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EFL Learners' Use of Automated Corrective Feedback in Saudi Tertiary Education

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Abstract

This study investigated the effectiveness of automated written corrective feedback (AWCF) in supporting learning of English as a foreign language (EFL) among undergraduate students in Saudi tertiary education, with particular focus on how learners responded to and benefited from AWCF. Drawing on a mixed-methods approach, data were collected from students' written drafts before and after using AWCF, as well as from a structured questionnaire designed to capture their perceptions and patterns of engagement. The findings revealed that AWCF significantly assisted students in identifying and revising grammatical and spelling errors, supporting claims about AWCF utility in enhancing surface-level linguistic accuracy. Moreover, students exhibited strong engagement with the tool, critically assessing its feedback- particularly in instances involving local proper nouns and context-specific language use. While students generally trusted AWCF, they did not accept all suggestions uncritically, reflecting the development of self-monitoring skills and greater writing autonomy. The findings underscore the essential role of teacher alongside AWCF, particularly in addressing higher-order writing concerns and promoting students' critical thinking. The study recommends an integrated feedback approach that combines the advantages of both AWCF and teacher feedback to enhance learning outcomes.

Keywords: Automated written corrective feedback (AWCF); autonomous learning; second language learning; AWCF tools; writing development.

1. Introduction

Facilitating the use of modern technology is an essential instrument for national and multinational institutions worldwide, including the educational sector. This practice has undergone significant expansion during and after the COVID-19 pandemic. In addition, recent developments in modern technology have led to the use of these technologies, including artificial intelligence (AI). Integrating modern technology into the educational sector has opened up new avenues for enhancing learning experiences and promoting autonomous learning. For example, the field of automated written corrective feedback (AWCF) tools and their role in second language (L2) education has attracted a great deal of attention (Barrot, 2023; Ghufron, 2019; Hsu, 2017; Jiang et al., 2020; Link et al., 2022; Miranty & Widiati, 2021; Ranalli, 2021; Sauro, 2009; Shang, 2022; Tian & Zhou, 2020). Nonetheless, research on written corrective feedback has shifted from exploring its necessity to analysing the most effective methods of providing it (Link et al., 2022). Barrot (2023) explored the impact of AWCF on improving the accuracy of college students' written work, Ghufron (2019) investigated teachers' and students' perspectives on Grammarly and teachers' corrective feedback, Hsu (2017) studied the relationship between English as a foreign language (EFL) students' uptake of AWCF, Jiang et al. (2020) studied the impact of AWCF on teachers' feedback practices, Miranty and Widiati (2021) highlighted the advantages and disadvantages of Grammarly, Ranalli (2021) explored students' confidence in AWCF, Sauro (2009) investigated the role of AWCF in the development of adult learners' L2 knowledge, and Shang (2022) compared online peer feedback and AWCF on the writing performance of L2 students. Tian and Zhou (2020) explored students' engagement with automated, peer, and teacher feedback. Interest in the role of modern technology in education, in general, and specifically in L2 education in Saudi Arabia has significantly expanded in recent years (Almayez et al., 2025; Alomaim, 2024; Altameemi & Alomaim, 2022; Alzahrani & Sheirah, 2021). Studies in the Saudi context have focused on corrective feedback strategies provided by teachers (Alomaim, 2023; Alshammari & Alomaim, 2025)

Rather than focusing on evaluating the effectiveness of using modern technology in the field of foreign language education, this study engages directly with how modern technology should be effectively used in providing corrective feedback to EFL learners in Saudi Arabia. The study builds on the argument that AWCF is effective in developing students' learning of L2 and focuses on analysing AWCF's potential to enhance the learning experience of Saudi EFL students and whether it encourages autonomous learning.

2. Literature Review

In language classrooms, AWCF is used extensively (Guo et al., 2022; Weigle & Malone, 2016; Yu, 2015). However, Woodworth and Barkaoui (2020) assert that even though automated written evaluation (AWE) and AWCF are used

interchangeably, they are not the same. Table 1 points out the major differences between AWE and AWCF.

Table 1. *Essential Differences between AWE and AWCF (adapted from Woodworth and Barkaoui, 2020)*

No.	AWE	AWCF
1	Does not provide instantaneous feedback.	Provides instantaneous feedback.
2	Does not provide metalinguistic feedback on grammatical errors.	Provides metalinguistic feedback on grammatical errors.
3	Can be moderated by teachers.	Cannot be moderated by teachers.
4	Evaluates writing quality.	Does not evaluate writing quality.
5	Provides a portfolio of students' work.	Does not provide a portfolio of students' work.
6	Includes classroom management tools.	Does not include classroom management tools.
7	Focuses on writing development.	Focuses on grammatical errors.

Several advantages of AWCF have been pointed out in the literature. First, AWCF provides continuous and simultaneous corrections during composing texts (Alharbi, 2023). Its aim is to enhance consistent practices of the users and is crucial in enhancing L2 education (Miranty & Widiati, 2021). Second, AWCF is more extensive than teacher feedback (see, for example, Tian & Zhou, 2020). Teachers' attitudes towards AWCF vary regarding its effectiveness (Jiang et al., 2020) but are generally positive (Lim & Phua, 2019). Third, AWCF facilitates teachers' feedback in various aspects, including mode, time, types, levels, intentionality, teacher–student interaction, transcendence, and meaning (Jiang et al., 2020). AWCF also provides time savings for teachers in marking their students' work (Lim & Phua, 2019). Link et al. (2022) found that AWCF positively influenced the amount of syntactic feedback provided by teachers. It assisted language teachers in shifting their focus from syntactic quality to in-depth quality, encompassing organisation, argumentation, and content development (Link et al., 2022).

AWCF not only enhances the effectiveness of syntactic quality but may also help improve students' motivation and development (Woodworth & Barkaoui, 2020). AWCF enhances autonomous learning (Barrot, 2023), as it positively influences students' engagement with writing (Zhang, 2020). It promotes students' self-

monitoring and evaluation of their own work, thus assisting them in revising it (Zhang, 2020). Metalinguistic feedback and autonomous learning through AWCF improve students' ability to notice their errors (Barrot, 2023). Metalinguistic feedback helps students improve their familiarity with grammatical rules (Barrot, 2023). AWCF helps students avoid repeating the same errors (Shintani, 2016).

On the other hand, AWCF has several limitations. Feedback from AWCF is limited in coverage (John & Woll, 2020). The primary focus of AWCF is on grammatical errors (Alharbi, 2023; John & Woll, 2020), and its secondardy focus is on lexical errors (Alharbi, 2023). Thus, structural and organisational errors are not major concerns of AWCF (Alharbi, 2023). Additional drawbacks of AWCF include overcorrection, overload of cognitive information, and the limited metalinguistic feedback it provids (Barrot, 2023). AWCF cannot stand alone in providing support in L2 education (Ghufron, 2019). Based on these limitations, John and Woll (2020) suggest that AWCF cannot entirely replace human feedback. It acts as a complement to, not a substitute for teachers' feedback (Al Ghaithi & Behforouz, 2025; Link et al., 2022; Woodworth & Barkaoui, 2020). Hence, AWCF should not be used alone without teacher feedback (Link et al., 2022). Teachers' corrective feedback is essential, even with the presence of AWCF (Ghufron, 2019). Corrective feedback by teachers is more effective than AWCF (Lv et al., 2021). For instance, one of the participants in Tian and Zhou's (2020) study shifted their attitude towards teachers' feedback from negative at the beginning of the study to positive by the end. Tian and Zhou (2020) found that teachers' feedback yields the highest rate of uptake, whereas automated feedback yields the lowest rate of uptake. Students tend to prefer AWCF to peer feedback in improving their use of lexical items (Shang, 2022). However, peer feedback is better than AWCF in terms of improving sentence writing, reducing grammatical errors, and enriching the use of lexical items (Shang, 2022). Therefore, students do not believe that AWCF can replace peer feedback (Shang, 2022).

Students' attitudes towards AWCF are significantly related to its effectiveness (Jiang et al., 2020). This positively influences their engagement with it (Zhang, 2020). Koltovskaia (2020) classified students' uptake of AWCF into three categories: accepting the suggested modification, rejecting the suggested modification, and substituting the suggested modification with a personally selected modification. Students in general have positive attitudes towards AWCF (Lim & Phua, 2019; Mariappan et al., 2025). They perceive AWCF as a necessity to improve the accuracy and quality of their work (Miranty & Widiati, 2021) and feel that AWCF provides immediate and accurate corrective feedback (Zhang, 2020). Students are satisfied with AWCF's customised and personalised feedback (Barrot, 2023) and believe that it addresses errors that are rarely dealt with by teachers (Zhang, 2020). AWCF could be used as a supplement to support anxious students (Waer, 2023) by reducing their anxiety and enhancing their grammatical knowledge (Waer, 2023). Ranalli (2021) contended that confidence is a core issue in students' engagement with AWCF. For example, Link et al. (2022) asserted that students tended to revise teachers' feedback more often than they did with AWCF. Conversely, Ranalli (2021) found that, except for lexical feedback, students tended

to proofread AWCF rather than learn from it. Therefore, they need to be taught how to use AWCF critically (Guo et al., 2022; John & Woll, 2020; Rahimi et al., 2025). Some L2 students are unable to deal smoothly with AWCF (Ghufron, 2019). They need to learn its strengths and weaknesses (John & Woll, 2020). However, it appears that language proficiency has a positive influence on students' motivation to use AWCF (Shang, 2022; Zhang, 2020). Students with advanced linguistic proficiency tend to engage more with AWCF than those with lower proficiency (Zhang, 2020). The relationship between students' experiences with learning the language and their use of AWCF is interchangeable. Their motivation to learn L2 positively influences their use of AWCF to improve their learning experience (Hsu, 2017), and their engagement with AWCF positively influences their learning experience (Zhang, 2020).

Examples of AWCF tools include Grammarly, ProWritingAid, and Ginger. This study focuses on the use of Grammarly as the sample. It is available as an independent tool that can be installed for free on personal computers, laptops, tablets, and mobile phones. It can also be installed as an extension on various platforms, such as word processing tools. Grammarly is available on its official website and as an add-in for Microsoft Office (Guo et al., 2022). Dodigovic and Tovmasyan (2021) classify grammatical errors that are highlighted by Grammarly into three types: accurately highlighted errors, inaccurately highlighted errors, and grammatical errors that Grammarly ignores.

Several advantages of Grammarly cannot be disregarded. Compared to traditional corrective feedback, Grammarly is time effective (O'Neill & Russell, 2019). It provides easy access, real-time feedback, and explicit feedback (Guo et al., 2022). Grammarly assists in reducing lexical, grammatical, spelling, and punctuation errors (Ghufron, 2019), it produces personalised and targeted feedback (O'Neill & Russell, 2019), and is valued for its simplicity and speed (Koltovskaia, 2020). Teachers and students have positive attitudes towards Grammarly (Ghufron, 2019). It helps reduce teachers' workloads (Huang et al., 2020) and promotes students' autonomy (O'Neill & Russell, 2019), because they can correctly address most of the errors flagged by Grammarly (Guo et al., 2022) and are therefore motivated to accept corrective feedback (O'Neill & Russell, 2019). It also helps them reduce grammatical errors and expand the variety of their lexical usage (Dizon & Gayed, 2021).

In the current study, the researchers used Grammarly as the primary AWCF tool, referring to it as AWCF because the findings may apply to any AWCF tool. Nevertheless, for this study, several of Grammarly's drawbacks should be taken into consideration: 1) It does not provide support on the sentence level or beyond individual sentences (Dembsey, 2017). 2) While it generates excessive feedback, it overlooks some errors (O'Neill & Russell, 2019). 3) It occasionally provides inaccurate advice (O'Neill & Russell, 2019). 4) It cannot distinguish between native speakers and L2 learners of the language (Alharbi, 2023). 5) Some students consider Grammarly's feedback challenging and even incomprehensible (Miranty & Widiati, 2021). Its feedback on grammar is often too technical and does not make

allowances for students from various backgrounds (Dembsey, 2017). Hence, Koltovskaia (2020) recommends Grammarly for students with advanced linguistic proficiency. 6) It is ineffective in improving the content and organisation of students' writing (Ghufron, 2019). Therefore, students should not rely solely on Grammarly's feedback; they should use it as a supplementary tool under the supervision of a teacher (Dodigovic & Tovmasyan, 2021). Unlike Grammarly, humans can recognise and modify ineffective approaches to support students (Dembsey, 2017).

Therefore, the current study aims to fill the gap in understanding the boundary between an AWCF tool and the teacher's role, thereby enhancing students' benefits from the feedback provided by each source. Additionally, the study underscores the importance of assisting students in using AWCF effectively in their writing. This study focuses on answering the following two main questions:

1. How does AWCF improve L2 students' writing?
2. What is the L2 teacher's role in the effective use of AWCF?

3. Methodology

The primary objective of this study was to evaluate the effectiveness of AWCF in supporting L2 learning, particularly in academic writing tasks. The research targeted undergraduate students enrolled in a Bachelor of Arts in English Language program at a public university in Saudi Arabia. This group was selected due to their active involvement in English-language academic coursework and their ongoing development as L2 writers. Data collection took place over a period of four months, from September to December 2024, and involved a purposive sample of forty students enrolled in the program. The participants were considered ideal for investigating the integration of AWCF into formal academic writing instruction within a higher education context.

To thoroughly examine the impact of AWCF on learners' writing development and perceptions, the study adopted a sequential mixed-methods design, combining both qualitative and quantitative data collection techniques. This approach provided a more holistic understanding of how AWCF influences writing outcomes and learner engagement. In the first stage (qualitative), participants were instructed to write two short essays: one describing themselves and another about their hometown. These topics were chosen for their accessibility and to allow participants to demonstrate a range of language use. Each participant submitted initial drafts without AWCF support. They were then asked to use the AWCF tool to proofread their drafts using it before submitting final versions. These before-and-after samples enabled researchers to perform a comparative textual analysis of the revisions and improvements made.

Data analysis of the two versions was conducted by comparing and contrasting the individual work of each participant before and after using the AWCF tool to detect

the discernible effects of its use. The corrective feedback provided was classified as grammatical, spelling, punctuation, and other. Table 2 presents definitions of the categories of corrective feedback with an example of each, and Table 3 shows definitions and examples of the corrective measures suggested.

Table 2. *Categories of the Corrective Feedback Provided by AWCF*

No.	Category	Definition	Example
1	Grammatical	Syntactic feedback on formation of sentences	“my car was always had problem” corrected by omitting the word “was”
2	Spelling	Orthographic feedback on correct spelling	“teachr” corrected by inserting the letter “e”
3	Punctuation	Punctuation feedback	“Saudi Arabia.Hail” corrected by inserting a one letter space after the full stop.
4	Other	Feedback that does not fall into one of the other three	“meesi” corrected the proper noun Messi by substituting it with the gerund “meeting”

Table 3. *Modifications that AWCF Applied to Each Category of Corrective Feedback*

No.	Modification	Definition	Example
1	Insertion	Recommends adding an item	“cours” corrected by adding “e”
2	Omission	Recommends a deletion	“I’m now in the fifth year of my college” corrected by omitting the word “my”
3	Transposition	Modifies the order of letters or words	“tow” corrected by transposing “o” and “w”
4	Substitution	Recommends substituting a current item with a new item	“My hobbies is” corrected by substituting “are” in place of “is”
5	Grapheme substitution	Includes more than one modification	“Sauide” corrected by omitting “i” and “e” and adding “i”

In the second stage (quantitative), participants completed a structured questionnaire designed to capture their reflections on the use of AWCF. The questionnaire was

classified into three themes: attitudes towards AWCF, the human role during the process, and the linguistic aspects of improvement resulting from AWCF. The questionnaire included closed-ended items to triangulate data with the qualitative findings. The combination of written production analysis and learner feedback allowed for a more comprehensive assessment of AWCF's pedagogical effectiveness, making the study's findings both empirically grounded and learner-informed. Ethical approval for this study was obtained from the relevant standing committee for scientific research ethics. The study's objectives were explained to the participants, and their questions were addressed before they were asked to sign a consent form. They were assured that participation was voluntary and would not interfere with their class schedules. They had the option to refuse to participate without any consequences. Data analysis focused on the effectiveness of AWCF tools for learners of L2, with particular attention to the role of these tools in enhancing their L2 learning and facilitating autonomous learning. Meticulous data analysis was conducted to achieve objective findings that represented the views of the participants.

4. Data Analysis

First Stage Data

This section discusses the four categories of corrective feedback provided by AWCF, beginning with the most frequent category and proceeding to the least frequent category. Table 4 presents a matrix of the overall data analysis comparing the categories of corrective feedback and the modifications that AWCF has applied to these categories.

Table 4 *Numeric Data of AWCF Recommendations by Feedback Category and Type*

Category	Spelling	Grammatical	Punctuation	Other	Total
Insertion	25	165	55	2	247
Omission	13	67	66	0	146
Transposition	5	1	0	0	6
Substitution	214	81	3	13	311
Grapheme substitution	8	3	1	2	14
Total	**265**	**317**	**125**	**17**	**724**

Table 4 presents numeric results by category of feedback provided by AWCF for a total of 724 instances. The most frequent category was grammatical feedback, with 317 instances. This is followed by spelling corrections totaling 265, and punctuation corrections are the third most frequent, with 125 instances. This general finding aligns with the existing literature, which suggests that AWCF's primary focus is on grammatical and lexical errors (see, for example, Alharbi, 2023; John & Woll, 2020). However, AWCF may be more effective on the grammatical aspect than on the spelling aspect (see, for example, Ghufron, 2019).

In the category of grammatical feedback, Table 4 reveals that the most common type of correction suggested was spelling substitutions (214) followed by 81 instances of grammatical substitutions and deletions totaling 67 instances. Spelling feedback is the most common type of substitution in comparison to other modifications. Based on these numbers, substitution is the most common modification suggested for spelling corrections, whereas insertion is the most common type of grammatical correction.

Categories of Corrective Feedback

Table 4 shows that grammatical feedback constituted 44% of the modifications. Then, spelling feedback constituted 37% of the modifications. These two categories account for 81% of the overall modification instances. Therefore, this section will focus on the grammatical and spelling feedback categories, with a brief discussion of the others (punctuation and other types).

Grammatical Corrective Feedback

Data analysis of the grammatical corrective feedback category indicates that AWCF mainly focused on preposition selection, article usage, and tense. Data analysis of modifications within the category of grammatical corrective feedback found the following prevalences: insertions (165), substitutions (81), omissions (67), grapheme substitution (3), and transposition (1). Instances of grapheme substitution and transposition are rare. Thus, this section will mainly focus on analysing samples from the first three types of modifications.

In the insertion type of modification, the data analysis points out that AWCF tended to focus on inserting auxiliary verbs and articles. A participant wrote: "Ha'il which located." AWCF suggested inserting the auxiliary verb "is" after the word "which." In another instance, a participant wrote: "Ha'il is major city," and AWCF highlighted the need to insert the article "a" before the word "major."

The second most common type of grammatical modification – substitution – recommended substituting erroneous elements with the correct linguistic elements. In the students' work, 81 instances suggested modifications for either the incorrect use of auxiliary verbs or errors in subject–verb agreement, such as the incorrect use

of the auxiliary verb "have" with singular subjects instead of "has," as in "Ha'il city have..." Furthermore, AWCF found inappropriate use of prepositions. For example, one participant wrote, "I was born in the 26th…", and AWCF suggested substituting "in" with "on." This affords good practice on nuanced grammatical elements, such as prepositions and articles, as these are often challenging for non-native speakers.

The third most common suggestion in the category of grammatical feedback was to delete unnecessary elements. In this modification, students using wording such as "to talk about my city in fact I am a resident," were advised to remove the superfluous element "in fact." Another example was when a student wrote "a nice people," and AWCF suggested omitting the article "a." This is useful in enhancing students' awareness of awkward or fragmented sentences to be avoided.

Data analysis of the grammatical feedback category pointed out that AWCF was helpful in identifying and suggesting appropriate corrections of errors in syntax. This is in line with Miranty and Widiati's (2021) assertion that AWCF acts not only as a corrective feedback tool but also as an essential tool for L2 education.

Spelling Corrective Feedback

Corrective feedback regarding spelling was the second most common type. As shown in Table 4, the frequency of feedback types in the spelling category were substitutions (214), insertions (25), omissions (13), grapheme substitutions (8), and transpositions (5). This section focuses on analysing samples of substitutions because the numbers of the remaining types of modifications were insignificant.

Data analysis of substitution suggestions revealed that AWCF effectively recommended modifications that improved the participants' work by removing incorrect spelling and highlighting incorrect capitalisation, the most common of which was failing to capitalise proper nouns. AWCF correctly recognised uncommon proper nouns. For example, a participant wrote the names of two main landmarks in the Ha'il region of Saudi Arabia as follows: "Aja and salma mountains." AWCF identified both non-English words, "Aja" and "Salma," as proper nouns and suggested capitalising them, although they are local landmarks unfamiliar to most non-native people. It is possible that AWCF suggested capitalising the word "Salma" because AWCF connected the two proper nouns with the noun mountain and noted that the student had capitalised the proper noun "Aja." However, the participants seemed to reject some suggested modifications. This finding supports Koltovskaia's (2020) comment that AWCF users reject some suggested modifications. For example, the proper noun of the city "Ha'il" was highlighted by AWCF, but the participants did not modify it. The participants were likely aware that the affected word refers to a proper name, which is the name of their hometown. These are example of participants not accepting AWCF modifications that they knew to be incorrect. These participants were aware that not

all suggestions were correct, so they wisely proofread the modifications before incorporating them. This is supported by Ranalli's (2021) discovery that students tend to proofread and correct AWCF suggestions.

Data Analysis of Second Stage Data

The second stage of data analysis involved data collected from the questionnaire and focused on three themes: the participants' attitudes towards AWCF, the role of humans in AWCF processing, and linguistic improvements that can be attributed to the use of AWCF.

1. *Participants' Attitudes Towards AWCF*

Figure 1 below illustrates the participants' perspectives on the effectiveness of AWCF in improving their writing skills. The vast majority of the participants (95%) agreed that AWCF positively influenced their writing skills. This supports Zhang's (2020) observation that AWCF improves students' learning experiences.

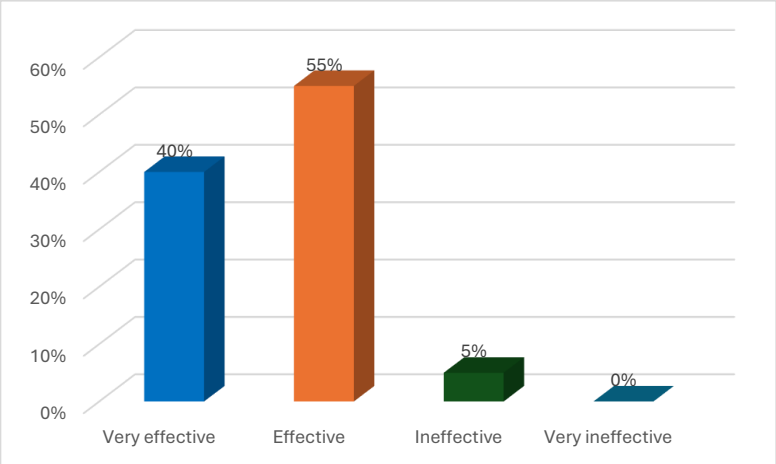


Figure 1. *How effective do you find automated corrective feedback tools in improving your writing skills?*

Figure 2 depicts the level of participants' satisfaction with the feedback provided by AWCF, indicating that 95% of participants were satisfied with AWCF feedback. Similarly, Lim and Phua (2019) asserted that students have positive attitudes towards AWCF. This finding suggests that students may not require purposeful motivation to use AWCF tools, although they will likely need training sessions on their use.

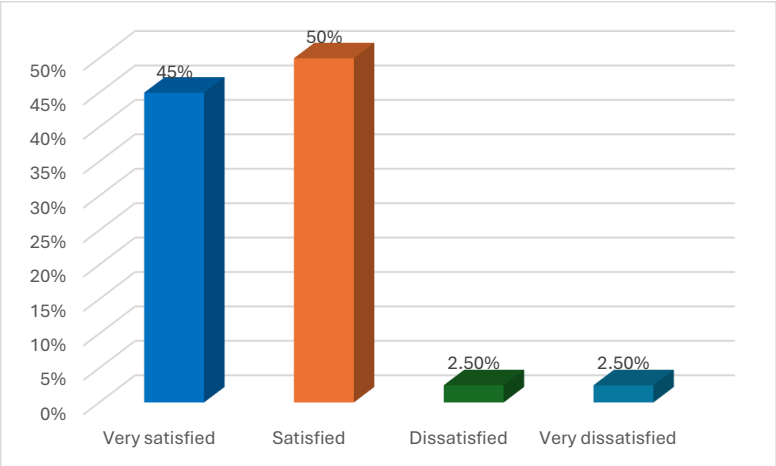


Figure 2. *How satisfied are you with the feedback provided by automated tools?*

Figure 3 demonstrates participants' trust in AWCF, finding that 62.5% of the participants reported that they mostly trust the suggestions provided by AWCF. Students' trust in AWCF is a core element in their dealings with it (see, for example, Ranalli, 2021).

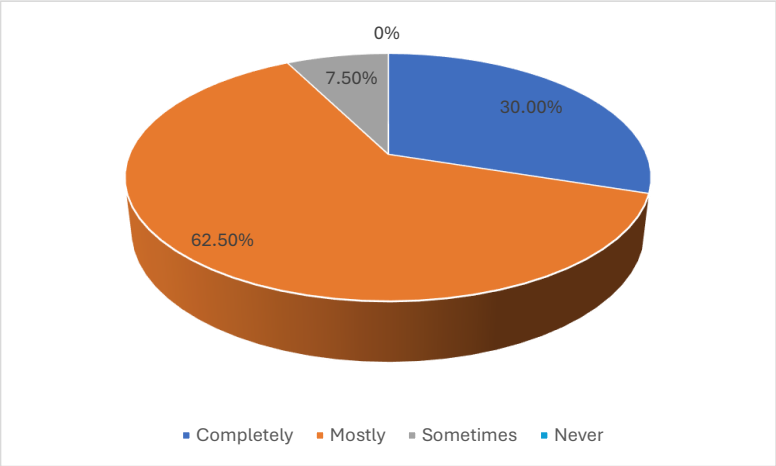


Figure 3. *How much do you trust the corrections suggested by automated tools?*

Figure 4 shows the participants' ranking of their main reasons for using AWCF and reflects that 47.5% of them ranked convenience first, while 57.5% of them ranked

speed as very important. This supports Koltovskaia's (2020) finding that AWCF's speed is notably beneficial.

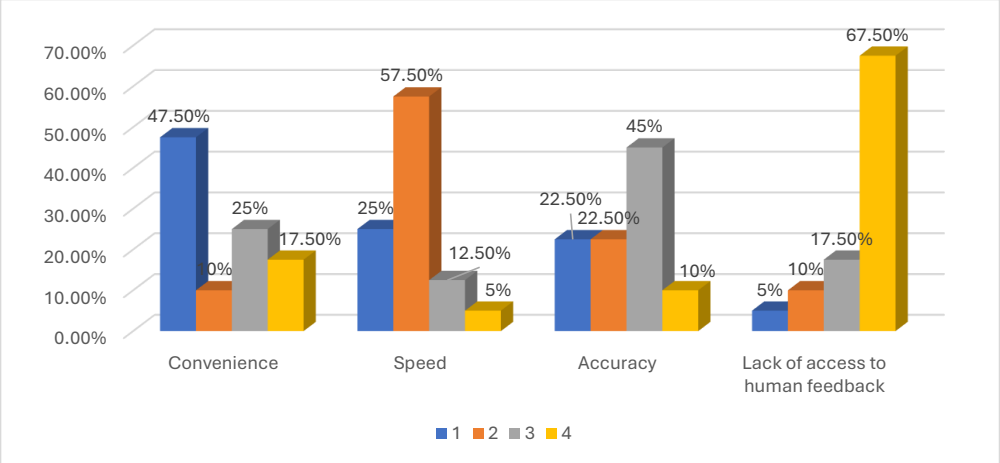


Figure 4. *Rank your main reasons for using automated corrective feedback (Number 1 represents the most important reason, and Number 4 is the least important reason)*

2. Human Role in the AWCF Process

The second theme of data analysis of the questionnaire focused on the human role during the AWCF process. In Figure 5, the role of AWCF in assisting the participants to become independent writers was evaluated. Figure 5 indicates that the vast majority of participants (90%) agreed that AWCF had assisted them in becoming independent writers. This finding is in line with Barrot (2023) and O'Neill and Russell's (2019) conclusion that AWCF improves students' autonomous learning.

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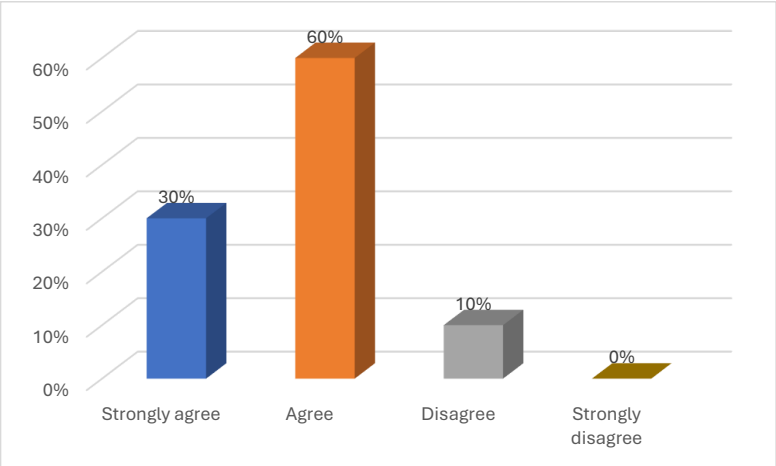


Figure 5. *Do you agree that automated corrective feedback has made you a more independent writer?*

Figure 6 reflects participants' attitudes towards whether AWCF could replace human corrective feedback. Results indicate that most participants (57.5%) were unconvinced that AWCF could replace human corrective feedback. This supports the literature recommending that AWCF be used as a complement to teachers' feedback (see, for example, Al Ghaithi & Behforouz, 2025; Link et al., 2022; Woodworth & Barkaoui, 2020).

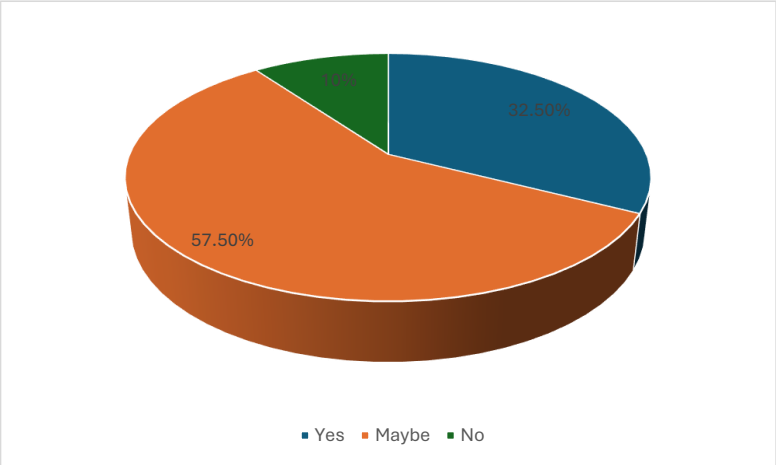


Figure 6. *Do you believe that automated corrective feedback can replace human feedback?*

3. Linguistic Improvements that Can Be Attributed to the Use of AWCF

For the data in Figure 7, participants were asked to indicate all aspects in which AWCF has assisted in improving their writing skills. Fully 70% of the participants asserted that AWCF improved the grammatical aspects of their writing, whereas 57.50% indicated that AWCF had improved their spelling.

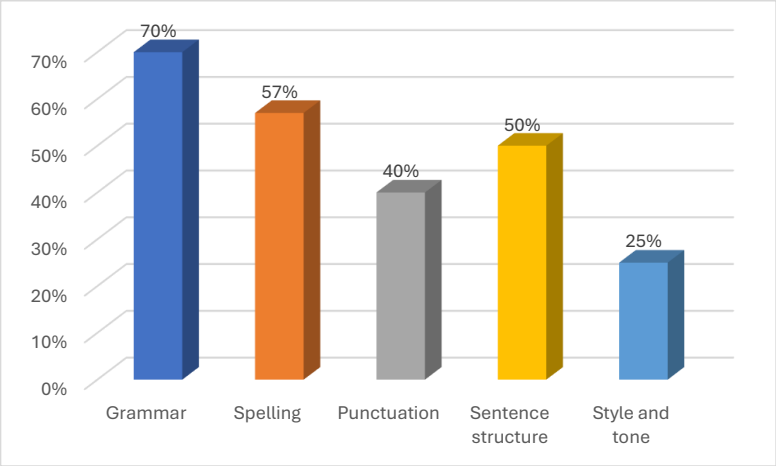


Figure 7. *What aspects of your writing have improved the most due to automated corrective feedback?*

5. Discussion and Conclusion

In answer to the first question of this study, the findings revealed that AWCF is effective in improving participants' engagement with their writing, as well as their self-monitoring and self-evaluation of their work (see, for example, Barrot, 2023; Zhang, 2020). AWCF accurately modified most of the incorrect items and provided appropriate substitutions for grammatical errors, including verb forms and possessive forms. This finding supports Barrot's (2023) assertion that such suggested modifications assist EFL students in improving the level of their grammatical competence. This aligns with Shintani's (2016) observation that students' use of AWCF tools leads to improved coherent and accurate writing.

AWCF contributed to enhancing the participants' writing proficiency by offering correct spelling modifications in most instances. However, the participants displayed a cautious approach to the spelling category. They critically evaluated AWCF's recommendations, particularly when dealing with local proper nouns. The findings from both stages of data analysis revealed that the participants actively engaged with AWCF, demonstrating critical thinking by proofreading AWCF's

suggested modifications. The participants may have noted that AWCF occasionally provided contextually inappropriate feedback, highlighting the importance of understanding the broader context of the text before accepting the recommended modifications. The participants' critical evaluation of AWCF indicated a growing opportunity for autonomous learning of L2 writing skills.

In the second stage of data analysis, the participants reported that grammar was the most significant linguistic aspect in which AWCF provided assistance, followed by spelling. This finding supports the results from the first stage of data analysis, in which the grammatical corrective feedback category recorded the highest number of modifications by AWCF, and spelling corrective feedback was the second most frequent category.

To answer the second question of this study, the majority of the participants expressed trust in AWCF (see Fig. 3), which was reflected in the number of modifications made to their written work (see Table 4). However, the findings also revealed a few limitations to AWCF's capabilities. First, there were instances of clear errors that AWCF did not flag. Second, AWCF cannot entirely replace the nuanced understanding and guidance provided by human corrective feedback. Instructors play a vital role in identifying errors that AWCF tools fail to detect and have the ability to foster students' critical thinking and writing skills. These findings underscore the continued importance of instructor involvement in complementing AWCF and guiding students in critically interpreting AWCF suggestions.

AWCF is unable to distinguish between substantive and superficial errors. Therefore, some of it suggested modifications may have already been familiar to the participants. This study did not fully consider the complementary role of instructors in conjunction with AWCF. Future research could explore the impact of integrating AWCF with instructors' corrective feedback on students' long-term writing development.

Declarations

Availability of data and material

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request. Collection of data has been approved by Ethical Approval of Scientific Research (REC), and it has the approval number: H-2024-402.

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