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The Impact of AI-Assisted Feedback Tools on Rural EFL Learners' Writing Anxiety and Autonomy in Bangladesh

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Abstract

The study explored the effects of AI-based feedback tools on writing anxiety and learner autonomy among rural Bangladeshi EFL learners. This study aimed to evaluate the impact of AI writing tools, such as ChatGPT and Grammarly, on the anxiety of writing and independent learning skills of secondary school students from rural communities. 120 EFL learners were selected from four rural institutions of Bangladesh, and the quasi-experimental design was adopted to conduct the study. Pre-test and post-test questionnaires modified from the Foreign Language Writing Anxiety Scale and Learner Autonomy Scale were used as instruments for collecting quantitative data. The intervention period lasted for 8 weeks, and the teachers provided feedback to the experimental group in writing using the AI tool, while feedback on writing was given to the control group manually by the teachers. The data were analyzed using paired-sample t-tests and descriptive statistics for quantitative data. The findings indicated that the writing anxiety level and writing autonomy level of the group of learners who adopted the AI-assisted feedback tools were significantly lower than those of the control group. The participants also reported that their English writing confidence, self-regulation, and motivation in English writing have been improved; however, they have expressed concerns about using AI excessively for writing feedback.

Keywords: Artificial Intelligence, Anxiety, Autonomy, EFL, Bangladesh

I. INTRODUCTION

English writing is one of the most challenging English as a Foreign Language (EFL) learning skills and one of the least taught learning skills in the school context, including the remote areas in which the quality of English education and technology is poor. Rural learners, however, encounter difficulties in structuring ideas, utilizing grammar in relation to text in English, and expressing themselves with writing assignments in Bangladesh (Rahman & Pandian, 2018). The problems frequently trigger writing anxiety that consequently impacts learners' motivation, confidence, and writing performance (Cheng, 2004). Meanwhile, there are few opportunities for individualized feedback and autonomous learning practices in traditional teacher-centered classrooms of many rural schools. Recently, there have been several developments in AI that have improved its ability to provide personalized, real-time, interactive writing feedback for learners, such as the creation of creative tools like Grammarly and ChatGPT. AI tools for feedback have been becoming more popular in the field of language education due to their ability to provide grammar correction, vocabulary improvement, and self-correction feedback (Kohnke, Moorhouse, & Zou, 2023). Research in the past has indicated that using technology in the feedback process can enhance student writing and engagement, as students are able to make revisions on their own and receive feedback immediately (Warschauer & Grimes, 2008). Also, the AI-based learning environment can promote learner autonomy, defined as the capacity of the learners to take responsibility for their own learning (Holec, 1981).

While the use of AI technologies has grown in the education sector, there is limited research that has investigated the effectiveness of these technologies in an EFL setting in a rural community in Bangladesh. Past research is generally limited to urban schools or to postsecondary institutions and excludes rural students in secondary schools. Moreover, little is discussed about how writing anxiety and student autonomy will be influenced by the use of AI-based feedback. This is a major concern for rural students who might experience technical problems, have less teacher support, and less exposure to English outside of school. Therefore, the present study aims to find out the impact of giving feedback to students by using the AI tools on their writing anxiety and autonomy in the learning environment of rural students in Bangladesh. Overall, the study is important because it adds to the existing body of literature about AI in the field of language education and offers valuable insights for educators, policymakers, and curriculum planners. The findings may help to promote the use of technology in the education process to build the confidence, independence, and writing abilities of students in rural areas.

II. LITERATURE REVIEW

Artificial intelligence (AI) has been a game-changer in language learning, particularly in providing students with feedback for their writing skills. The advent of artificial intelligence (AI) has transformed the landscape of language learning, with AI-driven feedback systems playing a crucial role in supporting students' writing practice. In recent years, Artificial Intelligence (AI) has transformed the field of language learning and teaching by creating AI-driven feedback systems that help students enhance their writing skills. Artificial Intelligence (AI) has now become a game-changer in language education, with the development of AI-powered feedback systems that support learners in their writing development. With the help of AI tools such as ChatGPT and Grammarly, real-time feedback, grammar suggestions, and word recommendations can assist students in enhancing their writing skills and motivation (Kohnke, Moorhouse, & Zou, 2023). Teaching in the EFL class is increasingly focused on personalized learning and personalized teaching, and learning technologies are increasingly used in this context. Writing

anxiety is one of the common problems faced by EFL learners. In the sense of harming writing achievement, participation, and confidence in writing, Cheng (2004) believes that writing anxiety is harmful. Students in the classroom are likely to be reluctant to do writing tasks because of anxiety and possible poor evaluation. This is further compounded by low exposure to English and teachers' feedback in rural areas in Bangladesh (Rahman & Pandian, 2018).

Horwitz, Horwitz and Cope (1986) indicated that the foreign language anxiety can have a significant impact on the learning process in the classroom. Their research has shown that anxious learners have difficulties communicating and with academic activities, including writing, in which they must be linguistically accurate. This is important for rural learners of EFL when they often lack support in learning. Warschauer and Grimes (2008) claim that the applications of automated writing evaluation systems can improve students' writing abilities by providing real-time and individualized feedback. They have discovered that technology in the revision process can motivate and engage the learner in the process. AI feedback also decreases the need for teachers, as it allows students to self-correct. Learner autonomy has become an important aspect in language learning. According to Holec (1981) learning autonomy is defined as being responsible for one's own learning. Self-regulated learners assume responsibility for learning, select strategies to learn, and evaluate learning. Further autonomy can be realized with the help of AI technologies, where students can edit and modify their written work without continued monitoring from the teacher.

Little (1991) observed that the more independent a learner is, the more motivated he or she will be, more confident and the better he/she will learn a language in the long run. He stated that technology-driven learning settings can promote students to be active learners in their learning. AI-powered tools are in keeping with this idea, providing tailored assistance and self-learning opportunities. Grammarly is a tool for writing that uses artificial intelligence. Grammarly is an AI writing assistant. Grammarly enhanced the accuracy of grammar and the confidence of learners in writing (O'Neill & Russell, 2019). The participants expressed positive attitudes towards automated feedback, as it enabled them to correct their mistakes right away and by themselves. The study also found some concerns about overuse of automatic correction systems; however. Research on ChatGPT has recently been conducted in the past few years, indicating that conversational AI can aid in the development of EFL writing. Kasneci et al. (2023) proposed that ChatGPT could assist with brainstorming, structuring and language in writing. Writing-related stress is reduced and students are motivated by interactive feedback and immediate responses. However, issues related to plagiarism and excessive reliance are still significant ethical issues to consider. In the Asian EFL settings, technology-based language learning has been proven to yield positive results. The use of AI-assisted feedback resulted in more high-quality revisions, as well as more self-regulated learning (SRL) skills among learners (Zhang & Hyland, 2022). They found that the confidence of students with digital feedback tools in writing activities was higher.

Studies conducted in Bangladesh do not indicate much use of AI to provide feedback on writing. The problems of the English classrooms in Bangladesh were identified as inadequate technological infrastructure, limited teacher training, and a lack of digital literacy by Hasan and Akhand (2010). This is more of a problem in rural schools, as they may not have access to the internet as well as education resources. Islam and Bari (2021) conducted a study on technology use in rural education in Bangladesh and found that digital technology was perceived as positive for students' motivation and engagement in their learning. Their study wasn't, however, specifically looking at AI-enhancing feedback or writing anxiety. This means that there is a great need for more studies in ELT in rural settings. The literature suggests that these tools, which

involve AI, can improve writing outcomes, reduce anxiety and foster learner independence. The linkages among these, however, have been little investigated in rural EFL contexts in Bangladesh. Hence, this study aims to fill this gap and examine how the writing anxiety and autonomy of rural learners are affected by the use of writers' support tools with the aid of artificial intelligence.

III. RESEARCH OBJECTIVES

The present study explores the effects of using AI feedback tools on writing anxiety and self-directedness of EFL learners in secondary-level English writing classes of the rural learners in Bangladesh.

IV. RESEARCH METHOD

The current study used quantitative methods to gain a holistic understanding of the effects of the application of AI tools for feedback on the writing anxiety and learner autonomy (LA) of rural EFL students in Bangladesh. The quasi-experimental design was used to compare the results of the experimental and control groups. This study is based on the purposive sampling of secondary school level 120 EFL learners in the four secondary schools of rural areas of Bangladesh. The participants were randomly assigned to two groups, one experimental group and one control group, both of which were the same size. The participants were divided into two groups: An experimental group that received feedback on their writing using AI tools such as Grammarly and ChatGPT, and a control group that received feedback solely from their teacher. This intervention lasted for 8 weeks and included activities in the areas of paragraph writing and essay writing. The quantitative data was collected by administering pre- and post-test questionnaires using the Second Language Writing Anxiety Inventory (SLWAI) and a validated Learner Autonomy scale. All of them were the instruments related to changes in writing anxiety level and changes in autonomy development of the learners. For quantitative data, SPSS software was used for the analysis of the data. The descriptive statistics were used to determine a significant difference between pre-test and post-test scores within and between the groups by using a paired-sample t-test. The data types were integrated, and triangulation was used, which led to finding valid and deep interpretations. The principles of ethical consideration, informed consent, participant confidentiality and participant choice, were consistently maintained during the study.

V. FINDINGS OF THIS STUDY

The data was analyzed in this section before the quantitative results of the study on the effect of using AI-assisted feedback methods on anxiety when writing and student autonomy were presented. The quantitative findings of the study were presented with descriptive statistics, paired-sample t-tests, results, and graphical representation of the effect of the AI-assisted feedback methods on the writing anxiety and learner autonomy of the rural EFL learners in Bangladesh.

Descriptive Statistics (Pre-test and Post-test)

Table 1: Mean Scores of Writing Anxiety and Learner Autonomy

Group	Measure	Pre-Test Mean	Post-Test Mean	Mean Difference
Experimental (AI-assisted)	Writing Anxiety	3.82	2.41	-1.41
Control (Teacher feedback)	Writing Anxiety	3.79	3.45	-0.34
Experimental (AI-assisted)	Learner Autonomy	2.88	4.12	+1.24
Control (Teacher feedback)	Learner Autonomy	2.90	3.15	+0.25

The descriptive data reveal a definite improvement in the experimental group. The writing anxiety was greatly decreased (the average was reduced from 3.82 to 2.41), and the learner autonomy was raised (from 2.88 to 4.12). There were relatively small changes in the control group. This indicates that the tools that were enhanced by AI had a more positive impact than teacher feedback.

Paired Sample t-Test Results

Table 2: t-Test Analysis

Variable	Group	t-value	df	Sig. (p)	Result
Writing Anxiety	Experimental	9.87	59	.000	Significant
Writing Anxiety	Control	2.11	59	.039	Weakly Significant
Learner Autonomy	Experimental	10.42	59	.000	Significant
Learner Autonomy	Control	2.45	59	.017	Moderate

Analysis showed that both variables were significantly different ($p < 0.05$). There was very significant reduction in writing anxiety for the experimental group ($t = 9.87$, $p = .000$) and there was very significant increase in autonomy for the experimental group ($t = 10.42$, $p = .000$). The control group, on the other hand, experienced minimal improvements, indicating that the traditional feedback process is not as effective as AI systems.

One-Way ANOVA Results

To further explore group differences, a one-way ANOVA was carried out on the post-test between groups.

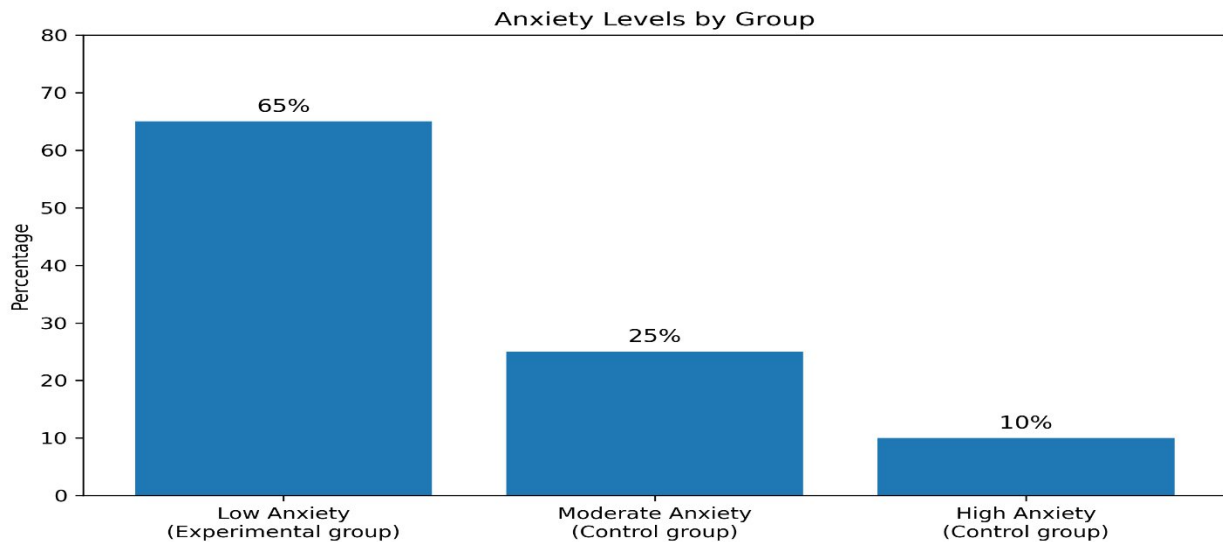
Table 3: Differences in Writing Anxiety and Learner Autonomy

Variable	F-value	Sig. (p)	Interpretation
Writing Anxiety	18.56	.000	Significant difference
Learner Autonomy	21.34	.000	Significant difference

The results show that the difference between the experimental and the control groups is

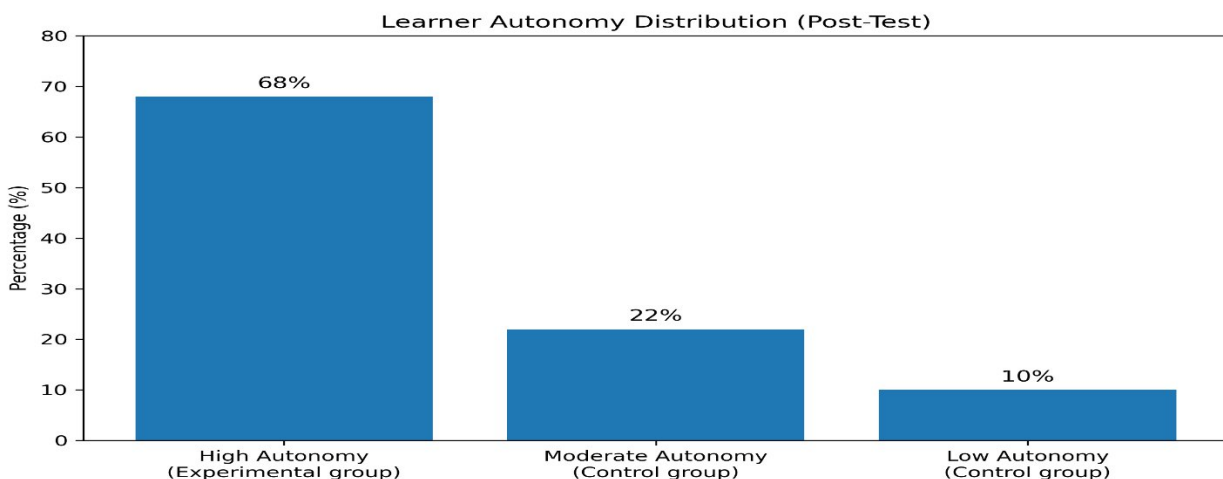
significant for a given level of confidence. High f-values indicate that the results are quite different, with the AI feedback having a higher reduction in anxiety and a higher increase in autonomy.

Figure 1: Distribution of Writing Anxiety Levels (Post-Test)



The pie graph indicates that after the intervention, the largest proportion of learners in the experimental group were in the low anxiety level. In contrast, many remained at moderate or high levels of anxiety in the control group. A visual distribution that helps to make AI more effective in combating psychological obstacles to writing.

Figure 2: Learner Autonomy Distribution (Post-Test)



The autonomy distribution increases considerably for the learners who are supported in the learning process through AI for feedback. The majority of them had high autonomy scores, representing a high level of autonomy in self-regulation, revision, and reliance on teacher revision.

VI. DISCUSSION OF THE FINDINGS

The analysis reveals that the application of AI tools for feedback, like Grammarly and ChatGPT, was a highly effective component of improved writing skills of rural EFL learners. Results indicated that the level of writing anxiety in the experimental group significantly decreased as compared to that of the control group. This suggests that the use of AI feedback had a positive impact on creating a less stressful learning environment, enabling students to write with increased confidence and reduced anxiety about making mistakes. The study additionally uncovered that students who utilized AI tools reported a major increase in learner self-reliance. Learners developed more autonomy in self-correcting, editing, and improving drafts and engaged in effective production with less teacher involvement in the writing process. Moreover, the statistical results such as t-tests and ANOVA, showed significant differences between experimental and control groups, which indicated the effectiveness of AI-assisted learning. The visual interpretation of pie charts also supported these outcomes and made it clear that the psychological factors and learning achievements were enhanced. Lastly, the AI writing feedback systems had a strong impact on students' writing abilities and confidence, and fostered their self-directed learning in the context of EFL writing in rural learners. The study's findings directly address the study's aim of investigating the effect of AI feedback on writing anxiety and learner autonomy. The results support the notion that AI tools foster an environment of learning through immediate feedback, mitigation of fear of failure, and promotion of self-directed learning practices. But the findings also highlighted a small concern: there was a need for a balance between the use of AI-generated corrections and teacher input, as some learners were dependent on the AI-generated corrections.

VII. CONCLUSION

The results of this study reveal that the anxiety of writing and the autonomy of the learners can be significantly reduced by making use of AI-based feedback tools in the context of rural EFL learners in Bangladesh. The results indicated that the learners using Grammarly and ChatGPT showed a higher level of confidence, self-regulation, and independence in their English writing tasks than the learners who were given traditional teacher feedback. The effectiveness of the implementation of the learning environment with the use of Artificial Intelligence was supported by the statistical analysis of psychological and academic outcomes. There are some concerns about over-dependence on AI tools, but the overall results highlight the potential of AI-enhanced teaching in rural schools. To that end, teachers and policymakers need to acknowledge and encourage the judicious and responsible utilization of AI technologies for the education of EFL writing in Bangladesh.

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