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The Impact of AI-Based Corrective Feedback on Students' Writing Motivation

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ABSTRACT

The goal of this study is to bridge this literary gap and see if AI-based corrective feedback has an impact on the writing motivation of students. This study was built upon Deci and Ryan's Self-determination Theory of motivation. The mixed-methods approach – Explanatory sequential was used to analyze the results of this study. The quantitative data were obtained from the survey questionnaire, while the qualitative data were obtained based on thematic analysis from a focus group discussion. A total of 28 Senior High School students participated in the study. Results showed that AI-based corrective feedback positively impacts writing motivation. Moreover, the respondents perceived that AI-based corrective feedback reinforces writing motivation through learner autonomy, learner competence, and learner social connection. Meanwhile, themes such as increased error awareness, immediate corrective feedback, Improvement in writing, less teacher apprehension, and a boost of confidence were prominently observed in the focus group discussion.

Keywords: AI-based corrective feedback, grammar checkers, writing motivation, learner autonomy, learner competence

INTRODUCTION

Artificial intelligence (AI) integration in education has been increasingly prevalent in the 21st century, ranging from robotics to app development and even grammar checkers (Pantelimon et al., 2021; Wang & Han, 2022). AI-based software, such as grammar checkers, has increased significantly since the COVID-19 pandemic lockdowns, during which teacher interactions and feedback were limited (Pantelimon et al., 2021; Wang & Han, 2022). Despite the insufficiency of AI-based grammar checkers in

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providing 100% accuracy, students received several benefits through their integration into the writing classroom. These benefits include promoting learner autonomy and motivation, reinforcing sustained learner motivation through self-regulated learning, and providing immediate feedback that allows students to revise and rewrite their work until they achieve a satisfactory score. However, it is essential to note that automated feedback should be considered a supplement rather than replace teacher input (Dodigovic & Tovmasyan, 2021; O'Neill & Rusell, 2019; Woodworth & Barkaoui, 2020).

Numerous studies have assessed and evaluated the utility and accuracy of different AI-based automated feedback systems (Dizon & Gayed, 2021; John & Woll, 2020; Moon, 2021; Park, 2019a; Park, 2019b; Yang, 2018). While current improvements in AI-based grammar checkers are not yet sufficiently accurate, the accessibility of these tools outside the classroom promotes the value of individual and independent learning (Pantelimon et al., 2021; Wang & Han, 2022).

Khoshnevisan (2019) also argued that AI-based grammar checkers have increased students' self-confidence in writing and submitting their essays. One contributing factor is that the automatic writing evaluation system reduces student writing apprehension (Waer, 2021). Teachers can avoid adverse effects or emotions, such as discouragement and embarrassment, from their feedback or apprehension by properly regulating and communicating them (Frontiers, 2022; Seidlitz Education, 2020; Edutopia, 2021).

The topic of AI-based corrective feedback has yet to be substantially investigated, and little research has been conducted on the direct link between AI-based corrective feedback and student writing motivation (Sage Journals, 2023; ResearchGate, 2023). Recent studies have only examined the accuracy and usefulness of various grammar checkers (Zapier, 2023). However, researchers have acknowledged the role of Automated Written Evaluation (AWE) in enhancing students' writing and motivating them (PDF, 2022).

This study is anchored on the Self-determination theory developed by Deci and Ryan (2000), which purports that human beings' intrinsic drive and ability to control their own conduct are linked to satisfying their demands for autonomy, competence, and social connection (Hu & Zhang, 2017). According to Holec (1981, as cited in Hu & Zhang, 2017), "autonomous learners assumed responsibility for determining the purpose, content, rhythm, and method of their learning, monitoring its progress, and evaluating its outcomes."

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According to De Smedt et al. (2020), the need for autonomy is a sense of being in charge of one's own actions and taking pride in them, while the need for competence means feeling like you're in charge and knowing you can succeed. To give further context, Wang et al. (2013, as cited in Fan & Ma, 2022) claim that feedback from an automated writing evaluation system allowed students to be more responsible for their writing completion and take charge of most parts of their revision. Therefore, allowing learners to become autonomous in their learning. On the other hand, Taskiran and Goksel (2022) found that AI-based corrective feedback can reinforce sustained learner motivation through self-regulated learning. This means that even though automated feedback provides suggestions or recommendations for revision, it is still the learner's responsibility to determine whether the suggestions are appropriate, thus instilling a sense of competence in the learners.

The study adopted a mixed-methods-Explanatory sequential design that utilized a convergent parallel approach. The researcher conducted four writing sessions using two AI-based grammar checkers as exposure to the technology and a preliminary step in the data collection process. After the writing sessions, the researcher distributed a questionnaire to determine the students' perception of AI-based corrective feedback. A focus group discussion was conducted with selected respondents to extract qualitative data to validate and contextualize the survey results. The questionnaire was addressed to the respondents using the convenience sampling technique. The Centro Escolar University Institutional Review Ethics Board (CEU IERB) reviewed the ethical considerations of this study. At the same time, the professors, who are experts in research and English language teaching, validated the questionnaire and interview guide.

This research will give teachers, future researchers, and schools insights into the possible impact of integrating AI-based corrective feedback inside the writing classroom. While little research has been done linking the said AI technology to students' writing motivation, the results of this study showed promising benefits to students' motivation, thus further supporting prior conclusions from previous studies.

METHODS

Research Design

This study utilized a mixed-methods design, specifically descriptive qualitative and quantitative designs. The study made use of descriptive research as it also uncovered and described the learners' writing motivation and perspectives toward the use of AI-Based corrective feedback as reinforcement of learner competence, autonomy, and social connections.

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According to Creswell and Clark (2017), a mixed methods research design is a procedure for collecting, analyzing, and "mixing" both quantitative and qualitative research and methods in a single study to understand a research problem. In this study, the use of the quantitative method provided numerical data as to the perception of students towards AI-based corrective feedback in terms of autonomy, competence, and social connection. The intent of adding qualitative data to this study is to provide personal, contextual, and qualitative experiences drawn from the participants' exposure to AI-based corrective feedback.

Participants/Respondents of the Study

As part of the degree requirement for the Bachelor of Secondary Education, the researcher was deployed to Centro Escolar Integrated School (CEIS) Manila for teacher training or internship. The researcher handled English classes in the said laboratory school. For this matter, non-probability Convenience sampling was used in this study. A non-probability Convenience sampling technique (also known as incidental sampling or grab sampling) is a sampling technique in which researchers select samples based on proximity (Simkus, 2023). Given the opportunity to have access to a whole class of Senior High School students, the researcher conducted the writing sessions with the guidance of a cooperating teacher and the permission of the school head. As mentioned, the study was conducted at Centro Escolar Integrated School (CEIS) Manila during the second semester of the school year 2022-2023. The participants in this study are enrolled in one class. The class consisted of 33 Senior High School students from Grade 11 HUMSS CEIS Manila. However, only 28 of the students participated in the survey, and 14 out of the 28 students were selected for the Focus Group Discussion. Respondents were then divided into 2 groups: group Grammarly and group Quillbot. Both groups consisted of 14 participants. For the focus group discussion, seven respondents out of each group participated. Parent consent forms were also provided to the participants, as the majority of the respondents fall under the minor age group (16 to 17 years old).

Instruments of the Study

The following were used in the conduct of the research:

1. *Survey questionnaire.* The first section comprises questions on the students' perceptions of AI-based corrective feedback as a motivational reinforcement in terms of learner autonomy, competence, and social connection (Ryan & Deci 2000, as cited in Hu & Zhang, 2017). This particular part of the research questionnaire is adapted from Lazic et al. (2020) and SQR-academic writing motivation (De Smedt et al., 2018). Revisions and modifications were made to the adapted questionnaire to tailor-fit to the current study. The aim of the questionnaire is to provide insight into the perception of students towards AI-based corrective feedback using a Likert-scale type of

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survey. It was measured using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Meanwhile, the second part of the questionnaire focused on the extent to which AI-based corrective feedback impacts student writing motivation. The questionnaire was measured using a 5-point Likert scale, ranging from 1 (to no extent) to 5 (to a very large extent).

2. I*nterview Guide.* The second instrument consisted of focus group discussion questions that were patterned after the Statement of the Problem. Follow-up questions were asked to validate the respondents' answers from the survey questionnaire to ensure that the results and findings were aligned with the aims of the study.

Three experts in the field of languages validated the instruments. All of whom are affiliated with and employed at Centro Escolar University. The survey questionnaire was subjected to a dry run and reliability testing. Twenty-seven (27) responses were collected and recorded in the reliability test. For this specific research instrument, a Cronbach's alpha of 0.8 or higher was considered reliable. The result of the test garnered the following values for each variable being measured:

Table 1.
Summary of Alpha Values

Variable	Alpha Value	Interpretation
Learner Autonomy	0.81	Reliable
Learner Competence	0.83	Reliable
Learner Social Connection	0.82	Reliable
The extent of the impact AI-based corrective feedback has on students writing motivation.	0.85	Reliable

The reliability test showed that all components of the survey questionnaire are reliable.

Data Collection and Analysis
The following steps were taken in the process of data gathering for this study:

1. *Approval from the CEU Institutional Ethics Review Board (IERB) and permission from the CEIS Manila Assistant Principal.* The thesis proposal for the study was submitted to the CEU IERB for review and

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approval. A copy of the proposal and letter seeking permission to conduct a study was sent to the CEIS Manila School Assistant Principal.

2. *Guided freewriting/ Exposure to an AI-based Grammar checker* The respondents were divided into two groups corresponding to the number of AI Grammar checkers used: Grammarly and Quillbot.

Table 2.
Summary of Number of Respondents for Each Group

Grammar Checker	No. of Respondents
Quillbot	14 Respondents
Grammarly	14 Respondents

For accessibility purposes, the researcher used basic accounts for both programs. "Guided freewriting" was the writing task for this study, as it has been shown to help students write more fluently (Hwang, 2010). A total of two writing tasks within a four-session writing activity were administered in a week's time. All the sessions were integrated into the "motivation and assignment activities" of the researcher to cater to the student's time and availability. All the writing tasks required students to write an approximately 150-word English essay. Table 3 shows the summary of the writing sessions.

Table 3.
Summary of "Guided Freewriting" Sessions

Session 1	Session 2	Session 3	Session 4
Students will complete the draft of their essays (1st writing task) Topic 1: "My thoughts about Electronic literature"	Students will revise their essays using the AI grammar checker for corrective feedback.	Students will complete the draft of their essays (2nd writing task) Topic 2: "My 21st Century writing interest"	Students will revise their essays using the AI grammar checker for corrective feedback.

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3. *Survey questionnaire.* The survey questionnaire was administered after the "guided freewriting" activity. The first part of the questionnaire revolved around the three motivational components proposed by Ryan and Deci (2000) which are the following: autonomy, competence, and social connection. The second part of the questionnaire focused on measuring the extent to which AI-based corrective feedback impacts student writing motivation.

4. *Focus group discussion.* After the survey, 14 selected students were asked to join a focus group discussion. Seven (7) selected participants came from Group Grammarly and the other seven (7) were from Group Quillbot. The purpose of the Focus Group Discussion is to dig deeper into the factors that AI-based corrective feedback has that may affect their writing motivation, drawing from their experience in the exposure. The structured interview gave justification and provided more context for the respondents' answers to the survey questionnaire.

5. *Data Analysis Plan.* For research questions 1 and 2, descriptive statistics were used to compute the arithmetic mean. To determine the verbal interpretation of the weighted mean, the following range was considered: 0 to 1.50=Strongly Disagree/To no extent, 1.51 to 2.50=Disagree/To a small extent, 2.51 to 3.50=Neutral/To some extent, 3.51 to 4.50=Agree/To a large extent, and 4.51 to 5=Strongly Agree/To a very large extent. Meanwhile, for research question 3, a thematic analysis of the student responses to the focus-group discussion was used to analyze and interpret the qualitative data.

RESULTS AND DISCUSSIONS

This section provides the presentation, analysis, and interpretation of data from the results of the survey and focus group discussion. The following data are presented following the specific research questions stated in the statement of the problem.

1. **The students' perception of AI-Based Corrective Feedback as a source of motivation in terms of:**
    - **1.1. Learner Autonomy;**
    - **1.2. Learner Competence; and**
    - **1.3. Learner Social Connection.**

The Weighted Mean (WM) is an average computed by giving different weights to the individual values. It is noted in the survey that 5=Strongly Agree, 4=Agree, 3=Neutral, 2=Disagree, and 1=Strongly Disagree. To determine the verbal interpretation for each statement, the following

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range was considered: 0 to 1.50=Strongly disagree, 1.51 to 2.50=Disagree, 2.51 to 3.50=Neutral, 3.51 to 4.50=Agree, and 4.51 to 5=Strongly Agree.

Table 4.
The students' perception of AI-Based Corrective Feedback as a source of motivation in terms of Learner Autonomy.

Learner Autonomy Statements	***WM***	***VI***
1. I am encouraged to write on my own because of the AI Grammar Checker's Feedback.	4.25	Agree
2. I feel in charge of my writing output when I use the feedback from the AI Grammar Checker.	4.33	Agree
3. Writing is fascinating using AI Grammar Checker.	4.24	Agree
4. I know how to revise my essay based on AI Grammar Checker's feedback.	4.35	Agree
5. I am confident that I can write more in the future with the help of AI Grammar Checker.	4.08	Agree
6. I can be productive with the help of an AI Grammar Checker.	4.25	Agree
7. Rewriting after receiving the AI Grammar Checker feedback motivated me to continue writing.	3.92	Agree
8. I complete writing assignments knowing AI Grammar Checker is at hand.	4.08	Agree
9. AI Grammar Checker is useful when I write.	4.19	Agree
10. I am excited to do writing tasks with the AI Grammar checker at hand.	4.33	Agree
Mean	**4.20**	**Agree**

Table 4 shows the weighted mean of each statement pertaining to learner autonomy. Students were asked whether they agree or not agree with each statement that probed their perception of AI-Based Corrective Feedback as a source of motivation in terms of Learner Autonomy. Statement 4 (*I know how to revise my essay based on the AI Grammar*

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Checker's feedback) got the highest weighted mean of 4.35=Agree. Meanwhile, the lowest got 3.92=Agree (*Statement 7, Rewriting after receiving the AI Grammar Checker feedback motivated me to continue writing).* The overall mean showed a total of 4.20 which translates into "Agree". Therefore, the respondents "Agree" that AI-Based Corrective Feedback reinforces writing motivation in terms of Learner Autonomy.

Table 5.
The students' perception of AI-Based Corrective Feedback as a source of motivation in terms of Learner Competence.

Learner Competence Statements	***WM***	***VI***
1. The AI Grammar Checker's feedback made me feel more confident about handing in my essays.	4.23	Agree
2. I am motivated to write because the AI Grammar Checker developed my language long-term as I could understand grammar more.	4.47	Agree
3. I am motivated to write because the AI Grammar Checker enhanced my paraphrasing skills.	4.48	Agree
4. I am motivated to write because the AI Grammar Checker enhanced my summarizing skills.	4.87	Strongly Agree
5. I am motivated to write because the AI Grammar Checker enhanced my synthesizing skills.	4.63	Strongly Agree
6. When using the AI Grammar Checker, I read extended explanations of errors.	4.33	Agree
7. 'Correctness' from the AI Grammar Checker alerts is useful.	4.16	Agree
8. I am more knowledgeable with the help of the AI Grammar Checker.	4.08	Agree
9. I no longer commit the same error with the help of AI Grammar Checker's corrective feedback.	4.02	Agree
10. I can further expound on my ideas clearly with the use of an AI Grammar Checker.	4.33	Agree
Mean	**4.35**	**Agree**

Table 5 demonstrated an overall Weighted Mean of 4.35=Agree for statements pertaining to Learner Competence. Statement 4 *(I am*

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motivated to write because the AI Grammar Checker enhanced my summarizing skills) got the highest weighted Mean of 4.87=Strongly Agree. The statement with the lowest weighted mean is statement 9 *(I no longer commit the same error with the help of AI Grammar Checker's corrective feedback)* with a weighted mean of 4.02=Agree. This means that respondents "Agree" that AI-Based Corrective Feedback also reinforces motivation in terms of Learner Competence.

Table 6.
The students' perception of AI-Based Corrective Feedback as a source of motivation in terms of Learner Social Connection.

Learner Social Connection Statements	***WM***	***VI***
1. I can express my thoughts to others with the help of AI Grammar Checker's corrective feedback.	4.23	Agree
2. I no longer feel ashamed of sharing my opinions through writing with the help of AI Grammar Checker's corrective feedback.	4.47	Agree
3. I am assured that my writings are error-free when I share them with others.	4.48	Agree
4. I am relieved to have corrected my mistakes before submitting my essay with the help of AI Grammar Checker's corrective feedback.	4.87	Strongly Agree
5. I can connect better with others through written conversation with the help of AI-based corrective feedback.	4.63	Strongly Agree
6. I am at ease when I review my essay with AI Grammar Checker before submitting it.	4.33	Agree
7. I can engage in written conversations better when using AI-based corrective feedback.	4.16	Agree
8. I can expound on my ideas for others to understand using AI-based corrective feedback.	4.08	Agree
9. With the use of AI-based corrective feedback, I can make coherent and precise sentences to express my thoughts to the teacher in my essay.	4.02	Agree

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10. I feel competent and ready to present my essay with the help of AI-based corrective feedback.	4.33	Agree
Mean	**4.35**	**Agree**

Table 6 shows that the lowest weighted mean for social connection is 4.02=Agree (*Statement 9. highest: With the use of AI-based corrective feedback, I can make coherent and precise sentences to express my thoughts to the teacher in my essay*). The overall weighted mean for this table is 4.35 which means that the respondents "Agree" that the social connection aspect or benefits from AI-based corrective feedback reinforce their writing motivation.

2. The impact of AI-based corrective feedback on students' writing motivation.

Table 7 shows the weighted mean of students' levels of extent on the positive impact of AI-based corrective feedback on their writing motivation. To determine the verbal interpretation for each statement, the following range was considered: 0 to 1.50=To no extent, 1.51 to 2.50=To a small extent, 2.51 to 3.50=To some extent, 3.51 to 4.50=To a large extent, and 4.51 to 5=To a very large extent.

Table 7. The *extent of the Impact of AI-based corrective feedback on students' writing motivation*

Statements	***WM***	***VI***
1. The feedback from the AI-based Grammar Checker has positively affected my writing motivation.	4.56	To a very large extent
2. The feedback from the AI-based Grammar Checker positively improved how I approach writing.	3.75	To a large extent
3. The feedback from the AI-based Grammar Checker increased my self-confidence.	4.32	To a large extent
4. The corrective feedback from the AI-based Grammar Checker improved my understanding of English grammar.	4.12	To a large extent

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5. The feedback from the AI-based Grammar Checker boosts my self-esteem when communicating with others.	4.22	To a large extent
6. The corrective feedback from the AI-based Grammar Checker helped me get my point across.	4.67	To a very large extent
7. The corrective feedback from the AI-based Grammar Checker increased my awareness of my grammar errors.	4.35	To a large extent
8. The corrective feedback from the AI-based Grammar Checker improved how I view writing.	3.78	To a large extent
9. The corrective feedback from the AI-based Grammar Checker positively contributed to my productivity.	4.23	To a large extent
10. The corrective feedback from the AI-based Grammar Checker developed my content writing.	3.84	To a large extent
Mean	**4.23**	**To a large Extent**

Table 7 shows the weighted mean of students' levels of extent on the positive impact of AI-based corrective feedback. The overall weighted mean of the students' responses is 4.23, which can be interpreted as "To a large extent". Therefore, AI-based corrective feedback positively impacts their academic writing skills to a large extent.

3. Themes from the participants' experiences and their attitudes toward AI-based corrective feedback.

For research question 3, thematic analysis was used to consolidate the participants' responses to the interview questions for the Focus Group Discussion. The questions are particularly focused on validating their responses to the survey questionnaire and are aligned with the Statement of the Problem. Thus, the themes were divided into sections in accordance with the respective components of the research survey.

3.1. Learner Autonomy

According to Deci and Ryan (2000), autonomy refers to the learner's capability to take responsibility for his or her own learning. In the context of this study, it means that the learners should have the ability to be autonomous with what and how they write. The following

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themes emerged when students were asked about their autonomy in using an AI-based grammar checker.

3.1.1. Students' self-evaluation in writing

According to the respondents, AI-based corrective feedback encourages self-evaluation in writing. Participant 1 said that *"I want to know what are the mistakes and weaknesses in my writing"*. With immediate corrective feedback from the software, students can immediately see corrections as well as explanations for their errors. This supports the finding of Benali (2021) which suggests that AI-based corrective feedback promotes learner autonomy and motivation (Benali, 2021)

3.1.2. Offers objective feedback

Participant 8 mentioned that "*it was easier to revise my writing without being judged"*. Since AI-based grammar checkers are programmed with updated grammar rules, students can objectively assess their writing and edit as necessary.

3.1.3. Boost of Productivity

Grammarly's spell check has a high accuracy rate, perhaps the best available, according to the respondents. It can also scan an entire document for any cases of plagiarism, intentional or unintentional. Participant 6 said, *"I can focus more on the content rather than worrying about rules or unintentional plagiarism."*

3.2. Learner Competence

In Self-Determination theory, viewing oneself as competent adds to the intrinsic motivation to accomplish any activity. In the study, students were asked whether AI-based corrective feedback adds to how they view themselves as competent students. The following are the common themes that were noticeable during the interview.

3.2.1. Extra level of assurance

Participant 11 said that *"I often doubt myself whether my grammar is right or wrong. I trust the feedback (AI-corrective feedback)"*. Khoshnevisan (2019) also argued that AI-based grammar checkers have been shown to increase students' self-confidence in writing and submitting their essays. Adding the AI-based grammar checker to the writing process gives students formative and summative feedback that allows them to have several drafts, which can improve their self-awareness of their errors and thus improve their writing quality (Chen & Cheng, 2008, as cited in Benali, 2021)

3.2.2. A refresher on grammar rules

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Participants using Grammarly stated that *"Grammarly provided us with concrete explanation of the errors even with the basic account*". However, respondents using Quillbot reported frustration with the little coverage of the Grammar checker, as it was originally specialized in AI paraphrasing, not grammar checking. Nonetheless, Quillbot provided them with a refresher on the rules of punctuation and subject-verb agreement.

3.2.3. Improvement in writing

Participant 11 stated that *"I feel the improvement in terms of making sentences, therefore, now I think I write a paragraph in a more good and clear sentence".* It is emphasized that the nature of immediate automated feedback has been shown to improve students' writing quality (Benali, 2021).

3.3. Learner Social Connection

The three components of Self-determination are autonomy, competence, and social connection (Deci & Ryan, 2000). Social connection is an integral part of motivating students. Having the ability to positively connect with others in a way that instills the spirit of belongingness and acceptance can reinforce motivation. In this section, students were asked about how AI-based corrective feedback reinforces student motivation to write through Social Connection. The following are the recurring themes from the interview.

3.3.1. No unnecessary comments or negative feedback

Participant 13 mentioned that *"I prefer to receive feedback from AI for initial submission of my paper"*. As established in this study, corrective feedback can break or make students. For this matter, students shield themselves from embarrassment through the corrective feedback they receive from an AI-based grammar checker.

3.3.2. Less nervous apprehensions from teachers.

"I am afraid of making mistakes when writing because of previous trauma from a teacher. With grammar checkers, I can correct my mistakes before handing them over" -Participant 9.

The contributing factor to the increase in students' self-confidence in writing and submitting their essays is that the automatic writing evaluation system reduces student writing apprehension (Waer, 2021). This entails that the negative effects or emotions, such as discouragement and embarrassment, from a teacher's feedback or apprehension can be avoided.

3.3.3. Boost of Confidence in Social Media Posts

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"With the assurance from Grammarly, I tend to be less anxious about my grammar when I post captions of my photos online" -Participant 2.

The use of AI-powered grammar software has made its customers' lives easier by offering services such as corrective feedback, recommendations for grammatical difficulties, paraphrasing ideas, and so on.

3.4. Positive and Negative Impacts of AI-based Corrective Feedback

3.4.1. Positive Impact of AI-based Corrective Feedback

3.4.1.1. Convenient to use

Participant 5 stated that *"Grammar checkers can now be integrated in GDocs, MS Word, and mobile phones."*. With the development of technology and its ecosystem, it is easier to navigate and access AI-based software.

3.4.1.2. Gives remedial practice with the learner's own errors

Participant 2 said that "it is easier to understand [grammar] rules while using AI-based grammar checkers". Students received proficiency scores as a result of the feedback from the AI-based grammar checkers. This initial marking of their written output serves as a basis for them to revise and rewrite their work until they can achieve a satisfactory score. This process of revising and rewriting gives students more opportunities to practice, therefore allowing them to improve their writing capabilities (Fan & Ma, 2022).

3.4.1.3. Gives immediate feedback

"I get to have suggestions on how to change my sentences in better way. It also allowed me to explore other words" -Participant 10.

The ability or feature of the automated feedback to offer synonym suggestions improved students' writing performance (Wang & Han, 2022). This could imply that this feature aided in the enrichment of the learners' vocabularies.

3.4.1.4. A positive way of embracing technology

"I think that mas okay na lang na naka-integrate na yung grammar checkers. Kasi ganon din naman gagamitin din naman ng mga estudyante sa labas. Mas better na alam ng teachers." - Participant 7

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Translation: I think that it is okay to integrate Grammar Checkers in the writing classroom. Students will still use the technology outside anyway. It is better that the teachers are aware.

Godwin-Jones (2022) stated that with the rapid development of AI, teachers, and students are likely to co-create with algorithmic systems. Development in technology cannot be avoided and should be explored and assessed for a better utility that positively benefits the learning process (p.17).

3.4.2. Negative Impact of AI-based Corrective Feedback

3.4.2.1. Development of negative dependency on grammar checkers

Participant 9 stated that *"I feel uneasy when I have to submit physical written works because I don't feel as confident as submitting with Grammarly."* Students have the tendency to rely too much on technological aids.

CONCLUSIONS

Based on the foregoing findings, the following conclusions were drawn:

1. Learners demonstrate an increased awareness of autonomy when utilizing AI-based grammar checking tools.
2. Immediate error detection through AI-generated feedback helps foster a sense of competence among users.
3. AI corrective feedback encourages users to engage in self-revision and proofreading, promoting more careful and reflective writing practices.
4. The use of AI-based grammar checkers can help reduce anxiety related to receiving negative or discouraging feedback.
5. AI-driven corrective feedback supports the overall development of writing skills.
6. Such feedback positively influences writing motivation by enhancing learners' sense of autonomy and competence, while also mitigating the impact of negative social feedback from teachers, peers, or online critics.

RECOMMENDATIONS

To the teachers:

- AI-based Grammar Checkers can be used as a diagnostic tool for grammar lesson intervention or any English language class.

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- Teachers should use AI-based grammar checkers as a tool for Grammar enhancement activities.
- Teachers should devise activities using AI-based grammar checkers where students can read and list extensive explanations of their errors to prevent negative dependency on the technology.
- In implementing an AI-based grammar checker in the classroom, teachers should be able to familiarize themselves with some misleading or inappropriate error prompts.

To the schools/colleges/universities:

- Integration of AI-based Grammar Checkers can be beneficial to students as they only provide corrective feedback and revision suggestions. They work more like an editor than an AI writer.

To future researchers:

- The study utilized an exposure method to draw data from experience. For future research, consider taking the Experimental approach where there is a control group to ensure that the observed results are not just random events.
- Consider taking an in-depth look into the premium features of AI-based grammar checkers and if this has a correlation to the level of motivation of students.
- Consider exploring other AI-based software that provides feedback on students writing.

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