



Literature Review of Automated Written Corrective Feedback

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INTRODUCTION

Writing is an inseparable part of language learning. It is the latest achievable skill for foreign language learners since it requires becoming familiar with both high-level skills of planning and organization and low-level skills of language use (Sadeghi & Mosalli, 2013). People use writing to express their emotions and thoughts and communicate with the reader (Olshtain, 2014). Moreover, writing can be a means of communication for learning disciplinary courses and exchanging information in universities (Coffin et al., 2003, as cited in Sanosi, 2022). Scholars need writing for publishing papers in different disciplines (Raitkaya and Tikhonova 2022, as cited in Sanosi, 2022). The knowledge of rhetorical conventions, linguistic knowledge, and the use of vocabulary, syntax, and cohesive devices are more important in academic writing in comparison to other genres (Utkina, 2021). On the other hand, students have a negative attitude toward writing, and asking them to write frustrates them (Graham et al., 2005, as cited in Arindra & Ardi, 2020). In this situation, each student needs to write accurately and instructors try to teach them how to write correctly and effectively (Hadfield & Hadfield, 2008; Brown & Lee, 2015). Writing is a skill that is being neglected in Iran's educational system (Biria & Jafari, 2013). As the result, the written products of Iranian learners do not have enough quality, and teachers are supposed to correct learners' errors (Farrahi Avval et al., 2021). One way to deal with the errors and improve the accuracy of the produced texts is the provision of written corrective feedback (WCF).

WCF can be delivered in paper and pencil format or through new technologies. Traditionally, WCF was provided on hard paper copies, but in recent years computer-mediated WCF has been used (Bitchener & Storch, 2016). Providing computer-mediated WCF instead of hard paper copies enables students to engage with the given feedback and understand it better since students had some problems with reading the teachers' handwriting and they misunderstood the comments (Crook et al., 2012). Moreover, taking advantage of new technologies makes the teaching and learning process interesting for learners (Farrahi Avval et al., 2021), especially for the new generation who prefers to receive learning content via technology (Ko, 2019). Thus, utilizing it, whether in or out of the classroom, increases the motivation of technophiles (Stockwell, 2013). WCF is an inseparable part of a writing class, and it can benefit from new technologies too. Besides learners, teachers are also passionate about taking advantage of computer-mediated WCF because some of them neglect to provide WCF due to the large class sizes and time limitations. In this situation, computer-mediated WCF can remove these barriers (Xu & Peng, 2017).

The purpose of this literature review is to summarize the essential findings and new trends related to computer-mediated WCF, especially automated mode, and identify the mentioned problems and gaps in the literature.

This study has some benefits for teachers, teacher educators, and students. Teachers can become familiar with different automated writing evaluation tools and the way they can use these tools to reduce their workload and save class time. Also, teacher educators can take advantage of this study to inform teachers and student-teachers about new trends related to WCF and the existing gaps and drawbacks. Students can also utilize the study to identify the most suitable automated writing evaluation tool based on their needs.

A significant proportion of language learning procedures happens in an online format, thus focusing on emerging technologies for providing WCF, such as tools of artificial intelligence (AI) and AWE can be essential for both teachers and students (Klimova & Pikhart, 2022; Sanosi, 2022). AWE refers to software that can assess learners' writing automatically (Sanosi, 2022), and the WCF provided by an AWE tool is called Automated Written Corrective Feedback (AWCF) (Barrot, 2021). AWE utilizes complicated natural language processing (NLP) techniques, semantic analysis, and artificial intelligence (AI) in order to provide learners an appropriate WCF with the aim of not only increasing learners' writing accuracy, but also improving their fluency (Mohsen, 2022). The program works by comparing learners' written texts with a large database of writing in the same genre based on a specific rubric (Hockly, 2019). Most of the AWE programs provide WCF in terms of both form and content (Cotos, 2014, as cited in Mohsen, 2022). In other words, they mainly correct errors related to the organization (i.e. the structure of the text and paragraph transitions), language use (i.e. grammar and vocabulary), mechanics (i.e. spelling and punctuation), tone, and plagiarism (Deane, 2013, as cited in Stevenson & Phakiti, 2019; Sanosi, 2022). The newest generation of AWE tools can integrate into web browsers, office productivity software, Google Docs, and the keyboard of mobile devices (Ranalli & Yamashita, 2022). AWE tools are now widely used in Massive Open Online Courses (MOOCs) and Learning Management Systems (LMSs) due to the large-scale enrollments and the difficulty of scoring and providing feedback by teachers (Balfour, 2013, as cited in Stevenson & Phakiti, 2019).

There are various AWE programs, but the most famous ones are Grammarly, Correct English, Criterion, Turnitin, Pigai, The Writing Pal, Write Lab, Cywrite, Writing Assistant, My Access, Write to Learn, and E-rater.

RESULTS

Reviewing literature reveals that AWCF has a positive effect on writing accuracy, since utilizing it increases the scores and decreases the number of errors (Stevenson & Phakiti, 2014, as cited in Stevenson & Phakiti, 2019). The reason lies in the specific features of AWE that distinguishes it from the traditional way of providing feedback. As Barrot (2021) declared, AWCF corrects a wide range of errors. It provides comprehensive direct WCF in a few seconds. Furthermore, it gives consistent and accurate metalinguistic explanations that teachers are unable to provide due to the lack of time. Finally, the provided feedback is neutral. It means that it does not depend on the teacher's mood or current state of mind (Barrot, 2021). Additionally, AWCF improves students' writing accuracy based on the three factors of adaptive CF, noticing of forms and gaps, and learners' engagement in self-directed learning.

Implementation of the mentioned AWE tools in a writing class depends on teachers, but it is essential for EFL students to take advantage of AWE, since L2 writers are rarely exposed to accurate models of English, and committing errors frequently can lead learners toward the fossilization of incorrect constructs. AWCF can provide accurate models to learners to prevent this situation (Stevenson & Phakiti, 2019). In spite of the criticism against AWE that it ignores the social aspect of writing, the actual integration of AWCF can lend itself to the interactions and pedagogical purposes (Stevenson & Phakiti, 2019). Integration of AWE into the classroom refers to the combination of AWCF with a teacher or peer-provided feedback (Stevenson & Phakiti, 2019). One way to integrate AWCF with teacher feedback is to use AWCF as the main type of feedback and teachers insert some comments through the AWE system. In this way, AWCF enhances learners' autonomy and teacher feedback has a coaching role (Grimes & Warschauer, 2010, as cited in Stevenson & Phakiti, 2019). Another option is to take advantage of AWCF only in the initial drafting and revising phase, and during other phases, students can receive teacher-provided WCF (Chen & Cheng, 2008, as cited in Stevenson & Phakiti, 2019). In this way, teachers can only concentrate on the correction of higher-level aspects of writing (e.g. content, organization, critical thinking) (Stevenson & Phakiti, 2019).

DISCUSSION

Based on the conducted studies, some gaps are identified. First, there are not many studies investigating the effect of different types of digital feedback on writing tasks (Altamimi & Masood, 2021, as cited in Klimova & Pikhart, 2022). Also, more studies are needed to investigate the harmful effects of digital WCF, such as lack of social interaction or AI addiction (Klimova & Pikhart, 2022). Concerning AWE, the comparison between the effect of AWE on first and L2 writing has been overlooked in the literature (Stevenson & Phakiti, 2019). Also, investigating the way AWCF can be integrated into L2 writing classes in different contexts is beneficial (Stevenson & Phakiti, 2019). Furthermore, only a few studies have compared the effect of AWCF with the type of feedback provided by a teacher or a peer (Stevenson & Phakiti, 2019). Moreover, the transfer effect of AWE and the cognitive and affective engagement of learners has not been investigated extensively. That is, whether utilizing AWE causes better writing and independent revision of the texts or not (Stevenson & Phakiti, 2019). The effect of AWCF on revision strategies is another topic that needs some focus (Stevenson & Phakiti, 2019). Teachers' perspective toward AWE is another topic that needs further attention. Additionally, investigating the effect of different types of AWE tools can assist teachers. For example, focusing on the effect of focused versus unfocused WCF, treatable versus untreatable errors, and global versus local errors in Grammarly, or measuring the long-term effect of Grammarly on specific error categories such as mechanics can be useful (Sanosi, 2022).

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