

Understanding Vocational Undergraduates' English Learning Needs: Enhancing Professional Communication through AI-Driven Mobile Learning Solutions

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Received: 22 September 2024; Accepted: 12 October 2024; Published: 25 October 2024

Abstract:

This study aims to understand the English learning needs of vocational undergraduate students, with a focus on developing professional communication skills through AI-driven mobile apps. Using qualitative methods such as semi-structured interviews and focus group discussions, the research explores students' experiences, challenges, and expectations when interacting with these AI-powered tools for language learning. The findings reveal a strong demand for personalized, adaptive, and practical learning experiences that align with students' professional aspirations. AI-driven mobile apps provide flexible, interactive content that supports the acquisition of specialized English skills, making them an essential component of vocational English instruction. This study provides valuable insights into optimizing language education for vocational undergraduates by leveraging AI-based mobile learning technologies.

Keywords:

Student Needs Analysis, Vocational English, AI-Driven Mobile Apps, Professional Communication, Career Readiness

1. Introduction

In the context of today's globalized economy, English has emerged as an essential skill for professionals across diverse industries [1]. Vocational undergraduates preparing for careers in fields such as engineering, healthcare, and business require specialized English skills for effective communication in international contexts [2]. Unlike general English, vocational English emphasizes terminology, communication strategies, and professional scenarios that are directly relevant to specific career paths.

However, traditional English instruction frequently fails to address the specialized needs of vocational students. General English courses predominantly emphasize grammar and vocabulary, but seldom address the specialized language skills needed for real-world professional communication [3]. Consequently, vocational students

often struggle to bridge the gap between academic English and the practical communication skills demanded by their future careers.

Recent advancements in artificial intelligence (AI) and mobile technologies present significant potential to transform English language instruction for vocational students [4]. AI-driven mobile applications, for instance, can deliver personalized learning experiences by tailoring content to the specific needs and proficiency levels of individual learners. These tools offer interactive exercises and simulations, enabling students to engage with specialized vocabulary and professional communication tasks in a flexible, accessible format [5].

This study aims to investigate the specific English language learning needs of vocational undergraduates, with a focus on how AI-driven mobile applications can support the development of their professional communication skills. Previous research has demonstrated that technology-enhanced language learning significantly enhances student engagement and learning outcomes [6], yet limited studies have examined the application of AI-driven mobile apps in vocational English instruction. This research seeks to address this gap by providing qualitative insights into how these tools can be optimized for vocational undergraduates.

2. Literature Review

In recent years, research on technology-enhanced language learning (TELL) has grown substantially, particularly focusing on the potential of artificial intelligence (AI) to enhance language acquisition and proficiency. Research has shown that AI-driven mobile applications offer flexible, personalized learning experiences that adapt to individual learners' needs. These applications, typically designed for mobile platforms, include interactive features such as adaptive exercises and personalized feedback, promoting a more learner-centered approach to language acquisition [7]. Mobile-assisted language learning (MALL) is recognized as a crucial area of innovation, especially for vocational students who require the flexibility to study at their own pace, given the practical demands of their career-focused education. However, a gap persists in the literature regarding the specific applications of AI-driven mobile tools in addressing the specialized English language needs of vocational undergraduates.

Vocational students present distinct challenges for language instructors, as their English learning needs are highly specialized, concentrating on industry-specific terminology, communication strategies, and real-world applications [8]. English for Specific Purposes (ESP) has long been regarded as crucial for students entering professional fields, where English serves not only as a general communication tool but also as a critical medium for technical and professional discourse. Arias-Contreras (2022) further emphasized that ESP courses should be designed with specific job-related communication tasks in mind, enabling students to operate effectively within their respective professional contexts [9]. Although ESP frameworks are well-established, the integration of AI-driven tools into these frameworks remains underexplored, particularly regarding how these tools can be tailored to meet the unique needs of vocational undergraduates. Much of the existing research has focused on general ESL learners or tertiary-level students, leaving a gap in studies addressing the vocational sector [10].

The pedagogical implications of integrating AI technologies into language learning environments are significant, offering the possibility to create adaptive learning experiences that simulate professional communication tasks, thereby providing

students with practical, hands-on learning closely aligned with their career objectives [11]. The integration of AI-driven mobile applications into vocational English instruction offers the potential to bridge the gap between theoretical knowledge and practical application by enabling students to engage in interactive tasks that mimic real-world professional scenarios [12]. Nevertheless, empirical research on the long-term efficacy of these tools in enhancing language proficiency and retention, particularly for vocational undergraduates, remains limited. Meng and Sumettikoon (2022) notes that while AI technologies can provide immediate feedback and adapt to a learner's pace, their effectiveness compared to traditional human instruction, particularly in specialized vocational contexts, still requires further investigation [13].

In light of these gaps, this study seeks to provide new insights into the role of AI-driven mobile applications in addressing the specific English learning needs of vocational undergraduates. Although previous research has demonstrated the potential of technology-enhanced language learning tools, current literature insufficiently explores their application in vocational settings, where language learning must align directly with professional competencies. This study aims to address this gap by conducting a qualitative exploration of how AI-driven tools can be effectively integrated into vocational English instruction, offering personalized and relevant learning experiences that enhance professional communication skills.

3. Methodology

This study employs a qualitative research design to explore the English learning needs of vocational undergraduates and the role of AI-driven mobile applications in facilitating the development of their professional communication skills. A qualitative approach was chosen for its suitability in capturing the in-depth experiences, perceptions, and challenges faced by students regarding their use of mobile learning technologies. The study is grounded in an interpretivist paradigm, aimed at understanding participants' subjective experiences and the contextual factors influencing their language learning.

Participants in this study were vocational undergraduates enrolled in professional programs such as healthcare, engineering, and business management at a vocational university in Hainan Province, China. A total of 20 students were recruited through purposive sampling, ensuring that participants represented a diverse range of fields and English proficiency levels. Inclusion criteria required that participants had prior experience with AI-driven mobile applications for language learning. This diversity was essential for generating a comprehensive understanding of the applicability of AI-based tools in addressing the specific English language needs of vocational undergraduates.

Data collection was carried out through semi-structured interviews and focus group discussions. Semi-structured interviews were conducted with 10 students, each lasting approximately 30 to 40 minutes. The interviews were conducted in both English and Chinese to accommodate students' language preferences and ensure the depth of their responses. The interview questions were designed to elicit detailed insights into the students' experiences, challenges, and expectations regarding the use of AI-driven mobile applications for professional English learning. The flexibility of the semi-structured format enabled the interviewer to delve deeper into participants' responses and explore emerging themes.

In addition to the interviews, two focus group discussions were conducted, each involving five participants. Each discussion lasted approximately 60 minutes, encouraging students to share their perspectives in a collaborative setting, fostering a richer exchange of ideas. The focus group discussions were particularly useful in observing how students interacted with one another's insights, offering a more comprehensive view of the common challenges and opportunities presented by mobile-assisted learning tools. Both the interviews and focus group discussions were audio-recorded, transcribed verbatim, and subsequently analyzed.

Thematic analysis, following Braun and Clarke's six-phase approach, was employed for data analysis. Thematic analysis was chosen for its flexibility and its capacity to provide a detailed, nuanced understanding of the data. The process began with data familiarization, wherein the researcher repeatedly reviewed the transcripts to gain an overall sense of the data. Initial coding involved identifying key concepts and patterns within the data, which were subsequently categorized into broader themes. Axial coding was applied to explore relationships between themes, followed by selective coding to refine the central themes emerging from the data. Constant comparison was employed throughout the analysis to ensure that the themes accurately reflected the participants' experiences.

While this study offers valuable insights into the use of AI-driven mobile applications for vocational English learning, several limitations must be acknowledged. The sample size is relatively small and limited to one vocational institution, potentially restricting the generalizability of the findings. Additionally, the study focuses exclusively on students with prior experience in AI-based learning tools, potentially overlooking the perspectives of students less familiar with such technologies. Future research could address these limitations by incorporating a larger, more diverse sample and examining the experiences of students with varying levels of exposure to AI-assisted language learning.

4. Data Collection and Finding

Data for this study were gathered through semi-structured interviews and focus group discussions with vocational undergraduates who had prior experience using AI-driven mobile applications for English language learning. A total of 20 participants were involved in the study, comprising 10 individual interviews and 2 focus group sessions. The interviews offered detailed, personalized insights into each student's experiences with mobile learning tools, while the focus groups facilitated collective reflections and comparisons of their experiences. All data were audio-recorded, transcribed verbatim, and analyzed through thematic analysis. Three major themes emerged from the data: the need for personalized learning experiences, the preference for practical, task-oriented content, and the role of AI in supporting self-directed learning.

Theme 1: Personalized Learning Experiences

One of the most salient themes that emerged from the data was the students' need for personalized learning experiences. Participants consistently emphasized the importance of learning tools that adapt to their individual language proficiency levels and learning paces. Several students highlighted that AI-driven mobile applications provided personalized feedback and recommendations, enabling them to focus on areas requiring the most improvement.

For example, one student stated, “The app knows my weaknesses better than I do. After a few lessons, it automatically provided more practice in grammar, which has always been a challenge for me.” This personalization not only enhanced students’ engagement but also boosted their confidence in tackling challenging aspects of the language. Additionally, students appreciated how these applications adjusted the difficulty of exercises based on their progress, offering more complex tasks as their skills developed. This adaptability, often absent in traditional classroom settings, was identified as a key advantage of AI-driven learning tools.

Theme 2: Practical, Task-Oriented Content

Another key finding was the students' preference for practical, task-oriented learning content aligned with their professional goals. Many participants expressed frustration with traditional English courses that focused on abstract language rules lacking clear connections to real-world applications. In contrast, the AI-driven mobile apps provided students with task-based learning experiences mirroring professional scenarios, such as writing business emails or participating in simulated meetings.

One participant noted, “I found these AI-driven mobile apps much more useful when I could practice English in situations I would actually encounter in my job. The apps enabled me prepare for real tasks, such as making presentations or handling customer complaints.” This emphasis on task-based learning not only made the content more relevant but also motivated students to continue using the applications outside formal class hours. Furthermore, several students mentioned that these apps offered scenarios specifically tailored to their chosen fields, making the learning experience more engaging and directly applicable to their future careers.

Theme 3: Self-Directed Learning and Autonomy

The third theme that emerged from the data was the role of AI in fostering self-directed learning and learner autonomy. Many participants valued the flexibility provided by mobile apps, which enabled them to study at their own pace and schedule. This autonomy was particularly important for vocational students, as they often need to manage their time efficiently between different academic responsibilities and practical training requirements within the school environment. The ability to engage in language practice outside of formal class hours, such as during breaks or free periods, was frequently cited as a significant advantage.

One student remarked, “I like that I can learn whenever I have a few spare minutes. It’s much better than waiting for the next class to practice my English.” The AI-driven features of the applications also enabled students to set their own learning goals and track their progress over time, fostering a sense of ownership over their learning. For vocational students, who may have limited class time dedicated to language learning, this flexibility and self-direction were essential in helping them integrate language practice into their daily academic routines.

Theme 4: Challenges and Limitations of AI-Driven Mobile Learning

Despite the benefits, students identified several limitations of AI-driven mobile applications. A few participants expressed concerns about the lack of direct human interaction, noting that while the AI provided useful feedback, it sometimes lacked the depth and nuance that a human instructor could offer, particularly in complex areas such as advanced grammar or subtle pronunciation issues. As one participant mentioned, “The app gives feedback, but I still prefer asking my teacher something is particularly challenging.” Others mentioned the technical limitations of certain

applications, such as occasional errors in assessing student performance or issues with functionality.

Additionally, some participants pointed out occasional technical limitations, such as errors in speech recognition or performance assessment. One participant commented, “Sometimes the app misunderstands what I’m saying, especially when there’s background noise or when I speak too quickly.” Such issues can disrupt the learning experience and cause frustration, particularly for students working on refining their pronunciation and fluency. While these technical challenges did not overshadow the overall benefits of using AI-driven mobile apps, they highlight the need for further development in areas like speech recognition accuracy and adaptive feedback mechanisms.

5. Conclusion and Discussion

This study examined the English learning needs of vocational undergraduates, with a particular emphasis on the role of AI-driven mobile applications in supporting the development of their professional communication skills. The findings suggest that AI-powered mobile tools effectively meet students’ demand for personalized, adaptive learning experiences. The flexibility and individualization provided by these applications allowed students to target their specific areas of weakness, thereby enhancing their engagement and motivation. This aligns with previous research that underscores the value of personalized learning in enhancing language acquisition, particularly for students with diverse professional needs [14]. However, while AI tools can offer individualized pathways, they lack the capacity to fully replicate the nuanced feedback provided by human instructors, particularly in complex areas such as pronunciation and grammatical structures. This suggests that AI-driven tools should be viewed as a complement to, rather than a replacement for, human-led instruction.

Another key insight from the study is the value students placed on task-based, practical learning experiences that align with their future professional contexts. Many students found traditional language courses to be disconnected from the real-world scenarios they are likely to face in their careers. In contrast, AI-driven mobile applications provided relevant, profession-specific tasks, such as simulating business meetings or writing reports. This emphasis on task-based learning not only increased student engagement but also helped students feel more prepared for their future work environments. These findings align with the principles of English for Specific Purposes (ESP), which emphasize tailoring language learning to the specific demands of learners’ professional environments. The ability of AI-driven applications to simulate such environments offers a distinct advantage, providing students with an opportunity to practice language skills in a manner directly relevant to their vocational goals [15].

The study also highlights how these mobile tools foster self-directed learning, which is crucial for vocational students who often manage multiple academic responsibilities and practical training within the school environment. The flexibility of AI-driven mobile applications enables students to incorporate language learning into their daily routines, including study breaks or independent study sessions outside of formal class hours, fostering greater autonomy and supporting the development of self-regulated learning habits. This is particularly relevant in vocational education, where students frequently engage in independent learning alongside their structured

academic coursework. However, while the flexibility of mobile applications was widely appreciated, several participants noted that the absence of direct human interaction limited the depth of feedback received, particularly in areas such as pronunciation and complex grammar. This suggests that although AI-driven tools are effective in certain domains of language learning, they cannot fully replace the personalized, nuanced feedback offered by human instructors.

Despite these limitations, AI-powered mobile applications offer significant potential for enhancing vocational English education. The study demonstrates that these tools provide a unique combination of flexibility, personalization, and relevance, which traditional classroom settings often struggle to deliver. Nonetheless, the findings underscore the need for a balanced approach, where AI tools are integrated into a broader pedagogical framework alongside human-led instruction. Such a hybrid model could maximize the benefits of personalized, technology-driven learning and interactive, face-to-face teaching, particularly in areas where human input remains indispensable.

In conclusion, AI-driven mobile applications represent a promising innovation in vocational English education. They offer flexible, individualized learning experiences that align with the professional goals of vocational students. However, to fully realize their potential, these tools must be thoughtfully integrated into existing curricula, complementing rather than replacing traditional instructional approaches. The insights from this study contribute to the growing body of literature on AI-enhanced language learning and provide practical recommendations for educators seeking to incorporate these tools into vocational English instruction.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Funding

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

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