International Academic Conference on Teaching, Learning and Education
T L E C O N F

Athens, Greece
21- 23 October 2022

5th International Academic Conference
on Teaching, Learning and Education

Perceptions of Computer-Mediated Feedback in English as a Second /Foreign Language Writing: A Review Study from 2010 to 2020

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Abstract

This study conducted a review of 34 studies regarding perceptions of computer-mediated peer feedback (CMPF) and computer-mediated automated feedback (CMAF) in English as a Second/Foreign Language (ESL/EFL) writing. The studies under review were searched with a comprehensive set of keywords and selected from the Web of Science database. All of them were empirical studies published on top academic journals between 2010 and 2020. By synthesizing the selected studies, the author summarized the perceptions to CMPF and CMAF and discussed the potential reasons behind the perceptions. The major findings are: (1) towards the CMPF on ESL/EFL writing, learners' positive perceptions are resulted from technology advancement while negative perceptions are generally caused by different language proficiencies among the peers; (2) toward the CMAF on ESL/EFL writing, the convenience brought by automatic programs are the foundations of learners' positive perceptions, and the negative perceptions are caused by the insufficient resources and inappropriate designation of the programs; (3) when compared between each other, CMAF is less favorable than CMPF, and both of them are considered less valuable than teachers' feedback. Moreover, there was a research gap on instructors' perceptions of CMPF and CMAF that needed to be filled. Based on these findings, the suggestions for eliminating the negative perceptions and improving the effects of computer-mediated feedback in ESL/EFL writing were proposed.

Keywords: Computer-Mediated Language Learning, ESL/EFL writing, feedback， perception

1. Introduction

With the wide-spread use of computer-mediated tools in the English as a second/foreign language (ESL/EFL) writing classes, many previous studies focused on the unique effects brought by the participation of computer as a platform. After reviewing previous literature chronologically, it is found that time witnessed the process of gradually specifying and deepening. At the first stage, researchers focused on the effects and improvements on students' authentic performance, such as fewer grammatical errors, more variety in vocabulary selection and more organized structure, all of which can be measured by quantitative methods and statistical approaches (Biesenbach-Lucas, 2007; Fehr et al., 2012; Lam, 2000; Sauro & Smith, 2010). At the second stage, researchers realized that writing training, as a skill with higher demand on learner's active outputs rather than passive take-in, must take into consideration the feelings and attitudes from the learners themselves so that can enhance their performance from the other side. Therefore, more scholars concentrated on student's perceptions of computer-mediated ESL/EFL writing training (Bringer, Johnston, & Brackenridge, 2006; Chao & Lo, 2011; Fang, 2010).

Feedback, as an important instructing method especially in writing classes, gives effective instructions to learners after their writing process. The importance of feedback is no less than guidance given by the instructor before the writing process. At the third stage, with the further development in technology, especially the common access to the Internet, more researchers noted the necessity to explore the possibility and effects for peers and teachers to give feedbacks via a computer-based platform (Diez-Bedmar & Perez-Paredes, 2012; Kessler, Bikowski, & Boggs, 2012; Lavolette, Polio, & Kahng, 2015) and the effects of feedback directly generated by computer-based software (Gao & Ma, 2019; Silva, 2010). According to Hattie and Timperley (2016), when feedback is given, it is likely to be self-related or at best corrective task-related and to be influenced by perceptions of students' need. As a result, after developing through three stages, the appearance of research on perception of computer-mediated feedback has not gone beyond our expectations. The existing research mainly focus on students' perception of computer-mediated peer feedback (Ciftci & Kocoglu, 2012; Dippold, 2009; Kaufman & Schunn, 2011; Y. F. Yang, 2010), students' perception of automated writing evaluation (Diklil & Bleyle, 2014; Li et al., 2014) and the comparison between these two kinds of feedback (Lai, 2010).

The studies mentioned above are intimately related to learners' perceptions of computer-mediated feedback in ESL/EFL writing. They referred to different aspects and explored students' attitudes in distinct but connected situations. There is no doubt that all of them are very insightful to further research in related fields. Some of them are discussed in syntheses which took feedback of computer-mediated ESL/EFL writing as a whole (Aslan & Ciftci, 2019; Chen, 2014). However, there has been no specific review study on this aspect so far, which

means the features of students' perceptions of feedback are still not summarized and dissected. Thus, the present study aims to fill such a research gap by collecting and synthesizing 34 empirical studies related to perceptions of computer-mediated feedback.

2. Literature Review

In this section, the researcher reviewed some previous studies that are important and relevant to this current research. Firstly, the working definition of terminologies were clarified. Then, the development of integrating computer technology and teaching of second language writing was briefed. Thirdly, the theoretical construction of computer-mediated peer feedback (CMPF) and computer-mediated automated feedback (CMAF) were introduced so as to prepare for further discussion.

2.1 Working Definitions of Related Terminologies and Conceptions

Due to the rapid development of computer-mediated language learning, researchers have discrepant understandings of the definition and range of use of some terminologies. In the process of reviewing literature, the researcher found that some scholars consciously or unconsciously mixed the use of some similar terminologies while other scholars, by emphasizing the distinctions between different terminologies, declared their stances and tendencies, and then denied accepting any mixed use of terminologies. In order to clarify the boundary of this review study, here the working definitions of some controversial terminologies are explained.

2.1.1 ESL and EFL

In order to make it more clear and avoid any confusion, it is necessary to briefly explain the reason why two different terminologies, English as a second language (ESL) and English as a foreign language (EFL), are included and regarded as the same in this present study. The researcher was trying to focus only EFL aspect in the initial plan. Nevertheless, in the data collection process, it was found that some of the authors cannot really differ ESL from EFL and mix the usage of these two terminologies. For example, some researchers used ESL in an EFL context. (Bae & Joshi, 2017; Fidaoui, Bahous, & Bacha, 2010; Moghaddam & Mazaheri, 2017; Yamada, Abe, & Fletcher-Flinn, 2005). Hence, the author decided to include both of them in this study and do not deliberately draw the boundary between them in the discussion part.

2.1.2 Computer-mediated and Computer-Assisted

There has always been controversy between these two similar terminologies. On one hand, some researchers (e.g., Chen, 2014; Aslan & Ciftci, 2019) insist that "computer-mediated" means computer technology plays a central role in the process of implementation indicating

that all key steps should be carried out with computer technology as a mediation. On the other hand, they reiterated that "computer-assisted" refers to those studies in which computer effects just as an assistance and the core part are still human related.

The researcher is fully aware that all these intentional distinctions are meaningful and helpful in different research context. After reviewing papers selecting different terminologies, although nuances can be identified, the researcher holds the view that there existing no fundamental discrepancies in the use of different terminologies. In other words, no instinct differences are caused due to the selection of different but similar terminologies. As a review study, it is our duty to collect and synthesize relevant studies as many as possible so as to conduct an inclusive retrospect. Therefore, the author decided to neglect the controversy in definition of terminologies and search with different possible sets of keywords when retrieving qualified papers from the database.

2.2 The Combination of Computer Technology and L2 Writing

After decades of development, there have been a lot of research on computer-assisted ESL/EFL writing. These studies mainly pay attention to the developing trends, popular technologies applied in authentic teaching and learning environments, students' perception and responsiveness to technologies that offer them assistance.

In the 21st century, there is no doubt that learners are exposed to a variety of technologies. Under this circumstance, learners prefer the utilization of digital techs rather than conventional method of writing. For example, Web 2.0 tools are preferred due to their flexibility (i.e., user-generated layouts, ease in functionality, and system integration). Learners can operate the sites at any time and from anywhere with multiple devices, generate their own content, collaborate with peers, and share their work with online audiences (Gentner, 2018).

Among previous studies, a great number of them paid attention to the effectiveness of computer mediated communication (CMC) on the development of learner's performance of L2 writing. Macaro et. al,. (2012) found wikis to be the most commonly used technology in L2 writing after reviewing the use of technology in secondary ESL writing. Rather than learners' attitudes towards the integration of technology into writing, they reported on the facilitative role of computer-assisted language learning (CALL) in writing with respect to critical thinking, stance expressing, and process writing.

Tan et al,. (2006) argued that online writing software and relevant teaching strategies foster teachers to teach digital writing as part of their online learning experience. In this kind of teaching and learning environment, writing becomes a process rather than just a product because of the revision freedom for students. Computer-mediated technologies enable learners to collaborate and this further lead to enhancement of their ESL writing skills because when they write using digital online tools, they show creativity by including their own voice in the essay, thus gaining a sense of authorship for their essays (Zakaria, Yunus, Nazri, & Shah, 2016).

That is to say, learners' creativity is manifested by using computer-assisted technologies in the process of ESL writing.

Computer-assisted technologies can strengthen the motivation and responsiveness of students in the ESL/EFL writing process. There are two main factors that can contribute to a higher effectiveness of using computer-assisted technologies in ESL/EFL writing, that are teachers' perceptions of students' responsiveness to technologies and accessibility to digital tools in school (Mohamed Razali, 2013). According to Majid (2017), computer-assisted technologies have such features that can provide the motivation to improve students' participation.

2.3 CMPF

The advantages and disadvantages of peer and tutor feedback have been discussed in the pedagogical literature of both the higher education and the language teaching field. Rollinson (2005) suggests that the main advantages of peer feedback in the L2 writing class are that students write for an audience and that writers are encouraged ''to formulate her writing in line with the characteristics and demands of the reader'' (p. 25). In addition, according to Dippold (2009), peer feedback can encourage a collaborative dialogue with two-way interaction, and it operates at a level that is less formal and potentially more accessible than tutor feedback. However, there are also several disadvantages to peer feedback. Hyland and Hyland (2006), after summarizing a number of surveys of students' preferences related to types of feedback on foreign language tasks, suggest that foreign language students generally value teacher feedback more highly than peer feedback.

When computer technology is added up into the consideration, the advantages are generalized by Ware and Warschauer (2006) as "provide resources for promoting student peer response online in a range of useful ways. Student papers can be made more widely available, and such collaborative effort can foster a sense of community in the classroom" (p. 110). Moreover, other researchers (e.g.Barrot, 2016; Ciftci & Kocoglu, 2012; Lai, 2010) agreed that computer-mediated tools can speed up the process of feedback.

2.4 CMAF

The origin of automated feedback is the Automated Essay Scoring System (AES) which was ushered in 1966 (Page, 2003). With the development of technologies and the ubiquitous access to the Internet, some automated writing evaluation (AWE) tools, such as Criterion, have been developed to provide formative feedback on various rhetorical and language-related dimensions and supplementary resources in addition to automated scores. According to several previous studies (Enright & Quinlan, 2010; Weigle, 2010), most AES systems have been regarded as positively effective based on the consistency between the automated and human judgements.

At the early stage, research on AWE systems mainly focused on its effectiveness for improving learner's writing performance in standardized tests (Attali, 2004). Then, the foci are gradually shifted towards the using experience from instructors and learners (Chen & Cheng, 2008) and their expectations toward the use of AWE in authentic writing classes (Lai, 2010).

2.5 Summary

In this section, the working definitions of terminologies, the brief history of computer mediated ESL/EFL writing and the initial development of CMPF and CMAF were respectively reviewed. In this process, the researcher comprehensively inspected the overview of this specific field and the track of advancement so far. The researcher also recognized the important issues, some of which have been paid enough attention while others are still left alone.

From these previous studies, the author found that in some studies that focused on feedback towards computer-mediated writing, learners' perceptions of these feedback are referred to as an affiliated part or evidence that served to support the main argument of the paper. The lack of a holistic review of perceptions of computer-mediated writing feedback hindered the further development of related technologies on feedback to writing. Thus, the present study aims to synthesize the features of perceptions on writing feedback and shed light on further research and practices. This review study targets to address two research questions:

1. What are the positive and negative perceptions from learners of computer-mediated feedback in ESL/EFL writing?
2. What are the potential reasons behind these perceptions and how to help them eliminate the negative perceptions?

3. Methodology

This review is based on a systematic analysis of 34 empirical studies published from 2010 to 2020. To ensure the quality and representativeness of the selected articles and the replicability of this study, the search for relevant articles was carried out in the Web of Science database.

As mentioned in Section 2.1, in order to avoid the negative effects brought by uncomprehensive searching keywords. several searches were carried out in the database with different sets of keywords combinations. All the keywords which were used are listed below:

(1) computer mediated *or* computer assisted *or* automated writing evaluation,
(2) ESL *or* EFL,
(3) writ*,
(4) feedback *or* review

These keywords, in different combinations, fell into discrepant slots in the searching engine as filtering conditions and returned 157 papers in the first stage. The output papers were examined based on the inclusion criteria:

(a) The study was presented as an academic article (book reviews, editorial materials, and

review articles were excluded);

(b) The study was published within the past decade. Therefore, the years span was set as from 2010 to 2020.

(c) The study is concerned with computer-assisted/mediated feedback on ESL/EFL writing.

(d) The study had to be empirical, including real human participants, an experiment.

Screening the studies at abstract and full-text levels led to 34 articles for final review. The steps of literature search and inclusion/exclusion are shown in Figure 1.

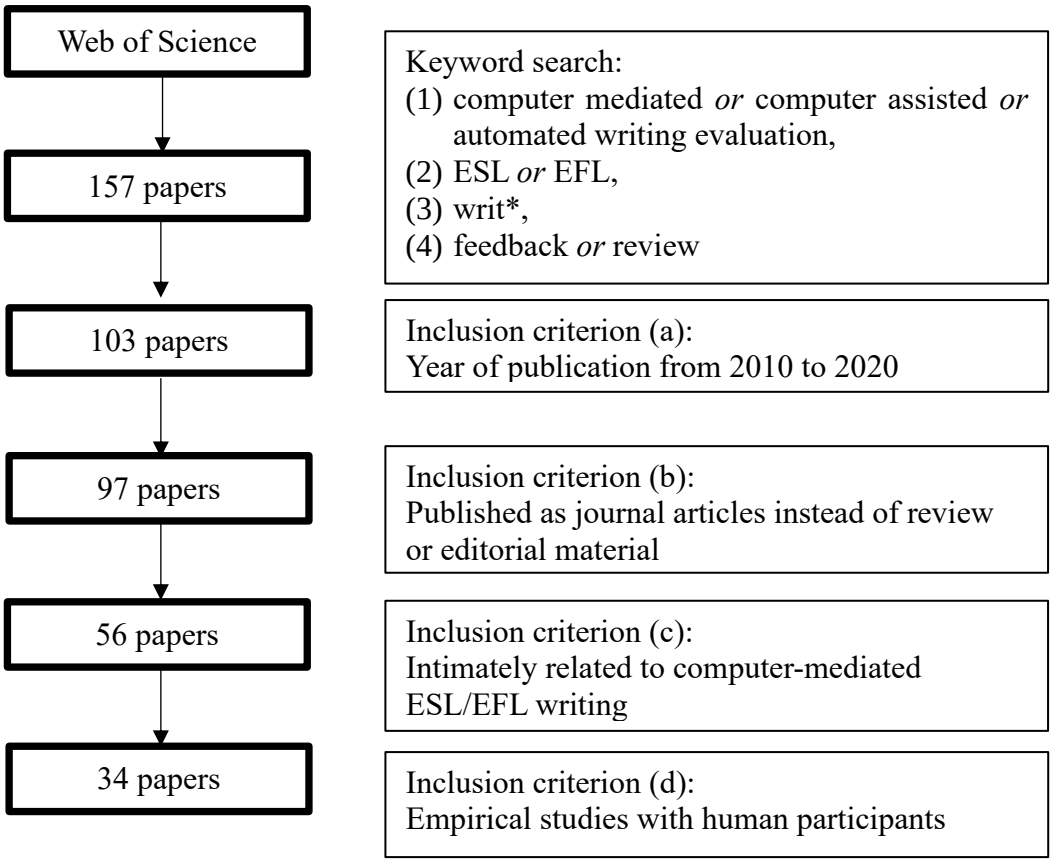

Figure 1. Selection process of papers reviewed in this study.

4. Findings

In this section, the major findings summarized from the review of 34 selected papers are reported. The focus is the presentation of learners' positive/negative perceptions on CMPF and CMAF.

4.1 Designs of research

This review study focuses on learner's perceptions of CMC writing feedback. Among the selected 34 papers, most studies used the open-ended survey questionnaires and the interview as the instrument to collect participants' perceptions of feedback. Only three of them (Dippold, 2010; He, 2016; Koops et al., 2011) took the Likert Scale to retrieve quantitative data and carried out a statistical data analysis. The specific distribution of instruments is listed in the table below.

Table 1. Frequencies of different instruments adopted in the selected 34 papers

Instruments	Questionnaire		Interview	Mixture of interview and qualitative questionnaire
	qualitative	quantitative		
Number	12	3	8	11

In computer-mediated language learning environments, East-Asian learners tend to display a higher degree of interdependence, connection, and collaboration compared to Western counterparts (Chau et al., 2002; Kim et al., 2011; Yang and Morris, 2011). Based on results of these studies, the researcher regarded perceptions as a subjective description generated by participants in different empirical studies. In previous studies on learner's perceptions, several of them have reported the possibility that the culture background of learners will impact their perceptions, especially about peer feedbacks in writing (Chen, 2014; Ho, 2015). Thus, it is necessary for us to review the distribution of participants' nationalities at first, so as to manage our expectations more effectively and predicate the potential situations more precisely. In all the 34 papers synthesized in this review, 11 of them involved Taiwanese participants, 5 of them involved Mainland Chinese participants, 3 of them respectively recruited participants from Hong Kong, Japan and the Philippines. That said, many participants in these studies might be affected by the context of East Asian culture. The detail of distribution is presented in Figure 2.

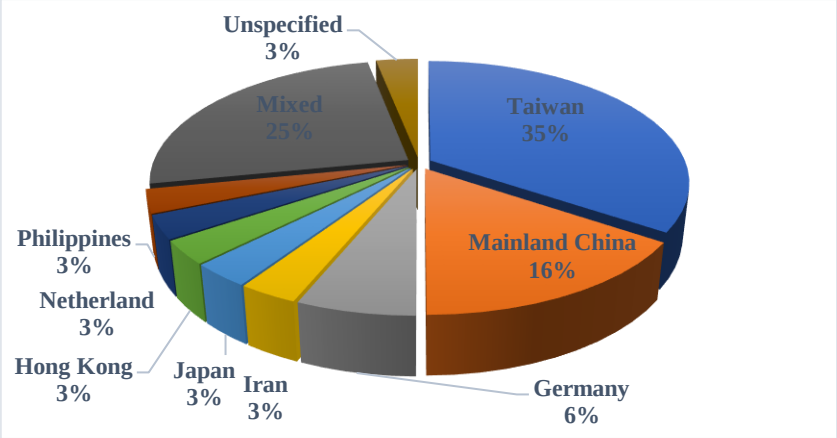

Figure 2. Country/Region Distribution of Participants

4.2 Perceptions of CMPF on ESL/EFL writing

This section extracts and dissects learners' positive and negative perceptions of CMPF frequently reported in the studies under review.

4.2.1 Learner's positive perceptions of CMPF

In general, most participants in studies under review hold a positive attitude towards computer-mediated peer feedback in ESL/EFL writing. This result is not out of expectations. Specifically, the advantages and positive effects of computer-mediated peer feedback are various towards participants on different proficiency levels. In the selected studies, the positive effects of CMPF mentioned participants mainly can be generalized into the following categories (See Table 2).

Table 2 Generalization of learner's positive perceptions of CMPF

Positive perceptions	Relevant Selected Studies
1. The CMPF makes the receiver see the suggestions and corrections more easily.	Chang, Cunningham, Satar, & Strobl (2017); Chao & Lo (2011); He (2016)
2. Anonymity of the computer-mediated environment.	Liou & Peng (2010); Shang (2017); Wu, Petit, & Chen (2015); Y. F. Yang (2010)
3. The feedback giver also has an improvement in writing proficiency and editing skills.	Dippold (2010); Fang (2010); Ho (2015); Kaufman & Schunn (2011); Lin (2015)

4.2.2 Learner's negative perceptions of CMPF

After reviewing all the selected papers relating to CMPF in ESL/EFL writing, the researcher finds that more than two thirds of the papers refer to learners' negative perceptions. This ubiquity reminds us there are still many shortcomings and issues unsolved that undermine

the effects of CMPF in ESL/EFL writing. The negative perceptions mainly focus on the following areas.

Table 3 Generalization of learner's negative perceptions of CMPF

Negative perceptions	Relevant Selected Studies
1. Worries about the quality of peer feedback.	Dippold (2010); Fang (2010); Ho (2015); Kessler et al. (2012); Barrot (2016); Seyyedrezaie et al. (2016); Tai, et al,. (2015)
2. Students prefer teacher's feedback than peer's feedback.	Y. L. Chen, et al. (2011); Li & Li, (2018); Tai et al., (2015)
3. Students prefer to be the receiver than the giver of peer feedback	J. R. Li & Li, (2018); Tai et al., (2015)

4.3 Perceptions of CMAF on ESL/EFL Writing

Computer-mediated automated feedback is generated by the automated writing evaluation (AWE) systems. Different from the CMPF, CMAF is implemented in a unilateral and automatic way, which means learners can only see the final assessment results without having a clear understanding of the reasons and specific process of judgement. Among all the 34 selected papers, 8 of them focused on or partly refer to CMAF. In this section, the researcher respectively discussed learners' positive and negative perceptions towards the widely used AWE systems.

4.3.1 Learners' positive perceptions of CMAF

The participants commonly expressed such an idea that although they were fully aware of the problems with AWE system, they still trusted it (Diklil & Bleyle, 2014; Li et al., 2014) and deemed the AWE systems could help them improve their writing capacities (Fang, 2010; He, 2016; Gao and Ma, 2020). Most mentioned advantages of AWE are listed below (See Table 4).

Table 4 Generalization of learner's positive perceptions of CMAF

Positive perceptions	Relevant Selected Studies
1. AWE systems have an efficient and accurate revising ability to recognize grammatical and mechanical errors.	He (2016); Bai and Hu (2017); Gao and Ma (2020)
2. AWE system has the fast speed to offer feedback.	Diklil and Bleyle (2014); Shintani, (2016); Lee (2020)

4.3.2 Learners' negative perceptions of CMAF

While the advantages of CMAF are generally similar in different selected papers, mainly focusing on its efficiency and accuracy on mechanical errors, the negative perceptions are also ubiquitous and frequently reported in all the related studies. To facilitate descriptions and understanding of the whole picture, the highly reflected negative perceptions and relevant studies are listed in Table 5.

Table 5. Generalization of learner's positive perceptions of CMAF

Negative perceptions	Relevant Selected Studies
1. The AWE system is not a reliable grader.	Fang (2010); He (2016); Lai (2010); Gao and Ma (2020)
2. AWE feedback is too general/vague.	Fang (2010); He (2016)
3. Learners prefer feedback from instructors or peers than from AWE.	Diklil and Bleyle (2014); He (2016); Lai (2010)
4. AWE feedback is limited to mechanical errors, lacking the ability for a holistic judgement.	Bai and Hu (2017); He (2016); Li et al., (2015); Roscoe et al., (2017)

5. Discussion

After synthesizing the perceptions of CMPF and CMAF, this section steps further to analyze reasons that lead to those perceptions. In addition, the identified research gaps are also stated for further notice.

5.1 Reasons for positive perceptions of CMPF

The CMPF makes the receiver see the suggestions and corrections more easily (Chang, Cunningham, Satar, & Strobl, 2017; Chao & Lo, 2011; He, 2016), so that they can carry out a revision more conveniently and have a better understanding of where an improvement is needed to be made.

This advantage is mainly brought out by the feasibility of the technology. No matter in asynchronous platform (e.g., forum and blog) or synchronous platform (e.g., Google Docs), learners can use the annotation tools to precisely highlight the errors and corrections and the receiver can use the tool of finding to locate those parts that need to be revised. There is no doubt that this is a positive effect of the progress of technology.

The second most mentioned advantage is triggered by one of the most important features of CMPF, that is anonymity. Participants from several different studies perceived less face-threatening compared with face-to-face peer feedback (Liou & Peng, 2009; Shang, 2017; Wu et al., 2015; Yang, 2010) and this makes them express their suggestions and opinions toward

their peers' writings with less hesitation. Moreover, it is noticeable that most studies that report this kind of perception consisted of participants coming from Taiwan or mainland China. This result corroborates with the statistics put forward in Figure 2, that East Asian learners tend to care more about the potential damage to interpersonal relationship caused by negative feedback they offer to others.

The third most frequently mentioned advantage of CMPF is that not only the receiver of feedback, but also the learner who offer the feedback, perceived an improvement in their ability for editing (Dippold, 2010; Fang, 2010; Ho, 2015; Kaufman & Schunn, 2011; Lin, 2015). In asynchronous CMPF mode, some learners believe that giving feedback to peers enhances their ability to edit their own work and monitor their own language production by observing and learning from their peers (Aslan & Ciftci, 2019). This is a meaningful finding that fewer reported in traditional face-to-face feedback. The researcher infers that one potential reason lies in the feature of asynchronous feedback because only in such an environment can learners have more time and opportunity to examine and absorb the good usages in peers' writings.

To briefly summarize, the advantages perceived by learners in CMPF are mainly the results of advancement in technologies which create the better environment for learners to mutually cooperate. This finding reiterates that computer technologies can indeed facilitate the effects of peer feedback in ESL/EFL writing and meanwhile improve learners' linguistic competence. In the section, more attention is paid to the negative perceptions coming from learners in CMPF so as to locate the gap that need to be filled.

5.2 Reasons for learner's negative perceptions of CMPF

First and foremost, learners express their worries about the quality of CMPF. On one hand, some of them have no confidence in their own English proficiency and feel that they cannot offer qualified feedback to their peers (Dippold, 2010; Fang, 2010; Ho, 2015; Kessler et al., 2012). On the other hand, some learners with higher proficiency complain about the feedback with bad quality offered by their low-proficiency peers. For example, some can give structural suggestions and some can only give only error corrections (Chao & Lo, 2011); peer feedback mostly focus on content revisions such as spelling and grammatical errors while lack of the examination towards the holistic structure and organization of the writing (Seyyedrezaie et al., 2016; Tai, et al., 2015); the peer who offer the feedback did not really know the intention that the author want to express or even without reading the writings, then made inappropriate revisions (Barrot, 2016). All these problems undoubtfully cause detriment to learners' motivation on CMPF. Therefore, one of the side-effects was that the adoption rate of peer feedback by the author was lower than expectation (Liou & Peng, 2010).

The worry of peer feedback quality is caused by insufficient language proficiency and different language level. Targeting at this issue, the author proposes two feasible suggestions. First, before the process of peer feedback, necessary training should be carried out on

participants in order to enhance their awareness of basic principles of CMPF. According to Liou and Peng (2010), training on participants can significantly increase the effects and learners' satisfaction on CMPF of EFL writing. Second, instructors should intervene at an appropriate timing, to offer guidance and properly arrange learners into different pairs or groups according to their different levels. Dippold (2010) found students reported that explicit guidelines coming from tutors can make it easier for students to provide feedback.

The second and third frequently mentioned negative perception are that students prefer teacher's feedback than peer's feedback and prefer to be the receiver than the giver of CMPF (Chen et al., 2011; Li & Li, 2018; Tai et al., 2015). On the second issue, besides the reasons have been analyzed above related to students' capability, another factor that cannot be neglected is the distrust of peers caused by equal status and thus lack of convincing. On the third issue, learners still reflected to be lack of self-confidence. Students' motivations should be further analyzed, and instructors need to encourage them mutually help.

From the discussion above, it can be generalized that learners' negative perceptions of CMPF on ESL/EFL writing are mainly caused by factors related to participants rather than the technology itself. This reminds us that among CMPF, collaboration and trust are indispensable, so that the characteristics and abilities of learners must be carefully taken into consideration. Moreover, the intervention, training and guidance from instructors are also important but insufficient, thus should be strengthened in the future practices.

5.3 Reasons for learners' positive perceptions of CMAF

Firstly, the AWE system has an efficient and accurate revising ability to recognize grammatical and mechanical errors. He (2016) reported that AWE could enlarge learners' vocabulary size while reduce their grammar and spelling errors. Bai and Hu (2017) found that AWE could efficiently and accurately find and revise errors like misspellings, spacing, errors and failures to capitalize the first letter of a sentence; moreover, the *pigaiwang* online program could offer many synonyms for flexible substitutions.

Secondly, an important advantage of AWE is speed. According to participants in Diklil and Bleyle (2014), the feedback given by the instructors often took a much longer time. Moreover, in asynchronous computer-mediated peer feedback (Shintani, 2016), participants reflected that they often need to wait an uncertain long time for the peer feedback. However, in AWE, the feedback is generated just several minutes after the essay was submitted.

These advantages discussed above are the foundations of learners' trust on AWE. The researcher found that these benefits all result from the automation of the program. Thanks to strictly programmed settings, the AWE system can easily recognize common ungrammatical errors and offer precise revisions. Similarly, due to the faster computational speed and Internet access, the feedback from AWE can be immediately received by the learners. However, the rigid designed programs also caused many negative effects and perceptions, which will be

discussed in the section below.

5.4 Reasons for learners' negative perceptions of CMAF

Firstly, while several papers reported that students held a positive attitude on AWE, they were only willing to regard AWE as a useful tool for writing practice rather than a reliable grade judger. The issues mainly lay in that the grading results are unfair and inaccurate because the AWE system cannot precisely identify the complicated structures used by learners and often recognize a correct usage as wrong then lower the grade (Gao and Ma, 2020).

Secondly, the feedback from AWE system tends to be too general and vague, which cannot really help learners to improve their writings. The findings in He (2016) reported that the adoption rate of AWE revision by learners was low, corroborating this negative perception.

Thirdly, AWE feedback is the least preferred among three different kinds of feedback. On one hand, students regarded peers more as real audience and highly valued peer comments. Accordingly, "they adopted comments from peers for revision more often, preferred writing with peers and revised more with peers" (Lai, 2010, p. 440). It was thus sensible that they enjoyed writing activities with peers and expected more PE activities." On the other hand, learners also expressed a favor to teacher's feedback because they have better quality (Diklil & Bleyle, 2014), and more importantly, teachers are someone learners can talk to and negotiate with so that learners can better understand teachers' advice (He, 2016).

Fourthly, it is generally reflected that the revisions AWE can offer are rather limited. As mentioned above, AWE systems are good at revising the mechanical and rigid grammatical errors. Nevertheless, when facing a more complicated situation, AWE is unsatisfactory. For example, according to Bai and Hu (2017), *pigaiwang* terribly performed on issues about collocations, because the corpus in this software platform is not large enough to support the program correctly recognize various collocations.

After discussing about these frequently mentioned negative perceptions of CMAF, an initial summary can be drawn, that is, learners' complaints on CMAF are fundamentally caused by the insufficient abilities of the programs to accurately identify then logically analyze the writings learners submitted.

Therefore, the researcher proposed that all the AWE programs should manage to enlarge the corpus and upgrade the algorithm so that the ability of the system can be improved. With the rapid development of Artificial Intelligence, Machine Learning and Big data, these disadvantages can be addressed in the near future.

5.5 Research gap

This review study focuses on perceptions of CMAF and CMPF. However, among all the 34 selected papers, only 3 of them fully or partly referred to the perceptions from instructors (Clark-Gordon et al., 2019; Fuchs et al, 2017; Li et al., 2015). They consistently reported a

positive attitude towards CMAF and CMPF also difficulty in managing the class or training the learners before using technologies.

The insufficient research on instructors' perceptions on computer-mediated feedback can be regarded as an obvious limitation for existing empirical studies on related issues. Instructors' participations can significantly influence the effects of CMPF and CMAF. Many of the reviewed studies reported the necessity of instructor involvements. Students were found to have more positive attitudes toward AWE feedback when it is combined with teacher feedback (Diklil & Bleyle, 2014). The students' positive reaction to the use of AWE corrective feedback seems to be closely connected to their instructors' perspectives and pedagogy (Li et al., 2015, p. 9). More teacher involvement and more space for peer discussion were required to improve future peer review activities (Lai, 2010). Hence, to fill this research gap and further improve the effects of CMAF and CMPF, more studies should focus on instructors' attitudes on computer-mediated feedback.

In addition, more than half of the studies under review have been conducted in East-Asian area. This inclination, on one hand, guaranteed detailed research in one specific social-cultural context. Nevertheless, it also suggests that more attention should be attached to learners in other cultural backgrounds. Furthermore, comparative studies on the effects of CMPF and CMAF in different social-cultural contexts can be insightful.

6. Conclusion

In this review study, the researcher analyzed 34 papers published in the last decade and related to perceptions on computer-mediated peer feedback and computer-mediated automated feedback on ESL/EFL writing. Among the four skills, writing is commonly recognized as the most difficult one for L2 learners to fully develop (Aslan & Ciftci, 2019). This study retrieved data from high-quality empirical studies and tentatively identified the commonality and differences. The author sincerely hopes the findings of this study can be beneficial to all the stakeholders.

This study focuses on learners' positive/negative perceptions of CMPF and CMAF in ESL/EFL writing and made several findings: (1) towards the CMPF on ESL/EFL writing, learners' positive perceptions are resulted from technology advancement while negative perceptions are generally caused by different language proficiencies among the peers; (2) toward the CMAF on ESL/EFL writing, the convenience brought by automatic programs are the foundations of learners' positive perceptions, while the negative perceptions are caused by the insufficient resources and inappropriate designation of the programs; (3) when compared, CMAF is less favorable than CMPF, and both of them are considered less valuable than teachers' feedback; This review also identified two research gaps that need to be filled in the future. On one hand, there has been few research on instructors' perceptions of CMPF and CMAF. On the other hand, more studies in different social-cultural contexts are needed.

Targeting at the negative perceptions reported above, the researcher proposed several suggestions for eliminating them and improving the effects of CMPF and CMAF in ESL/EFL writing. Firstly, the intervention, training and guidance from instructors should be strengthened in the future to ensure learners can perform better in peer feedback. Secondly, AWE programs should manage to enlarge the corpus and upgrade the algorithm to provide more accurate gradings and revisions. Thirdly, instructors, when implementing CMPF and CMAF, must take a more active participation in the whole process to guarantee the effects.

This study has several limitations. On one hand, the number of selected papers is not enough so some perceptions might have been neglected. On the other hand, this study does not take an analytical framework, so that is less theoretical explanatory to some extent. In the nutshell, the effects of feedback are highly related to participants' subjective perceptions, further research should overcome these limitations and examine more details on this meaningful issue.

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