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| RESEARCH ARTICLE

Bridging Language and Technology: Enhancing English Proficiency for Applied College Students in Business, Computer Science, and Accounting

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| ABSTRACT
English proficiency has become a dire necessity for the students in an increasingly interconnected world in applied disciplines such as Business, Computer Science and Accounting. Language skills are important to understand innovative technology in order to collaborate and communicate globally. This paper explores the connection between language learning and technology highlighting innovations such as AI driven platforms , virtual reality , gamified applications designed to take care of the specific linguistic needs of applied college students. The discussion examines the transformative potential of these tools while examining challenges such as approachability, curriculum integration , and pedagogical adoption. By collecting feedback from the current research, the paper figures out practical strategies and future directions as to how technological innovations can be used for language education. The findings highlight the role of technology as a bridge that connects students to professional success and global opportunities.

| KEYWORDS
English proficiency, applied disciplines, Business, Computer, Accounting, AI driven platforms

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1. Introduction

In today's globalised setting , English has achieved the status of the only language to become a source of international communication, collaboration and exchange of knowledge. For students in applied subjects such as Business Administration, Computer Science and Accounting, English proficiency is not just an academic obligation but a fundamental skill that opens their professional career. These fields demand more than technical knowledge of their subjects. They require the ability to share ideas, discuss solutions and coordinate with different groups of people , often across cultural and geographical boundaries.

The use of technology in education has helped to solve issues associated with the traditional language learning methods. Traditional class room approaches often do not fulfil diverse linguistic and contextual needs of the students in applied fields. Business Administration students must explore the intricacies of professional communication from drafting strategic schemes to leading discussions. At the same time Computer Science students also need the fluency to decode technical terms , write codes and work in a team with global experts.. Similarly, Accounting students must be able to cope with the international standards, make detailed reports and communicate financial data effectively. These specific need demonstrates dynamic learning approaches that accommodate the sole purpose of each discipline.

Technology provides a comprehensive plan to this challenge. Over the years progress in digital tools has dramatically changed the way languages are taught and learned. Artificial intelligence(AI), machine learning, and natural language processing (NLP) have

paved the way for personalized learning experiences. Gamified applications, virtual reality (VR) and collaborative online tools have made learning more interactive and engaging. By applying these skills to their language education, students in applied fields can learn the communication skills needed to succeed in their careers.

However, the assimilation of technology into language learning is not without certain obstacles.. Issues such as access and affordability, resistance to change, curriculum alignment and data privacy concerns pose significant hurdles. Moreover, the success of these tools depends on their significance to the specific linguistic needs of students in each field. For example, while a general English app might improve vocabulary, but it might fail to teach technical terminologies of Business Administration, Accounting and Computer programming.

This paper deals with the connection between language learning and technology, aiming at its possibility to develop English proficiency among applied college undergraduates in Business Administration, Computer Science and Accounting. It studies the advancements that are reforming language education , the constraints that blocks their implementation and the policies needed to solve these issues. Through a detailed discussion, the paper aims to provide a blueprint for educators, policymakers, and technologists to make use of the full potential of technology in narrowing down the gaps between language proficiency and professional excellence. In doing so, it explains the important role of English not as merely a language of communication but as a bridge to success in a globalized world.

2. Research Design and Rationale

This study employs a mixed-methods research design, blending both quantitative and qualitative approaches to provide a well-rounded look at technology's impact on language learning. We take a quasi-experimental approach, comparing two groups of students: one that sticks to traditional English instruction (control group) and another that gets to use tech-assisted learning tools (experimental group). This choice stems from practical and ethical reasons—students are assigned based on their existing classroom arrangements rather than random selection, making sure the study reflects real-world education.

We chose a mixed-methods approach to capture both the measurable improvements in language proficiency and the personal insights of students' learning experiences. The quantitative side involves pre-tests and post-tests, plus surveys that ask students to report their proficiency and confidence levels. For the qualitative side, we'll conduct interviews and focus group discussions in the classroom to gather students' thoughts on how effective and user-friendly the digital learning tools are. This two-pronged method ensures we evaluate not just academic performance but also how well students adapt to tech-enhanced learning.

2.1. Participants and Sampling

Choosing the right participants is important for the reliability and validity of our research outcomes. Our study focuses on undergraduate students enrolled in applied college programs—Business, Computer Science, and Accounting—because these fields demand a solid grasp of English for success in both academia and the workplace. We'll use a purposive sampling technique to make sure we include students with different proficiency levels who are eager to take part in a technology-enhanced language learning experience.

In this study, we use a purposive sampling method to focus on students who fit specific criteria:

- They must be enrolled in an applied college program, like Business, Computer Science, or Accounting.
- Their English proficiency should range from beginner to intermediate.
- They need to be willing to participate in the research and complete all necessary assessments.

We aim for a minimum sample size of 60 students, comprising 30 in the experimental group, who will use technology-enhanced learning, and 30 in the control group, who will experience traditional instruction. This sample size is chosen based on both feasibility and the statistical requirements for making comparative analyses between the two groups.

2.2. Participant Grouping and Experimental Design

Our research uses a quasi-experimental design, assigning students to groups based on their existing classroom sections rather than random selection. This approach maintains practical feasibility while ensuring the integrity of our comparative study. The two groups are set up as follows:

Experimental Group: Students in this group will engage in English language learning through AI-powered writing assistants (like Grammarly or ChatGPT), gamified learning applications (such as Duolingo or Kahoot), and speech recognition software (for example, Google Speech-to-Text or ELSA Speak). The goal is to assess how these digital tools impact language acquisition and proficiency improvement.

Control Group: Students in this group will follow a traditional English language curriculum, which includes textbook-based learning, classroom discussions, and written assignments, all without utilizing additional technology. This group is a baseline for comparison.

3. Data Collection Methods

Effective data collection is key to ensuring the validity and reliability of our findings. This study uses a mixed-methods approach, combining both quantitative and qualitative data collection techniques to evaluate the impact of technology-enhanced learning on English proficiency among college students in Business, Computer Science, and Accounting.

3.1 Quantitative Data Collection

The quantitative aspect of this study focuses on measuring improvements in students' English proficiency through structured assessments and self-reported surveys. We employ the following methods:

3.2 Pre-Test and Post-Test Assessments

To objectively assess improvements in language proficiency, all participants will complete standardized pre-test and post-test assessments. These tests will measure four core language skills:

- Listening Comprehension – Understanding spoken English through audio-based exercises.
- Reading Comprehension – Analysing and interpreting written texts.
- Writing Skills – Evaluating grammar, sentence structure, and coherence.
- Speaking Proficiency – Assessing fluency and pronunciation through oral tasks.

The same assessment will be given both before and after the intervention to quantify the influence of AI-powered learning tools compared to traditional instruction.

3.3 Survey Questionnaires

To evaluate changes in students' confidence, motivation, and engagement in English learning, a Likert-scale survey will be conducted before and after the intervention. The survey will include statements like:

- "I feel confident in my ability to communicate in English."
- "I find technology-assisted learning tools effective in improving my English skills."
- "I am motivated to engage with English learning materials."

Responses will range from Strongly Disagree (1) to Strongly Agree (5), yielding a numerical representation of students' self-perceived improvements.

3.4 Qualitative Data Collection

While quantitative data gives us concrete numbers, the qualitative part of this study dives into students' experiences, obstacles, and thoughts about learning with technology.

To get a better understanding on how students interact with AI tools, we'll take a close look at usage logs and engagement metrics. This includes:

- Time spent on digital platforms (like Duolingo and how often students use Grammarly).
- The accuracy of AI corrections on writing tasks.
- Tracking progress in speech recognition exercises.

By combining engagement data with test scores and qualitative feedback, the goal is to find a clear link between using technology and improving language skills.

4. Data Analysis Procedures

Analysing the data is an important step in this research, as it reveals how technology-enhanced learning affects English proficiency among applied college students in Business, Computer Science, and Accounting. We're using a mixed-methods approach to combine solid quantitative analysis with a deeper qualitative understanding of how students are making progress in language learning. The analysis blends statistical methods for numerical data with thematic analysis for the more subjective insights, allowing for a thorough evaluation of the intervention's effectiveness.

4.1 Quantitative Data Analysis

The quantitative data we gathered from pre-test and post-test assessments, surveys, and engagement metrics is analysed using statistical methods to spot patterns, trends, and notable differences between control and experimental groups.

Pre-Test and Post-Test Score Analysis

- We conduct a paired t-test to see if the improvements in English proficiency within each group (control vs. experimental) are statistically important, comparing students' average scores before and after the intervention.
- An independent t-test is used to compare post-test scores between the experimental and control groups, checking if technology-enhanced learning leads to greatly greater improvements than the traditional methods.

4.2 Qualitative Data Analysis

To back up the numbers, we analyse qualitative data collected from interviews, focus group discussions, and learning engagement feedback using thematic analysis.
Future research could tackle these limitations by broadening the participant pool, conducting longitudinal studies, and adding more AI learning tools for further evaluation.

5. Results and Discussion

The findings of this study explain how effective technology-enhanced learning tools are at boosting English proficiency among undergraduate students in Business, Computer Science, and Accounting. In this section, we present both the quantitative and qualitative findings, compare results from the experimental and control groups, and discuss the implications of these results in light of the current literature.

5.1 Insights from Semi-Structured Interviews

Analysing the interviews brought to light some important points from students in the experimental group. Many students were thankful for the real-time feedback on their writing tasks offered by tools like Grammarly. One participant shared, "I can easily spot and fix my grammar mistakes now, which has really helped my writing overall." A number of students found that using speech recognition software (like Google Speech-to-Text) was really helpful for improving their pronunciation and fluency. One student remarked, "I feel way more confident speaking in English since the AI feedback shows me exactly where I mess up with pronunciation." While there were positive effects, students did mention some challenges too. They pointed out issues like the lack of personalized feedback, occasional technical glitches, and the struggle to adapt to new tools. One student mentioned, "Sometimes, the AI doesn't get my accent right, and that can be frustrating when I'm trying to learn."
Insights from Focus Group Discussions

Discussions in focus groups revealed different student views on how useful AI tools can be:
Preference for Blended Learning: Many students felt that technology should enhance, rather than replace, traditional classroom learning. One student said, "AI tools are fantastic for practice, but I still enjoy the in-person lessons for a deeper understanding."
Discipline-Specific Needs: Students from various fields reported different levels of benefit from AI tools. For example, accounting students valued tools that aided with formal writing, while computer science students appreciated the precision in technical writing that AI-assisted platforms provided.

The results from this study indicate that tech-enhanced learning tools considerably boost English proficiency among applied college students, especially in aspects like writing, speaking, and grammar. Those who interacted with AI tools showed greater improvement compared to their peers in the control group, who relied solely on traditional methods. This supports prior research emphasizing the effectiveness of AI-assisted learning in promoting language skills (Jones, 2021; Smith & Lee, 2022).

The positive outcomes seen in the experimental group can be attributed to several factors:

- Personalized feedback from AI tools delivering instant corrections allowed for quicker improvement in writing and speaking.
- The engagement and motivation from gamified learning apps like Duolingo encouraged students to practice English regularly outside their classes.
- Real-time error correction during writing and speaking tasks enabled students to actively engage in self-directed learning, which is important for picking up a new language.

Nonetheless, the study also points out some limitations of AI-based learning tools, especially concerning technical issues and the lack of human interaction in the learning experience. While these tools effectively supported language acquisition, students emphasized the value of face-to-face interactions for promoting a deeper understanding and better interpersonal communication skills.

6. Limitations and Future Research

This study explains how technology-enhanced learning tools can boost English skills among undergraduate students in fields like Business, Computer Science, and Accounting. However, it's important to recognize the limitations of the research design and methods used. Understanding these limitations helps us interpret the results more thoughtfully and lays the groundwork for future studies in this area. In this section, we'll emphasize the main limitations of the study and suggest some paths for future research that could further examine and improve the role of technology in language learning at the university level.

6.1 Sample Size and Generalizability

One major constraint of this research is the sample size. The study was performed at one institution with a relatively small group of participants (n = 60). Although the results are statistically major for this sample, we can't easily generalize these findings to a broader, more diverse student population from various institutions and regions. Limited sample size may also hinder our ability to notice subtle differences among subgroups, like those between students in different academic disciplines (Business, Computer Science, and Accounting). Future studies should aim to increase the sample size and involve participants from multiple institutions to gain a clearer idea of the wider relevance of these findings.

6.2 Short-Term Nature of the Study

This study was conducted over a brief period of just 8 weeks, which makes it tough to really understand the long-term effects that AI-based learning tools have on English proficiency. Learning a language takes time, and the improvements we notice might not stick around forever. To get a clearer picture of how technology impacts language learning, it would be great to have a longitudinal study that follows students over a longer timeframe. Plus, looking at how students continue to use AI tools after the study wraps up could show us if they're maintaining the progress they made during the experiment.

Since this study had a small sample size, future research should aim for a larger and more diverse group from various institutions. This would help make the results more applicable to a wider audience. Also, using a mixed-methods approach that combines quantitative data with qualitative insights from students would yield richer findings. Large-scale surveys combined with in-depth interviews could really help us dig deeper into students' experiences and preferences when it comes to AI tools.

While this study offers valuable insights into how AI-powered learning tools affect English proficiency, it also comes with some limitations that future research should tackle. Expanding the sample size, incorporating diverse AI tools, and looking into the long-term effects of these tools are essential for grasping the bigger picture of language learning. Plus, addressing the accessibility and fairness of AI-based resources, along with investigating how demographic factors play a role, will help ensure these tools are effective for all students. By overcoming these limitations, future studies can help enhance the development of AI-driven language learning solutions that meet the diverse needs of students in higher education.

Conclusion

To sum up, this final section wraps up the findings of the study by emphasizing their significance and offering practical recommendations for future educational practices. It revisits the key takeaways from the research, emphasizing how AI-powered learning tools have shown effectiveness in improving English proficiency among undergraduate students studying Business,

Computer Science, and Accounting. It also points out the potential of these tools to revolutionize language education and provides guidance for future research to build on what we've found in this study.

The results of this study revealed an important boost in English proficiency among students who used AI-powered learning tools. Tools like Grammarly, Duolingo, and ChatGPT were shown as bridge empowering and enhancing various aspects of language skills, especially in writing, speaking, and grammar. The experimental group that used these tools demonstrated better improvements in their pre-test and post-test scores compared to the control group that relied on traditional methods of learning languages.

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