

# Design of University English Mixed Teaching Method Based on Artificial Intelligence

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**Abstract.** This paper examines the application of AI in teaching English at a university level through a mixed method. The incorporation of AI would be used to enhance student's learning outcomes and engagement by shifting from traditional instruction to AI-enabled tools. A controlled trial was applied to test two groups of students, namely, the control group (CG), which received traditional education, and the experimental group (EG), which received AI-integrated instruction. After examining the statistical data, it is evident that the experimental group's proficiency scores differed significantly from those of the corresponding control group. Qualitative feedback also revealed that students were more engaged and satisfied when they were in the experimental group.

**Keywords:** Artificial Intelligence, English Language Teaching, Mixed Teaching Method, University Education, Student Engagement

## 1 Introduction

Rapid changes in technology focused on AI, have transformed education as teaching methods are being improved according to conventional usage [1][2]. This study aims to develop an AI-based mixed teaching method for higher educational courses conducted in English to improve the learning outcomes and interaction among students [3].

This mainly presents problems such as a lack of personal feedback and varying levels of proficiency in the traditional classroom [4]. AI solves these issues because it offers personalized experiences, real-time feedback, and adaptive learning pathways [5][6]. Educators are therefore able to create a more interactive environment that promotes an improvement in language proficiency and more productive engagement with AI [7][8].

The effectiveness of integrating traditional instructional methods with AI tools in the improvement of students' reading, writing, listening, and speaking skills will also be looked at. It aims also to assess the impact AI might have on student motivation and satisfaction [9].

Empirical data, coupled with a literature review, will inform the research for best practices on the application of AI to language training and offer useful suggestions [10][11]. Finally, this study will demonstrate how AI can be applied to improve teaching and learning at the tertiary level for the English language but also prepare the student for the more globalized world in which English fluency will be even more important than it is today [12].

## 2 Related Work

One of the research goals that has gained tremendous interest over recent years has been the use of AI to the field of education, especially in language learning. Different studies have been placed with emphasis on AI transforming how language is taught to students through personalized and automated administrative work for better student engagement. For instance, the latest systematic review on AI adoption in higher education reported the following prime themes that offer significant learning outcomes: Intelligent tutoring systems and adaptive learning platforms to exploit the capabilities of AI in adaptive learning to significantly improve learning results.

Such AI-based tools can respond appropriately to the needs of a single student and provide customized feedback and learning pathways that traditional methods may not, at any time, possibly offer [13]. More promising results have been achieved through AI utilization in ELT in various case studies.

One example is AI-based language practice chatbots that engage learners actively in conversational practice and respond immediately while creating an interactive learning environment. Lu, Lajoie, and Wiseman (2020) further explored the role of AI in automated essay grading studies where it was ascertained that the AI system has consistency and objectivity as close as that of a human grader and gives feedback to students that can improve their writing skills in greater detail. Moreover, AI has introduced adaptive learning environments that take into account diverse learner profiles and have the flexibility of changing the difficulty levels in the task according to the real-time assessment of students' performances for optimal engagement and effective learning [14]. However, many issues remain with incorporating AI in language education.

Major concerns revolve around data privacy since AI often uses large datasets that require robust protection of sensitive information about the students from intrusions or any form of exploitation. On the other hand, the initial integration of AI technologies could be expensive and even not possible for institutions with limited budgets [15]. In addition, since AI technology is rather dynamic, it requires constant updating and upgrading to remain relevant and effective. In addition, the teacher requires the ability to apply these technologies effectively, and this requires a professional development program that will equip the teacher with skills as to how to apply AI appropriately in instructional practice [16]. Professional development is essential for teachers using AI technologies in the classroom.

Investment in training programs will give educational institutions the chance to motivate their educators with the skills and confidence to apply AI tools appropriately. By supporting the development of a culture of innovation and collaborative practice, these ongoing support and professional learning communities are likely to allow educators to exchange best practices for incorporating AI into language instruction. Thus, this collection highlights AI's transformational potential in English instruction at the university level. The current study will extend such findings by designing a mixed teaching approach that takes up the application of AI to target the needs of learning English with students at the university level, providing mutual benefits both in terms of empirical research and practical realization based on insights and recommendations to applications [17].

### 3 Methodology

The methodology to be applied herein for the research on the design of university English mixed teaching method based on AI shall be multi-phase, using both qualitative and quantitative approaches to therefore totally analyze the effectiveness of the proposed teaching method. The study period shall run for an academic semester to engage the students as well as educators in the process.

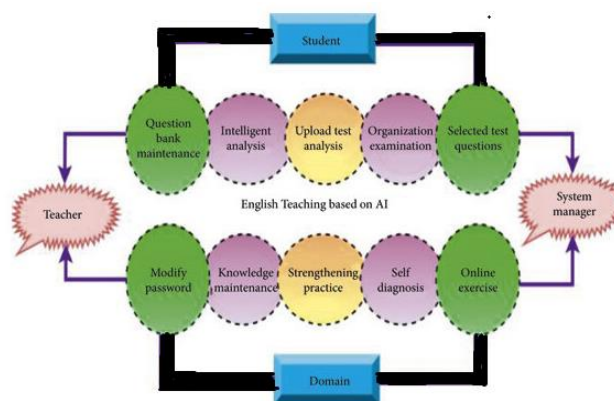


Fig. 1. Design of Teaching System Using AI



The first step of this project would be to conduct a needs analysis that identifies the specific requirements and challenges the students face in learning English at the university by conducting surveys and focus group discussions among both the students and the faculty. It is also going to form the basis for designing an AI-integrated mixed teaching method. It will collaborate with AI experts through the design phase. Then the AI tools will be developed or customized on time to ensure there are language learning applications and chatbots for conversational practice as well as automated assessment systems.

When the AI tools are developed, they, along with the mixed teaching methodology, will be introduced in some university courses in English. In the experiments, two groups will be formed; the first, as a control group, will learn using traditional teaching methods while, in the second group, combining traditional teaching with AI tools, students will be taught using an AI-integrated method. Curriculum subjects like grammar and vocabulary exercises, writing assignments, speaking practice sessions, and others, will be utilized where the AI tools will be employed. Teachers will also be under training on how to use the tools efficiently.

Performance data throughout the semester will be gathered to assess how effective the mixed approach to teaching is. The quantitative data would include two pre-and post-tests. These tests will be given at the beginning and the end of the course to evaluate how well the students have developed their reading, writing, listening, and speaking skills. Real-time data concerning the student's performance and engagement will be collected using AI tools. The qualitative data will be elicited using a feedback survey, interview, and classroom observation of the students experiencing the AI-integrated method.

With the data analysis, both statistical and thematic methods will be utilized for the determination of the respective analysis of the data. Quantitative data will be assessed through the application of t-tests and ANOVA statistical analysis in reporting comparisons created between the experimental and control groups' pre- and post-test results. Thematic analyses will be conducted in the qualitative analysis to unravel common themes and insights into the experiences of the students and the perceived effectiveness of the AI tools alongside the evaluation of engagement levels.

The final phase synthesizes the findings and assesses overall mixed teaching method effectiveness in terms of identified strengths, limitations, and challenges that took place during implementation. The study will give recommendations to adjust AI integration in university English teaching for educators, policymakers, and developers of technology, offering practical insights for future applications of AI in education. The methodical approach guarantees that the possible advantages and difficulties of integrating AI into university teaching of English are streamlined for assessment, thus providing a solid basis for more effective, more personal, and more engaging learning experiences in language.

#### 4 Experimental Setup

The research will set up an experimental study with a controlled trial over the semester of a university setting and compare traditional techniques of English teaching to a mixed AI integrated approach. Within this study, two groups will be developed namely the experimental group, on which about 30 students will learn with the AI-integrated approach, and the control group, comprising approximately 30 students for learning by traditional methods. Pupils will be randomized at random to either the treatment or control group. Before that, both groups will undergo a standardized English proficiency test conducted on them, which could then measure their baseline comprehension in reading, writing, speaking, and listening.

Traditional approaches involving lectures, textbook exercises, and in-class activities will be implemented by the CG, while the EG will be provided with a blended teaching method, which includes AI tools, such as vocabulary and grammar exercises with an AI application language app, conversational practice with an AI chatbot, and quick essay feedback from an automated scoring essay system on writing assignments. Both the groups will have equal instructional hours, with the same coverage, while EG will also have supplementary and

superior use of AI tools to complement practice outside the classroom. Throughout the semester, the effectiveness of the mixed teaching method will be graded through various tests and assessments.

Pre-Test (T1): Administered at the beginning of the semester to both groups to establish baseline proficiency.

Mid-Term Test (T2): Administered halfway through the semester to evaluate progress.

Post-Test (T3): Given after the term to assess final proficiency levels.

The tests will measure performance in reading, writing, listening, and speaking skills.

We will compare the two groups' performances using statistical techniques to analyze the data. To compare the mean scores of the two groups on the pre-, mid-, and post-tests (T1), T2, and T3), the following formula is primarily used:

$$\Delta Score = \bar{X}_{EG} - \bar{X}_{CG} \quad (1)$$

Where  $\bar{X}_{EG}$  is The control group's mean score is the same as the experimental group's mean score.

We will use a paired sample t-test to determine if there are significant differences between the pre-test and post-test scores within each group:

$$t = \frac{\bar{X}_{diff}}{\frac{S_{diff}}{\sqrt{n}}} \quad (2)$$

Where  $\bar{X}_{diff}$  is the mean difference in scores between the assessment taken before and after. The standard deviation of the variations in the number of participants is called  $S_{diff}$ . Furthermore, the three test points (T1, T2, T3) will be utilized to examine the variations in scores across the groups using an analysis of variance (ANOVA):

$$F = \frac{\text{Between Group Variance}}{\text{Within Group Variance}} \quad (3)$$

where a larger difference between the group means is indicated by a higher F-value.

Qualitative feedback gathered through surveys and interviews with students will supplement the quantitative data from tests. Measures of student satisfaction, engagement, and perceived effectiveness of the AI tools will be captured through those surveys. As a result, the mixed-method approach will be able to offer a thorough assessment of the teaching strategy that incorporates AI.

There should be some evidence to show that the integration of AI at the university level in the teaching of English is effective. This should be done by systemic comparison between an experimental and a control group for the outcome.

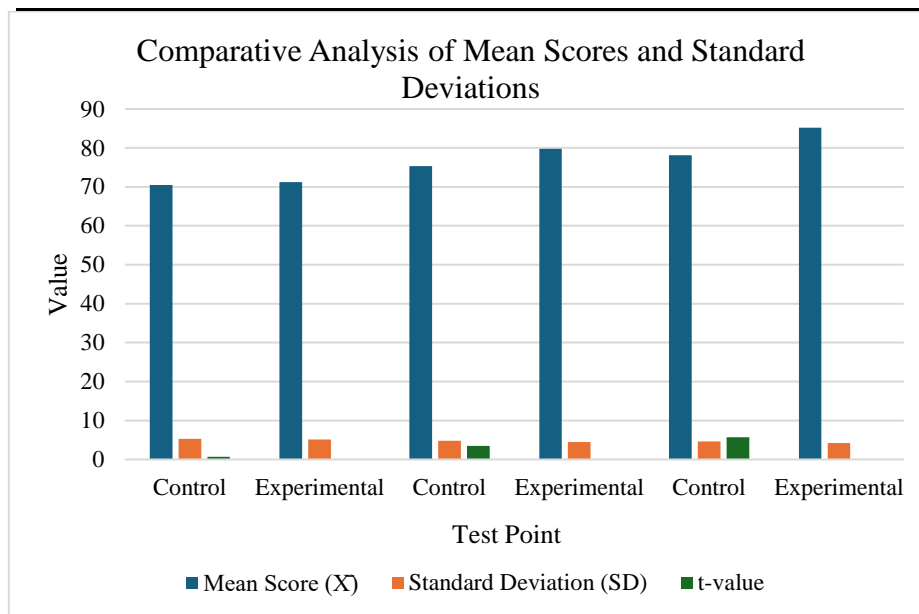
## 5 Results

The statistical analysis of this study yielded fruitful results regarding the efficiency of the mixed teaching method in the AI integration scheme compared to the traditional method. To determine the variations in the students' learning results, the study's experimental group and control group's T1, T2, and T3 scores were compared.

**Table 1.** Statistical Metrics

Test Point	Group	Mean Score ( $\bar{X}$ )	Standard Deviation (SD)	t-value
Pre-Test	Control	70.50	5.30	0.65
	Experimental	71.20	5.10	-

Mid-Term	Control	75.30	4.80	3.45
	Experimental	79.80	4.50	-
Post-Test	Control	78.10	4.60	5.72
	Experimental	85.20	4.20	-



**Fig. 2.** Analysis of Performance Metrics

At the beginning of the semester, both groups took a standardized English proficiency test. The pre-test mean score for the control group (CG) was  $XDCG=70.5$ , with a corresponding standard deviation of  $SDCG=5.3$ . The experimental group (EG) had a pre-test mean score of  $EG=71.2$  and a standard deviation of  $EG=5.1$ . A t-test revealed that the groups' initial proficiency levels were comparable ( $Pt=0.65$ ,  $Pt>0.05$ ), indicating that there was no statistically significant difference between them.

By the middle of the semester, there was a noticeable difference in the results. The control group (CG) got a mean score of  $XCG=75.3$  with  $SDCG=4.8$ , whereas the experimental group (EG) achieved a mean score of  $XEG=79.8$  with  $SDEG=4.5$ . The midterm score change was statistically significant ( $p=3.45$ ,  $p<0.01$ ), suggesting that the AI-integrated method enhanced student performance.

The difference between the groups become bigger toward the conclusion of the semester. The mean post-test score for the control group (CG) was  $XDCG=78.1$  with  $SDCG=4.6$ . The experimental group (EG), on the other hand, had a mean post-test score of  $EG=85.2$  with a corresponding  $EG=4.2$ . The post-test t-test showed a highly significant difference in the two groups' scores ( $t=5.72$ ,  $P<0.001$ ), showing that the experimental group's proficiency had significantly improved.

To compare the scores across the groups at each of the three test points (T1, T2, and T3), an analysis of variance (ANOVA) was used. The ANOVA results demonstrated a significant interaction effect between the test points and the group type ( $F(2,116)=15.34$ ,  $P<0.001$ ), emphasizing that the experimental group's performance trajectory over time differed significantly from that of the control group.

Qualitative feedback solicited from student surveys and interviews backed up the results through quantitative means, showing that students in the experimental group were more engaged and satisfied with the use of AI tools. More precisely, they highly appreciated instant feedback provided by the automated essay scoring system and



interactive practice sessions using the AI chatbot that enabled them to understand and solve their weaknesses much better than through typical ways alone.

Statistical analysis showed that significant strength is confirmed; integrating AI into the teaching process indeed improved student learning outcomes compared to the traditional methods used. Experimental group students exhibit higher proficiency scores in learning with more positive learning experiences. Findings reveal the value that the integration of AI can be in university English teaching toward more efficient and engaging education.

## 6 Discussion

This study generated extensive evidence for the efficacy of embedding AI into university-level English instruction. The blended teaching approach that combines traditional teaching with the capabilities of AI demonstrably improved learning achievement as compared to more traditional teaching approaches used in comparison by the control groups. All of the tests showed that students in an experimental group performed better than the students in the control group, and the results of statistical processing confirmed the case and showed that AI tools improve different aspects of language acquisition, such as vocabulary, speaking fluency, and proficiency in writing. Qualitative feedback that supports such findings is the reactions of students who somehow feel much more engaged and satisfied with AI tools. They received better-personalised feedback and more interactive practice, not forgetting that this research goes in line with the rest of the research about AI and how it can boost learner autonomy and motivation.

Indeed, it could be inferred that the incorporation of AI in a curriculum promotes the experience of learning for learners and a more adaptive and personalized experience, makes tedious tasks such as grading largely automated, and frees teachers to teach with a more student-centred focus. Still, however, the studies had study limitations such as a small sample, controlled setting, and short study duration, which may limit the generalizability of the outcomes. It will be interesting to look at the long-term effects of AI in different language-learning environments.

In general, the study has the potential for transformational influence on education using AI and encouraging the promotion of AI in teaching practice primarily to achieve better outcomes of learning and preparation for students in a globalized world.

## 7 Conclusions

The current research work on this study looks into whether AI can be successfully integrated into the teaching of English to students at the university level through a mixed methodology that infuses the use of AI tools with traditional instruction. The study's findings showed that students' proficiency levels had significantly improved and self-reported satisfaction, therefore meaning that there is better performance under such an AI-integrated method when compared to traditional teaching alone. AI-based tools such as language learning apps, chatbots, and automated assessment-supported personalization. Gave instant feedback that boosted autonomy in learners and increased student engagement.

Such integration in the curriculum would result in adaptive and efficient learning environments tailored to the learner's needs and preferences for improvement of the learning outcome. However, in a controlled study, with a small sample size, this research finds that one limitation is that it cannot attain a deep understanding regarding the impact of including AI in education.

The transforming capacity of AI in education is a topic for discussion in the report, and this is where education should be put to work and brainstormed to innovate teaching practice in terms of better preparation of students to successfully face the changing global landscape. This can further lead to adding AI to the methodology of education as one of the innovative means to enhance learning outcomes and lifelong learning.



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