 as cited in Chapelle, 2010) or curriculum (Chenoweth & Murday 2003; Scida & Saury 2006 as cited in Chapelle, 2010) with a comparable one that does not incorporate computer technology. Researchers interpret results in terms of the particular programs investigated, but such research prompts researchers to attempt to extend beyond decisions about whether or not to use CALL to conclusions about the potential of technology for replacing some aspects of classroom instruction. The quantitative methodology for systematically combining the results obtained across studies is a meta-analysis. Grgurovic, Chapelle & Shelley (in preparation) conducted a meta-analysis of research on CALL from studies published from the early 1970s through 2006. Forty-two studies were identified as having a methodology for comparing CALL with a non-technology condition that allowed for their inclusion in a meta-analysis. (The original database of articles included is in Grgurovic 2007 as cited in Chapelle, 2010). Of those 42 studies, 14 found that the two groups were equivalent at the time of the pretest. These 14 studies produced a total of 32 effect sizes because of multiple tests given in some of the studies (e.g., assessment of both vocabulary and listening improvement). These 32 effect sizes produce a statistically significant difference in favor of the students using technology over those who had the classroom instruction alone. The three lessons prompted by work in CALL suggest directions for expanding perspectives from applied linguistics to the practice of materials development and evaluation. These are challenges for us in applied linguistics. We need to take the lead in moving materials evaluation into a more research-oriented framework, where legitimate claims are made about materials on the basis of evidence from research rather than solely from the creativity of marketing departments. Until applied linguists are prepared to offer concrete suggestions about feasible research that can be used in materials evaluation, we may need to be circumspect in criticizing publishers. In applied linguistics, one can find ample mention of villainous publishers whose profit motives preclude responsible development and evaluation of materials. My experience in working with publishers on materials development projects presents a different picture (Chapelle, 2010). The study is good for applying now because we get the outbreak Covid-19, so everyone cannot go to school for learning and teaching, but they can use CALL to learn online.

Additionally, the main purpose of the study implemented by Elola & Oskoz (2010) was to shed light on the question that whether the tools like wiki helped the students enhance writing work from the context of collaborative writing. With the drastic increase in technology resulting in the ubiquity of CALL, the authors had a desire to explore the approaches of learners when they were in the course of writing with the context of applying CALL in wikis. In addition, the author also investigated the "collaborative synchronous interactions" among the students and discussed a load of aspects of learning writing such as contents or ideas, the structure, and other elements contributing to the text. Moreover, the attitude of the participants was also implied by the researchers. The scholars, from the view of previous studies, stated that utilizing CALL in the context of writing class is that CALL is considered a tool to provide an environment for students that support the learners in order to enhance the products (Hirvela, 1999 as cited in Elola & Oskoz, 2010). The study was conducted at a university in the US with eight participants who majored in Spanish. The students who are all native English speakers had the experience of Spanish since they had had at least four courses in this language at the third-year level. In addition, the instructor is also experienced in teaching Spanish for years. The teacher provided the learners with social tools such as Wikis or Google docs in order that the students could overcome the difficulties of direct face-to-face discussion. Indeed, the tool greatly helps groups and pairs of learners to work in terms of interaction. Additionally, the class happened once a week with the duration of each session being two and half an hour. For each session, the students
were in charge of solving the grammar or structure problems regardless of the genre of writing the text. The students also had a discussion in class and then composed the text. For the study, the learners, with the support of Wikis or Google docs, uploaded the draft for assignment and received feedback or even organized online discussion for revision if needed. The data collected were various as it consisted of chat, essay, Wikis draft, and questionnaire. Findings from the study from the analyzed study presented that accuracy remained the concern of writing in groups. A similar phenomenon happened with the notion of writing complexity. Conversely, fluency did not appear with a difference when comparing the analyzed data between individually composing text and the group working students. The study also highlighted the positive impact of social tools like Wikis on the students that they interacted and approached as well as focused on the writing genres in greater detail when the students worked in a group. Even though the successful study revealed a positive view of the application of CALL in the context of collaborative writing, the small number of participants would be a concern. Moreover, the genre of writing was only concentrated the argumentative. In addition, the process of learning to write and compose the text of the study also affected the findings and results of the study. The two groups individual and collaborative, plus, were provided with a similar tool of social to interact, which leads to the big picture that the circumstance of being not separated from the experimental and control group.

Moreover, the studied web-based, project-orientated and multifarious collaborative writing is investigated by Kessler et al. (2012), for academic effects. In an orientation session at a big Midwestern University, 38 Fulbright students used a web-based word processing tool to organize and report jointly on research projects. The objective of this research is to examine and understand how web-based writing settings are impacted by the changing nature of collaborative writing. Details of the writing processes of the students and their impressions of the web processing experience of collaboration are discussed. The findings show that students were more concerned with meaning than form, that their grammar modifications overall were more accurate than wrong, engaged in different frequencies, and utilized this tool in different ways. Further insights are provided through student feedback on the web-based collaborative work and utilization of Google docs. Comments on the developing nature of collaborative web-based writing and accompanying educational approaches including student autonomy issues are explored. This study has demonstrated that highly competent, non-native English speakers, who participated in a collaborative project by utilizing Web-based word processing tools, concentrated on meaning over form as their texts were generated. Students also cooperated well in groups and created their own writing processes. Survey data showed students appreciating many parts of collaborative writing on the Web, and feeling that they had worked well together and that each individual participant is playing a major role. They also believed that they respected their efforts and appreciated their individual members’ contributions. The student involvement observation through collaborative autonomous language learning enabled us to observe how students connect with other people in a variety of ways. In the context of these developing collaborative technologies, such techniques have just lately become available. The co-evolution of web-based word processing and the increasing ability of the students to use such tools is therefore essential. In order to discover methods to promote flexible pedagogical practices, it is also necessary to think about the link between the development of the usage of such instruments, the instruments themselves, and associated pedagogy. Such educational reflection would provide advice for a greater readiness to maximize their potential and enable students to determine their own usage of their surroundings to a certain extent. The technological co-evolution, the pedagogy, and the connecting links of the two generate new settings and experiences for writing. It restricts the possibility of this co-evolution by using the new technology of collaborative writing without adjusting educational writing. The
development of autonomous collaborative language learning skills in writing initiatives enables students to prepare for new and unexpected possibilities for writing. Although we don't suppose we are aware of the evolution of these technologies or pedagogies, it is vital to realize that change is under place and that instructors and students may and should be involved.

In addition, the effect of computer-assisted language learning on the EFL high school students writing achievement was proved in the study conducted by Jafarian et al. (2012). Forty participants of out forty-seven candidates from a high school in Iran were divided into two groups control and experimental group as seven students did not meet the requirement of language proficiency whilst the chosen were intermediated via the pre-test entrance permission. Both two groups took part in an advanced writing course which lasted one and half an hour each week. The participants who were accepted to the course had acquainted with the computer adequately to enter the course with numerous skills. The two instructors for the T-test were English masters and well-trained. Indeed, they were tested with proficiency and then responsible for control groups and experimental groups, which means each group consisted of ten students and each lecturer took one control and one experiment. Both groups were trained with a similar material named Communication through Writing” edited by Margaret Pogemiller Coffey (1987) (as cited in Jafarian et al., 2012). Both groups of control and experiment were trained with the traditional materials and required to compose the free text for submission in the sequence session. The students from both groups of four classes, plus, received feedback from the instructors during 15 sessions. Nonetheless, the two experimental classes were provided with the support of CALL material so-called WordPerfect as well as MS office 2003 and Professional. The software supported the students with feedback while the students were typing. Additionally, the Oxford Learners dictionary was also attached to the software. Accordingly, the writers in experimental classes received feedback on a load of aspects of writing such as grammar and spelling in form of an underline of text. Based on the cues provided by the software, the learners could find a suggestion for correcting the mistakes. The researchers collected 15 papers for analyzing the differences between the two groups with the first for the pretest and the last work for the post-test. In addition, two questionnaires were also designed the first one with a 5-point Likert scale of sixteen items for the control group and the second questionnaire with a similar scale to the prior one of eighteen items. The findings from the study provided a spotlight on the positive impact of CALL on the knowledge and competency of participants in experimental classes, which leads to a significant difference between the two groups of joiners. As mentioned above, the study advocated that CALL affects positively the writing learners' achievement in terms of knowledge and competence. Nevertheless, the study proved that computer utilization did not create a major impact on final writing achievement. In addition, the study also did not investigate the perception of learners and the factors of instructors, that the instructors should have left the learners to generate the text by themselves rather than attend completely the class and provide support any time the students needed. Moreover, the study should have chosen participants more carefully not randomly, and rejected the other factors coming from the procedure that could affect the results of the study.

Dina & Ciornei (2013), furthermore, aimed to indicate the benefits and challenges of CALL by reviewing studies of other researchers in order to shed a light in the application of CALL in both teaching and learning foreign languages. Initially, the study discussed the brief history of CALL over time with the advantages and disadvantages of each phase which include "behavioristic CALL, communicative CALL, and integrative CALL"(Dina & Ciornei, 2013). In fact, the advantages, which appeared to be dominant on the contrary side were figured language material accessibility, "grammar checks programs used in the process of writing"
according to Dina & Ciornei (2013). In sequence, the authors argued the advantages and disadvantages of CALL in the real application process. Indeed, the writers mentioned the positive aspects of CALL as the positive tool for developing interaction among students and teachers which is supposed to appear clearly in collaborative writing, and classroom management; meanwhile, the CALL, at the same time, was viewed as a model to help students with evaluation and creativity which links directly to language output skills like writing. The study, plus, argued that the teachers have to be familiar with the "language" of computers, which means that the mentors should be trained in the use of the computers as well as the appropriate programs, and the teachers are believed to have the capability to get acquainted with the Internet connection and applications whilst they are able to make up the exercises on mentioned framework together with basic applications that serve pedagogy. In addition, the researchers, simultaneously, advocated that the CALL still belongs to the junior age rather than the senior one as the learners are "step ahead" of the drastically developing of computer science and technology. Nonetheless, the prior mentioned phenomena could be considered bilaterally positive and negative since this could be turned into advantages in teaching languages unless the teachers have an appropriate lens to view the issue. Internet use was, as well, mentioned positive component of CALL in the classroom in general and the learning process in particular. Moreover, the author concluded that the role of teachers in the process of learning which is related to CALL is significant due to the guidance, adjustment, and creativity. Generally, the study highlighted the advantages of CALL to language learning including learning writing through the phases of development while the advantages and disadvantages of CALL in implementation in pedagogy were also discussed. Therefore, from the perspective of the writers, CALL was shown to have positive effects on language learning when it is in the right application, which means the learning process of any aspect of language like writing can be positively affected by utilizing CALL. The study should have been more perfect if the researchers conducted a study to firm the suggested advantages and disadvantages of CALL in real application with the appropriate context, scope, and methodology. In addition, the research stated the main points of the big picture of CALL, which leads to the circumstance of being too general and not certain due to the shortage of firm proof, at least with previous studies.

Besides, Zaini & Mazdayasna (2014) conducted research on the influence of Computer Assisted Language Learning (CALL) on the development of writing abilities in EFL learners. Forty-four Iranian students majoring in English as a foreign language were chosen and randomly allocated to one of two groups: control or experimental. The control group proceeded with typical writing assignments, which included direct grammar teaching and comments on writing tasks from the teacher as the only examiner. Students in the experimental group, on the other hand, were exposed to computer-based education, and their writing session was held in the Computer Laboratory. The current study used a quasi-experimental research approach with a pre-test, and post-test control group design. At the start of the semester, both groups took a pre-test. The post-test (pen-and-paper writing) findings indicated that students in the experimental group excelled over their peers in terms of utilizing suitable articles and tenses. The findings indicate that by writing on screens and using Microsoft Word Office as a word processor, students in the experimental group gradually improved their writing skills and increased their ability to use more appropriate structures, develop their ideas in an organized manner, and produce more qualified texts.

Similarly, Shuhaida binti Shukor & Noordin (2014) conducted to study with 33 second-year ESL undergraduates (9 males and 24 females) at Putra University in Malaysia about the effects of Facebook collaborative writing, based on the student's number above the author divided them became two groups: the first group is treatment group with 4 males and 12 females, the
second group is comparison group with 5 males and 12 females, then using the systematic random sampling based on the pre-test result, after that, the author had arranged the pre-test results in descending order and paired the highest scores with the lowest scores. This was to determine the collaborative writing groups for both comparison and treatment groups. For the comparison group, the participants were required to do the writing tasks via the face-to-face method. Meanwhile, in the treatment group, the participants were required to join Facebook groups created by the author called 'Pour Your Thoughts 1 – Pour Your Thoughts 4'. Before going through different treatments, the participants were taught by the author in two meetings and the rest of the writing activities were conducted for six consecutive weeks. Prior to the treatment, the participants were given a pre-test and post-test of argumentative essays taken from the Educational Testing Service (ETS) question's bank and an analytic rubric. The result showed that the scores of participants in Facebook collaborative writing groups were slightly higher compared to face-to-face collaborative writing groups. It can be said that students' writing performance was improved with the use of Facebook in collaborative writing. With Facebook, a more meaningful learning environment can be created and the comment feature makes the learning process more easy and more fun. Facebook also allows students to discuss with peers, give feedback, and comment on the writing activities either a uniform or none uniform. Therefore, these findings may be beneficial for stakeholders, educators, or writing instructors to utilize collaborative writing on Facebook especially to harness writing skills and change students' perceptions that Facebook is actually appropriate to be medium for English learning. Besides, this study also is hoped to make them see the connection between the meaningful communicative use outside of the classroom and writing activities that were conducted in a formal setting like classroom context. The study is useful for those who are teaching ESL and learning students, the process can apply to themselves.

Further, Boulton (2016) conducted 12 meta-analyses to show the size of the effect of CALL use in experimental groups compared to control or comparison groups. The first three give large effect sizes according to Plonsky and Oswald's (2014) empirically-derived, field-specific benchmarks based on meta-analyses in Second Language Acquisition (SLA) (d ≥ .9); the next two are medium (d ≥ .6), followed by three small (d ≥ .4) and four negligible effects (d < .4). The mean is .64, the pessimistic conclusion being that CALL work as a whole has barely a medium effect on learning. However, what we would hope to find is that CALL is at least as good as traditional teaching, with an effect size of d=0 (or, according to Hattie, 2009, d=.4), which is the case here. Since most primary studies are relatively focused and short-term, they will not show other benefits which we may want to impute to CALL. These might include cost or time efficiency, motivation or enjoyment, long-term retention or appropriation, learning-to-learn or becoming ‘better language learners’, increased autonomy or transferable skills, etc… also the samples are very less.
field of CALL: (a) compilation of the Web 2.0 corpus, which included research manuscripts related to Web 2.0 research from January 2009 to December 2013 from four major journals devoted to CALL; (b) refinement of the Web 2.0 corpus; and (c) synthesis of the research. This research identified the opportunities and problems that Web 2.0 technologies present in language courses. Web 2.0 tools can help with a variety of abilities, including collaborative learning, self-directed learning, and intercultural awareness. The requirement to integrate task design, instructional goals, and educational methods with the technical affordances of Web 2.0 technologies is the most significant difficulty addressed. Furthermore, there is a need to extend our understanding of the relationship between new technology and the practices and literacies of instructors and students. Furthermore, there is a need to improve both learners' and instructors' multi-literacy and multimodal competency for coping with learning in social settings. Ito et al. (2008, p. 2) state that learners' engagement in the linked world “suggests new ways of thinking about the function of education.” Web 2.0, like many other developing technologies, is trialed on a small scale to investigate its affordances in and out of language schools. However, kids who properly explore the possibilities of these technologies may find it simpler to navigate through new technologies from an early age. The successful use of evolving technologies is dependent on sustaining relationships with our changing learners and providing chances for experimentation and new discoveries.

Likewise, Musk (2016) conducted a study with four pairs of pupils at the age of 17 from two classes in year 10 of Swedish upper secondary school in order to investigate how learners studying foreign languages do correction of spelling mistakes which is a contributing factor of writing accuracy (Zaki & Md Yunus, 2015) whilst they are doing collaborative writing under the context of CALL support. The scholar focused on the process of writing, which was distinct from other studies concentrating on the output. The mentioned process which means the process of generating the writing by students who had received same instruction for the study with some applications like Microsoft Word or Microsoft Powerpoint and the students made mistake then self-corrected misspelling words without support from spelling checkers or other pupils was observed by two cameras; one used to zoom to the screen of the computer and one from the side to catch the action of each pair. After collecting the data from recorded videos and analyzing the materials by the theories of repair and correction, which had been studied by other researchers, the study argued that the initial perception of spelling mistakes of students mainly comprises three aspects of the current typing learners, the software and the other student (Musk, 2016). In addition, the study figured out the theory of "self-initiated self-correction". According to the analysis and results of the study, the author indicated that most of the mistakes were corrected by the mistakes maker, which means the typist self-regulated the output simultaneously with the process of composing the text. Additionally, the co-writers and the software of the process generating the work also contributed to the appearance of initial perception of misspelling mistakes. In another hand, the study highlighted the "typing flow" without any support from the checker plugin of the text generating software as well as the fact that "triadic ecology" together with time had an impact on "the structural preferences of self-correction" (Musk, 2016). In terms of the big picture, the study succeeded in having provided the phenomena of self-correction of writers whilst being in the process of composing text under the context of collaborative writing with CALL, which method was contradict other previous studies that had focused only on the products of learners. Nevertheless, the study focused only on the students writing process without any words about the level of proficiency of language standards. Moreover, the study collected the data within quite a small scope due to the small number of participants. Accordingly, the study required further research with an appropriate scale of the context of utilizing CALL in combination with collaborative writing and participants.
In another development, elsewhere Li (2018) had the desire to explore the effects of CALL generally and web 2.0, particularly collaborative writing. The author holistically analyzed 21 renowned articles in the period of 2008 and 2017 from "top-tier" journals. Actually, the writer utilized the web page Google scholar to search the keywords related to CALL, second language learning, and collaborative writing with the web 2.0 tool. Therefore, twenty-one articles were selected from some reputable journals over the world. After analyzing and reviewing all the representative work, the writer began the study with a brief definition of collaborative writing with the theory of Ede and Lunsford (1990, as cited in Li, 2018) and Storch, (2012) as well as Storch & Aldosari, (2013). Of all, the notion of Storch appeared the most comprehensive "participants work together and interact throughout the writing process, contributing to the planning, generation of ideas, deliberations about the text structure, editing and revision". Moreover, the writer mentioned the web 2.0 tool such as Google Docs and wiki as pedagogy support for the whole writing process from the pre-writing to the post-writing stage. The study emphasized the computer-mediated collaborative writing in the L2 context and that some components of previous studies which included the context and technology, theoretical or pedagogy framework, writing tasks as well as the data and research instruments were shed a light on. Additionally, the scholar also provided a spotlight on the main themes of prior research which were interaction and writing process, writing products, and students' perceptions. In general, the first theme was viewed into four categories revision behaviors, online discussion, the pattern of interaction, and interaction explanation factors. Whereas the writing quality contains accuracy, fluency, and other aspects, the correlation between writing processes and products together with individual writing contributed to the second theme. Lastly, the third theme consisted of the perception of benefits, challenges, and group interaction. The literature review coming from Li argued that the CALL despite a few limitations remarkably influents the students' writing products in terms of accuracy, complexity, fluency, and some other aspects, as well as this kind of pedagogy platform, provided a good impact on the students in the field of interaction together with the awareness of using CALL tool. By reviewing the previous studies by a holistic approach, the author, based on the Zone of Proximal Development (ZPD) theory of Vygotsky (1978, as cited in Li, 2018) in combination with the notion of collaborative writing, figured out that the computer-mediated collaborative writing in the context of L2 greatly comprises a load of advantages which are dominant the disadvantages. In addition, the researcher also stated the limitations of the study in some fields that came from the genres of articles from a certain journal not to mention the publication of the conference. Moreover, the study scope focused on the L2 of learning English, which raised the question of whether CALL would have effectiveness in the application of other languages' collaborative writing. Another point of limitation was that the type of different technologies could be able to facilitate the results of the study conducted by scholars whilst the previous studies concentrated on web 2.0 tools only. Accordingly, Li suggested recommendations for both teachers and students in order to take advance of CALL better. Generally, the study mentioned the advantages and challenges of computer-mediated collaborative writing by reviewing some related studies. Although the advantages overwhelmed the obstacles, there still be some questions that need responding which require further research. All things considered, the study shed a light on mentioned abovementioned points with clear holistic subordinated evidence. Nevertheless, the study, conversely, still included the debate of being lack of a broad perspective on other languages rather than English. Further, other material besides prior journal articles should have been viewed.

Kung (2018), in addition, investigated the perceptions of highly proficient level English learners together with motivation as well as confidence and strength and weakness through the process of learning academic writing under the context of blog-assisted language learning.
(BALL). This tool was created by the development of a web 2.0 platform which is an application of computer-assisted language learning (CALL) according to Trajtemberg & Yiakoumetti (2011) (as cited in Kung, 2018). Accordingly, the BALL in the context of learning writing was shown as a tool to promote the interaction both inside and outside the classroom from the view of Kung due to various elements that could be displayed in a blog on the platform of web such as text, video, and audio. The author, in order to prove the mentioned hypothesis, collected data from a university in New York, the United States for a course of academic writing lasting for a semester. Thirty-four students from an intact class, who had met the standard of the study based on the theory of some researchers (Rubin,1975; Patton,1990; Burgess,2005, as cited in Kung, 2018) took part in the course. Moreover, the proficiency and confidence of the participants were measured by the institution and CEFR C1 before being in the course. Major and demographic features of candidates of the study varied in fields and regions. In the initial week, the participants were introduced to using the computers, which were in the lab of the academic institution and they would use them for all sessions during the semester of the course. Then, the journals and assignments for the final were uploaded to the participant's blog each week. Reading and writing samples provided by the blog tutor page were required with the students. Additionally, the enrollers were asked to maintain their blogs, they had to, as well, participated in the discussion mandated by the school. Sequence, the writers, based on the feedback from peers revise their draft. After the course, the questionnaire and semi-structured interview were implemented to explore the attitude of students toward the utilization of a tool of CALL. The author, through the analyzed data and the result of the post-test interview combined with the questionnaire, indicated that the motivation and confidence of learners did not develop even though the students advocated that the BALL had a positive impact on students, which means a positive attitude. The researcher also argued the advantages and disadvantages of BALL and suggested that "program directors and teachers are advised to be cognizant of the potential ramifications that might adversely influence students' learning trajectory" (Kung, 2018). All considered, the study implied the positive attitude of learners towards an application of CALL although the hypothesis of bettering motivation and confidence of learners failed to be proved. The results of the study were relatively affected by some factors of learning like time management, which was suggested to be more attended by the author. The study mentioned the benefits of applying CALL in learning writing, nevertheless, the drawbacks were also mentioned in combination with the contradicting findings in terms of learners' motivation and confidence compared with previous studies, which resulted in the question that whether the theme of utilizing CALL needs further research in greater details of the context of writing learning and other aspects such as scope and lecturers' attitude.

Tafazoli et al. (2019) focused this research on the historical progress of technology in Computer-Assisted Language Learning (CALL). The study began with defining CALL and its related vocabulary, then moved on to other decades of mainframes and microcomputers, covering the earliest CALL efforts in the 1950s and 1960s. The final stage would be a study of developing technologies in the twenty-first century. Without a question, information and communication technologies (ICT) have an influence on how languages are taught and learned. It is now possible to say that Computer-Assisted Language Learning (CALL) is a middle-aged interdisciplinary discipline with a wealth of expertise from throughout the world (Warschauer, 2013). With the progress, it is possible to say that CALL has achieved a point of stability in language education; moreover, the use of language education software and apps has become a common social phenomenon. However, in order to properly design and integrate technology in language education programs, teachers and students must first define their objectives. Furthermore, all complications and challenges, such as cultural, institutional, and
infrastructural, of integrating education into the syllabus should be considered (Warschauer & Whittaker, 1997). Finally, we would want to caution both language instructors and students against the ‘dual face of technology’ (Saeedi, 2013). CALL, as pedagogical phenomenon, has both advantages and disadvantages. Language instructors and students alike should avoid ‘techno-centrism.’ "When we talk about computers in education, we should not think of a machine having an effect," writes Papert (1987). We should be discussing the opportunity that has been presented to us" (p. 22).

The current study, conducted by Enayati & Gilakjani, (2020), aimed to investigate the influence of CALL on the vocabulary learning of Iranian intermediate learners. The Tell Me More (TEM) program was employed by the researchers to achieve this goal. The Preliminary English Test (PET) was utilized as a standardized test in this study to determine the individuals’ level of language competence. The researchers then divided the individuals into two groups: experimental and control. The experimental group consisted of 31 EFL students, whereas the control group consisted of 30 EFL students. A pre-test of 80 items was given to the participants to assess their prior knowledge of English in terms of vocabulary. The students in both groups were taught for 12 sessions by the researchers. The TEM program was utilized as a therapy in the experimental group, whereas no treatment was given to the control group. Both groups were taught identical terms. After 12 sessions, 65 items were tested to compare the outcomes of the two sessions and determine the success of the treatment. The data were examined by the independent t-test sample. The post-test findings demonstrated that experimental group members exceeded the control group and had favorable views about CALL. For EFL teachers, EFL students, and designers, the results of this study might be of value.

Additionally, a meta-analysis was done by Saad Mohamed (2020) to synthesize years of research on feedback in CALL studies and finding feedback moderators in CALL. The investigator identified 21 main studies that fulfilled the inclusion and exclusion criteria by creating stringent inclusion and exclusion criteria. The results showed that feedback in CALL had a substantial medium impact size on student language learning outcomes ($g = 0.56$), according to the Random-Effects (RE) model. The findings also revealed that the influence of feedback is regulated by a variety of factors, such as the learners' mother tongue, intervention provider (i.e., teacher, researcher), target language, and so on. The study found that CALL feedback is a potential sector for language acquisition, with implications for instructors and future research. A meta-analysis was carried out to get a better understanding of the overall effect of feedback in CALL on language acquisition and its moderators. A meta-analysis is a statistical approach to combining the findings of several independent experimental investigations (Borenstein, Hedges, Higgins, & Rothstein, 2005; Borenstein, Hedges, Higgins, & Rothstein 2009; Lipsey & Wilson, 2001). To gather and analyze studies, the investigator used meta-analysis techniques. These methods included the following steps: (a) a thorough search to find possible target studies; (b) coding study features (moderator variables); and (c) statistical analysis to compute the total effect of feedback and identify the effects of prospective moderators. The current study statistically integrated the findings of 21 studies involving 1313 students on the overall influence of feedback in CALL on student learning outcomes. The findings of this study are consistent with earlier meta-analyses in the area (e.g., Azevedo & Bernard, 1995; Kang & Han 2015; Li, 2010) showing feedback in CALL has a substantial moderate and favorable influence on language acquisition. Furthermore, the study looked at the elements that moderate the effect of feedback in CALL. Among the thirteen moderator factors examined, educational level, intervention provider, mother tongue, research environment, topic domain, and target language all had a substantial influence on the overall effect of feedback. However, intervention time, intervention modeling, intervention status, language competence,
proficiency assessments, publication style, and study setting had no influence on feedback in CALL.

Recently, Bahari, (2021) focused on a survey of 286 peer-reviewed publications published between 2002 and 2018 to identify the dominant assessment techniques and strategies used for language competence assessment in computer-assisted language learning research. Given the variety of instruments and tactics used for assessment, it was important to follow the research trail in order to forecast future assessment trends based on reported discrepancies and suggestions. According to the findings, assessment methods and tactics that address the dynamicity and nonlinearity of individual-test-taker differences through adaptive, interactive, and dynamic approaches are on the increase. The investigation uncovered reports that had gone unnoticed for two decades, demonstrating the irregularity and inadequacy of using pencil-and-paper duplicates for computer-assisted evaluation reasons. Based on the findings, it is possible to forecast that computer-assisted assessment would shift toward integrated skills assessment and nonlinear dynamic individual-learner-centered assessment. Outlining mainstream assessment tools and strategies, as well as forecasting the future direction of language proficiency assessment studies, have significant pedagogical, theoretical, and assessment implications for CALL studies in particular, and the broader field of language acquisition in general. According to the findings, Web 2.0 assessment tools were the most commonly used computer-assisted assessment methods in studies done between 2002 and 2018. As a result, methods that cater to the dynamicity and nonlinearity of individual-test-taker variations (i.e. adaptive, interactive, and dynamic strategies) were the most often used strategies for measuring language competence worldwide. This study reemphasizes reports that have gone unnoticed for two decades about the irregularity and inadequacy of using pencil-and-paper duplicates for computer-assisted evaluation purposes. Another shortcoming identified by the study was the need to build integrated skills evaluation tools and affordances by enlisting the most recent technological advances. Based on the research examined, it is possible to expect that computer-assisted assessment studies would shift toward nonlinear dynamic individual-learner-centered assessment by embracing interactive, dynamic, and adaptive methods.

In conclusion, the researchers conducted studies to indicate the advantages and disadvantages of implementing CALL in language study and language teaching. Precisely, the mentioned researchers mainly suggested the positive effects of CALL on teaching and learning writing in terms of both skills components and perception. Fluency and accuracy of the text products generated by the students; the social interaction feature as well as information excessive ability of CALL, learners' autonomy and positive attitude of learners under the context of utilizing CALL in writing were shed a light on.

The effects and challenges of CALL on teaching and learning writing

The effects of CALL on teaching and learning language

CALL offers several benefits for language study and instruction. It is also regarded as a highly important tool since it helps pupils to connect with the outside world, therefore creating an authentic learning environment. It is a highly useful tool since talents can be readily merged and organically integrated into a single task. It is also a strong tool since it offers students control over their learning while also individualizing their requirements and fostering learner independence and the development of learning methods. It is a motivational tool since it provides access to a variety of amusing games and communication activities, decreasing learning tension and anxiety by providing repeated lessons as needed. It is an interactive tool since it allows students to develop their own materials and share them with other students, as well as converse with native speakers for greater understanding and more precise meaning.
representation. It is a useful tool since it provides students with continual access to a wealth of resources, such as newspaper and magazine articles, movie reviews, and book excerpts. This is an educational tool, because it offers students an opportunity, as part of cultural and social exchange and improving reading and writing skills, to actively participate in activities beyond classes and course books in the target language, to exchange messages with mother tongues, and to interact in their target language. It is a tool of trust because the Internet is text-driven, offering time and place for people who are even most timid or hesitant to think and share information. Through communication and interaction, students can improve their linguistic skills, and change their attitude to learn by building self-confidence.

CALL The provision of the same language material where necessary; enabling students to access repeated materials and providing immediate and un-judgmental feedback every time is ideal to master the language; presenting these materials individually, without time limitations or time periods and offering students the option. The provision of language material is also essential for language acquisition.

CALL is useful for foreign language teachers. The recommendations mainly pertain to the establishment of excellent interactions between instructor and student during foreign-language classes, on the basis of what is new creative, and irreplaceable in a new vehicle that promotes lessons of quality and relevance. Here, if the computer can provide students with knowledge, practice, and activities a book or other educational support is not possible, it should be seen as a valuable instrument.

If a favorable educational outcome is obtained by enabling the professors to incorporate computers into their lessons, motivate students to become more active in their lectures, aid them and assist them in internet activities, the computer should be regarded as a good option.

The challenges of CALL on teaching and learning writing

One of the biggest problems for both educationists and CALL proponents was overcoming the barriers of linguistic learning and optimizing their chances of finding new ways that could contribute to technology integration into language learning. They had received the premises they needed to take the following steps from the recent growth and breakthroughs of computer technology.

In the face of certain major impediments arising from some external factors, all of these benefits are lost. The primary concerns seem to be financial and technological issues. Financial issues are connected to computer, software, line, and other expenditure purchase charges. Technical issues include that computers are unable to deal with unforeseen events as teachers can owing to the limits of their artificial intelligence. Other difficulties may be that both instructors and pupils require training to gain fundamental ICT skills that enable them to operate the computer. Otherwise, pupils could be dissatisfied and not motivated and teachers could reject to utilize the technology they could not grasp. There may be a lack of concentration and hesitancy with regard to the choice of the materials in various but still enormous numbers of information on the Internet. The fact that the largest portion of the effectiveness of using CALL in the classroom as part of lesson planning rests solely on the instructors' utilization of Internet resources is another drawback.

Certainly, there are a lot of good characteristics that have to be balanced against the unfavorable aspects of how technology should be implemented. On the one hand, computers can quickly offer access to a certain piece of information but, without a doubt, teachers who are looking for a certain section of it will spend more time. On the other hand, teachers in courses are extremely
critical since they offer a number of important examples in order to better understand a certain subject and change their speed and rhythm according to unique student demands.

While computers are part of the learning process, helping the students with information, teachers can offer valuable feedback and always provide their students with good information, instruct them to choose properly and genuinely on the Internet, and to be creative. The role of the teacher in the classroom is very important. Computers are wonderful tools for the learning process, and the Internet is very useful in language acquisition and education, but the human aspect is the most significant component; it is the teacher, whose role is crucial in moral advice, mentorship, professional and social growth and the promotion of intellectual advancement. In summary, although computer systems cannot and should never be able to replace teachers for the above reasons, and although computer-assisted language learning and teaching benefits in classrooms, development technologies must only be seen as part of a daring effort to develop a successful education system. In addition, computer technology should be integrated into learning and teaching.

**Previous studies’ limitations**

Although the prior mentioned studies succeeded in proving the undoubtable advantages of CALL in the context of teaching and learning writing. Some limitations could be seen in the previous articles. These limitations could have impacted the results of the studies, therefore, they are now viewed in order to further concern future studies.

Firstly, most of the articles which were reviewed concentrated on the text products composed by the learners. This phenomenon took place as the researchers only focused on the quality of the writing after applying CALL for a certain period of time, usually the course of university. The studies mainly highlighted the quality of the work in terms of fluency or accuracy like grammar (Boulton, 2016; Parmaxi & Zaphiris, 2017; Li, 2018; Enayati & Gilakjani, 2020). Nonetheless, the process of teaching and learning writing under the context of CALL still needs investigating as few researchers shed a light on this phase (Musk, 2016). In reality, the process of learning writing comprises a load of variants that affect the writing process; hence, the process of learning including the process of composing writing text needs concerning.

Additionally, from the articles, the language that is related to the studies, which means the context of applying CALL in these studies is English or the native language of the participant is English. Very few researchers highlighted the other language (Li, 2018) in the studies and language of non-native English speakers (Enayati & Gilakjani, 2020). The ubiquity of applying CALL in the context of teaching and learning writing just only in English results in the fact that the circumstance raises a question about the potential impact of CALL on language (differs from English) study and teaching.

Furthermore, the attitude of the instructor toward the application of CALL in teaching and learning writing is also unrevealed. Although the reviewed studies successfully indicated the positive effects of CALL on teaching and learning writing in terms of learners’ product quality together with learners’ autonomy as prior mentioned studies, the instructors’ attitude toward utilizing CALL for writing subjects remains unlighted. Precisely, teachers or instructors play a fundamental as a guide to new methods of teaching that learner-centered approach according to Esplami-Rasekh & Valizadeh (2004). Meanwhile, the researchers seemed to forget to take concern about the lecturers’ perception of CALL in the context of writing. The process of teaching and learning comprises mainly of the learners (in the new perspective of pedagogy), which does not ignore the significant support and guidance coming from the teachers, which the reviewed studies ignore.

Ultimately, the reviewed studies suggested the positive effects and some challenges of utilizing CALL in teaching and learning writing. Despite the fact that the mentioned success was proved,
Conclusion
Overall, this study focuses on the effects of CALL on teaching and learning writing by reviewing some related studies from well-known journals of top-bar publishers. Indeed, analysis and comparison among studies indicate that CALL does not only provide a framework together an environment for both learners and teachers but also offers applications for enhancing the quality of the work composed by the learners. In addition, the interaction between learners with peers and teachers was stated to have been promoted. Moreover, the positive attitude of learners was also indicated through the studies conducted by other researchers. Additionally, the learners' autonomy is also mentioned to be positively affected by the context of teaching and learning writing with CALL. Due to the results of scholars, we conclude that CALL gives a positive impact to the process of the learning and teaching process. Nonetheless, the limitations of the studies show that further research on the process of composing the text, teachers' perceptions, and language subject (which differs from English) should be conducted to provide a broader overview for revealing the big picture behind the circumstance.

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**Biodata**

Lai Van Du, Dong Nai Technology University, is working as an engineering manager at Long Binh Branch of Olam Viet Nam LTD. Du has been working with foreign companies for over ten years. Du is interested in researching the English learning process. Du has Master degree in English studies.

Do Thi Ngoc Mai, Dong Nai Technology University, is working as a staff in the International Affair Office at Dong Nai Technology University and an English teacher simultaneously, Mai
is interested in researching the English learning process of young age learners. Mai has Master degree in English studies.

Trung M. Le holds a Master's degree in English studies from the Dong Nai University of Technology. He has given classes on English skills for various ages from children to adults for ten years. The topic of utilizing technology in instructing languages interests him particularly.