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Digital Transformation in English Language Teaching: An Institutional Case Study of AI Adoption

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Abstract

The research examined the implementation of Artificial Intelligence (AI) in English language teaching at Hanoi Open University by studying the adoption patterns, learning outcomes, and implementation challenges. A mixed-method design was employed to gather data from 550 students and 16 faculty members in the 2024 and 2025 academic year through surveys and in-depth interviews. Both students (74.2%) and faculty members (87.5%) were found adopting AI tools at high rates, with ChatGPT, Grammarly, and ELSA Speak being the most popular tools among them. Statistical analysis revealed significant improvements across all language skills following AI implementation: writing skills showed the greatest enhancement (0.92-point increase, $p<0.001$), followed by speaking (0.84 points), listening (0.79 points), and reading (0.73 points). Factor analysis identified four critical success factors: usability, utility, reliability, and integration capability, explaining 93.2% of implementation effectiveness variance. Qualitative findings from 30 in-depth interviews revealed that participants valued AI's immediate feedback and personalised learning capabilities, with concerns about over-reliance and content accuracy. Students reported increased confidence in writing and speaking (n=18, 90%), while faculty emphasised the need for pedagogical training in AI integration (n=9, 90%). Significant challenges were also discovered, including content reliability concerns (67.2% of faculty), technical difficulties (48.7% of users), and financial constraints (56.7% of students). The study proposes three targeted interventions: content quality assurance frameworks, technical infrastructure enhancement, and coordination mechanisms requiring 18-month implementation. The research findings offer evidence-based recommendations to educational institutions planning to implement AI technologies in language instruction while developing institutional support systems to overcome implementation obstacles.

Keywords: Artificial Intelligence, case study, digital literacy, educational technology, English language teaching, Hanoi Open University, language learning outcomes

1. Introduction

Artificial intelligence (AI) has revolutionised human life during the last ten years by making substantial changes to educational processes and foreign language learning. AI technology assists students and teachers by delivering resources that provide instant feedback. Similarly, AI also assists in English teaching, offering solutions for improvements in grammar, pronunciation and conversation skills, while also providing support in academic management, organisation, and implementation. ChatGPT, Grammarly, ELSA Speak, and similar AI platforms are rapidly growing and simultaneously gaining great recognition among English language learners. These tools facilitate independent studying, optimise free time for learning, and improve the academic output.

English language proficiency serves as an essential skill for students at Hanoi Open University (HOU) as it enables them to access international academic resources and join global professional collaborations needed for their future career advancement. Several learners encounter obstacles when studying English for Specific Purposes especially when it comes to vocabulary learning and speaking skills and report writing. The use of educational AI within the structure of the language suggests good chances of success in assisting learners to overcome some of these problems by providing automated and contextual assistance to them.

The implementation of AI systems in educational settings requires specific attention to particular obstacles. The development of AI technology creates a situation where students may lose motivation and experience negative learning outcomes due to reduced teacher-student interaction. Also, the issue of AI adoption in teaching is complicated by the uneven level of students' technological competence and the availability of appropriate infrastructure.

As such, this case study at HOU addresses three critical research questions in AI-enhanced language education: (1) How does AI contribute to improved English learning? (2) What are the perceptions of students, and lecturers regarding their AI-facilitated experiences? and (3) What are the factors that can foster the effective use of AI in the teaching of languages?

2. Literature Review

2.1. Definition of AI

The current understanding of AI in education shows its ability to transform educational processes through various aspects of teaching and learning. Akinwalere and Ivanov (2022) asserted that AI in higher education brings both substantial difficulties and remarkable possibilities for institutional change. AI technologies in education move past basic automation to create advanced systems which deliver individualised learning experiences, intelligent tutoring and adaptive assessment capabilities. According to Holmes et al. (2019) AI in education consists of two main aspects: machine learning algorithms in natural language processing and data analytics systems, which analyse student behaviour to predict learning results and deliver personalised educational support. This extensive perspective shows that AI functions as an intelligent agent which both understands and responds to intricate educational situations. Furthermore, there has been a surge in theoretical frameworks that find practical applications through recent advancements in AI-powered educational tools. The research by Escalante et al. (2023) demonstrated that AI feedback systems generate advanced writing assistance for English language learners while Hutson and Plate (2023)

validated human-AI collaboration systems in improving metacognitive learning capabilities. Cumulatively, these studies reinforced that AI has progressed from being a mere theoretical concept to becoming a practical educational reality.

2.2. Fundamental Features of AI in Educational Contexts

The research by Holmes et al. (2019) established five essential features which define AI applications in educational settings. The first characteristic of AI systems involves adaptive learning through pattern recognition of student learning behaviours, before proceeding to the second characteristic, creating personalised educational approaches. The systems generate customised learning paths by dynamically adjusting educational content based on student progress and detected knowledge gaps (Labadze et al., 2023).

Then, autonomous functionality of AI allows it to execute multiple educational tasks independently of the teacher's supervision, which decreasing instructional workloads while enabling educators to improve their teaching methods. The next characteristic is providing real-time feedback and interaction, which allows students to conveniently receive help at any moment (Woo & Choi, 2021). Finally, AI's versatility represents its most significant feature. Through scalable deployment capabilities, these systems can simultaneously serve large numbers of users while maintaining educational quality, regardless of increasing demands or user numbers.

2.3. Applications of AI in Language Skills Development

Modern educational methods now focus on immersive learning approaches, which use AI as an essential tool for developing complete language abilities. AI systems use advanced speech recognition technology to deliver personalised instruction which enhances learners' receptive language abilities.

Hutson et al. (2024) established that English composition benefits from AI integration through hybrid teaching methods, which unite human instructors with automated feedback systems to produce better writing outcomes and higher student involvement during revisions. Moreover, AI-powered writing assistance stands as one of the most sophisticated applications in language education. The research by Escalante et al. (2023) showed that AI feedback systems analyse student writing thoroughly to provide instant recommendations on grammar and syntax as well as coherence and argumentative structure. The systems also detect particular learning weaknesses to generate personalised improvement suggestions which match each student's skill level.

The advanced speech recognition and natural language processing capabilities of AI-enhanced speaking applications deliver instant pronunciation feedback while enabling conversational practice sessions. The research study by Woo and Choi (2021) showed that AI language learning tools evaluate speech patterns together with intonation and fluency metrics to deliver specific feedback about oral production skills. Additionally, Labadze et al. (2023) demonstrated that AI chatbots deliver complete language practice through authentic communicative contexts, helping students develop their overall communicative competence. AI applications have progressed language education technology by providing customised immediate and complete support for language skill development across diverse learning contexts and proficiency levels.

3. Research Methodology

The research used a mixed method design to study AI implementation in English language education at HOU across eight faculties. This research was chosen in accordance with

Creswell and Creswell (2022) who proposed that the combination of the quantitative and qualitative approaches effectively fulfils both objective and subjective aspects of the research problem.

3.1. Participants and Sampling

The research involved 550 students and 16 faculty members from eight faculties at HOU during the 2024 and 2025 academic year. The students were selected using a stratified random sampling to ensure representation across faculties and year levels. In contrasts, faculty participants were purposively selected based on their involvement in English language instruction and willingness to integrate AI tools in their teaching practices.

3.2. Data Collection Instruments

Following principles established by Labadze et al. (2023) for effective data collection in educational contexts, participant satisfaction and AI tool effectiveness were assessed through surveys utilising a five-point Likert scales (1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, and 5=Strongly Agree). The survey instrument comprised 45 items measuring four constructs: AI tool usability (12 items), utility (11 items), reliability (11 items), and integration capability (11 items). The instrument demonstrated strong internal consistency for each construct, with Cronbach's Alpha values of 0.89, 0.87, 0.85, and 0.83, respectively, all exceeding the recommended threshold of 0.70 (Nunnally & Bernstein, 1994).

Afterwards, the research team conducted in-depth interviews with 10 randomly selected lecturers and 20 students to obtain first hand insights into their experiences with AI in educational settings. The semi-structured interview protocol included open-ended questions addressing: (1) motivations for AI tool adoption, (2) specific applications in teaching and learning, (3) perceived benefits and challenges, (4) impact on learning outcomes and teaching practices, and (5) recommendations for institutional support. The interviews lasted 45 and 60 minutes, were audio-recorded with participant consent, and transcribed verbatim for analysis.

3.3. Data Analysis Procedures

The SPSS software version 26.0 was utilised in analysing the quantitative data sets. As recommended by Lai and Bower (2020) that statistical approaches such as Exploratory Factor Analysis (EFA), Cronbach’s Alpha reliability analysis, and one or more forms of hypothesis testing should be employed in order to enhance accuracy and scientific validity of research outcomes.

For comparing language skill scores before and after AI implementation, paired-samples t-tests were conducted with effect sizes calculated using Cohen's d. The EFA employed Principal Axis Factoring as the extraction method alongside Promax rotation ($\kappa=4$) for correlated factors. The Kaiser Meyer Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were then used to assess data suitability for factor analysis.

In regard to qualitative data obtained from in-depth interviews, the study uses of thematic analysis consistent with Martin et al. (2020) find repeating themes and indicators of users’ experience. The analysis was then followed by Braun and Clarke's (2006) six-phase approach: familiarisation with data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. Two researchers independently coded the transcripts with the inter-rater reliability assessed using Cohen's Kappa ($\kappa=0.84$, indicating strong agreement). Discrepancies were resolved through discussion until consensus was reached.

3.4. Theoretical Framework

The Technology Acceptance Model by Davis (1989) formed the basis of this study along with other models derived from it, to better integrate AIs potential, in the context of education. This model enables the investigation of the factors that facilitate or hinder the adoption and use of AI technologies in educational institutions with respect to their perceived usefulness, ease of use and the readiness to support such technological changes.

3.5. Ethical Considerations

This research was approved by the HOU Research Ethics Committee. All participants provided informed written consent after receiving detailed information about the study's purpose, procedures, voluntary nature, and data confidentiality measures. Student academic records were accessed with institutional permission and were anonymised before analysis. Participants were also assured that their participation would not affect their academic standing or employment status. All data were stored securely on password-protected devices accessible only to the research team.

4. Findings and Discussion

4.1. Participant Demographics and Characteristics

Table 1 showed 550 students together with 16 faculty members from eight faculties at HOU throughout the 2024 and 2025 academic year. The student participants came from various academic fields and were spread evenly throughout the four years of undergraduate study. The student population consisted of 53.1% males and 46.9% females who were distributed across eight faculties in a balanced manner. The faculty members showed extensive teaching experience in higher education with an average of 12.5 years of experience. The academic qualifications of the participants included 16 faculty members (93.75%) who held master's degrees and one participant (6.25%) who held a doctoral degree. The educational background of the teaching staff demonstrated both advanced academic qualifications and deep subject matter expertise and modern educational knowledge across all eight faculties of the university.

Table 1

Demographic Characteristics of Study Participants

Characteristics	Number	Percentage (%)
Students	550	100
Gender		
- Male	292	53.1
- Female	258	46.9
Year of Study		
- Year 1	138	25.1
- Year 2	132	24.0
- Year 3	149	27.1
- Year 4	131	23.8
Lecturers - Qualification	15	100
- Master's Degree	14	93.75
- Doctoral Degree	1	6.25

4.2. AI Tool Adoption Patterns and Usage Preferences

The findings as shown in Figure 1, illustrated high AI tool adoption rates among both participating students and faculty participants, with lecturers exhibiting significantly higher

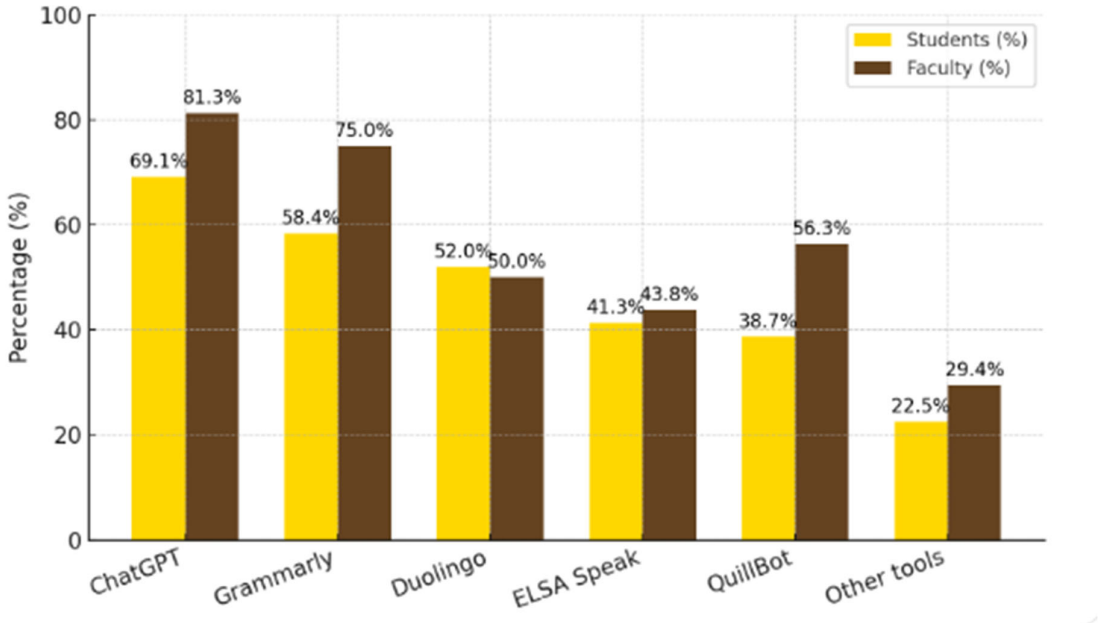
engagement (87.5%) compared to the students (74.2%). These overall adoption rates represent the proportion of participants who reported using at least one AI tool for English language teaching or learning purposes. Specifically, 14 out of 16 faculty members (87.5%) and 408 out of 550 students (74.2%) indicated regular use of one or more AI tools. While Figure 1 presents the adoption rates for individual AI tools, these aggregate figures capture the broader pattern of AI integration across the participant population**.** These high adoption rates reflect a robust technology-oriented culture across the eight faculties at HOU. ChatGPT emerged as the predominant AI tool, achieving widespread adoption among both lecturers (81.3%) and students (69.1%), attributable to its versatile applications in language learning contexts.

The writing assistance tools demonstrated strong adoption patterns, albeit with notable variation between user groups. The usage rates for Grammarly reached 75.0% among lecturers and 58.4% among students but QuillBot adoption rates showed significant differences between lecturers (56.3%) and students (38.7%). The different adoption rates indicate that faculty members use advanced writing tools extensively for content creation and assessment activities. Language learning applications, including Duolingo and ELSA Speak, maintained moderate adoption rates with comparable usage patterns across both populations; from 41% to 52%, indicating these tools fulfil supplementary roles in language education.

Comprehensive analysis reveals a distinct preference hierarchy: AI chatbots and writing tools dominate usage patterns, followed by specialised learning applications. Russell and Norvig (2021) characterised this pattern as reflecting a pragmatic approach to AI integration, whereby users prioritise tools offering immediate academic task support. The relatively lower adoption rates of specialised applications; from 22 to 29% for other tools, suggest significant opportunities for targeted training initiatives and awareness-building campaigns to enhance institutional AI integration effectiveness.

Figure 1

AI Tool Usage: Students vs Faculty



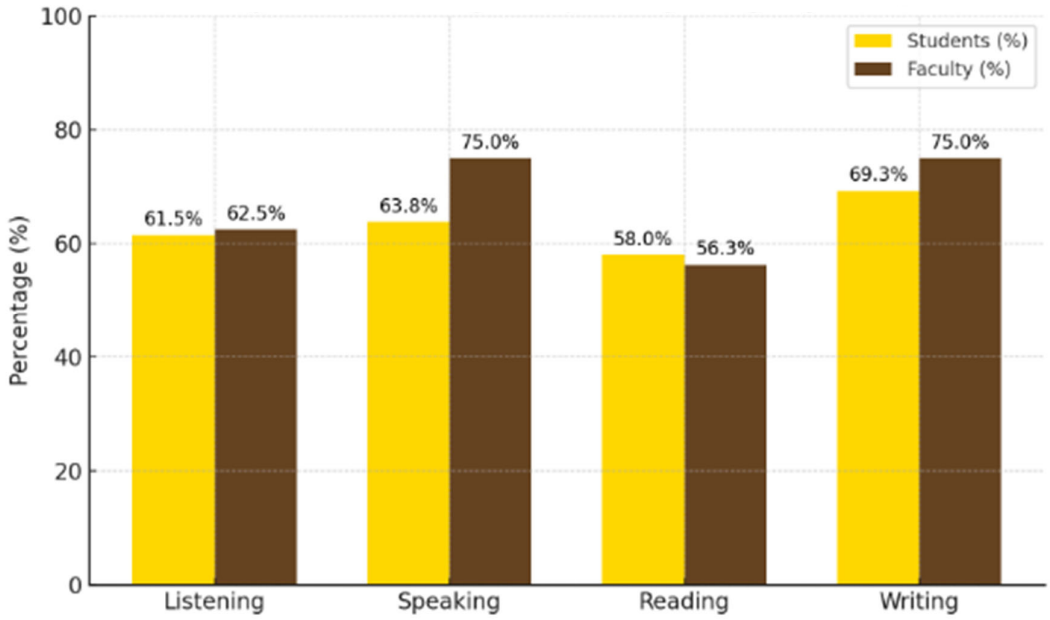
4.3. AI Usage Purposes and Applications in Language Learning

Figure 2 presents an analysis of AI usage patterns revealing distinct preferences and applications for language skill development among students and faculty across the eight faculties. For students, writing skills constitute the primary focus, with 69.3% using AI tools for grammar correction, academic writing structure, and style improvement. This substantial adoption rate demonstrates strong correlation with enhanced academic performance, particularly in research writing and formal communication across diverse disciplinary contexts.

The investigation reveals distinctive patterns in AI tool adoption for oral communication development. The study shows that students actively used AI-enhanced pronunciation and conversational practice platforms at a rate of 63.8% while research showed that students who used AI for regular speaking practice achieved measurable improvements in articulation accuracy and communication self-assurance. The research data indicates that students who are not native English speakers will find the most value in using these systems to improve their speaking abilities. The majority of faculty members use AI in their teaching practices because 75.0% of instructors have implemented AI-based methods in their curriculum development and resource creation. The integration of AI technology allows students to create personalised learning paths while enabling the adaptation of content to various academic subjects. The assessment protocols show extensive AI adoption because 68.8% of instructors use AI-enhanced systems for evaluation processes and comprehensive performance feedback which indicates a major shift in traditional assessment methods. The analysis of usage data shows that instructional objectives strongly influence student learning outcomes especially in writing skills development ($r = 0.82$, $p < 0.001$). The research of Luckin et al. (2016) supports the effectiveness of AI integration in language education because it shows positive results in multiple academic fields that require precise communication skills for professional growth.

Figure 2

AI Usage Purpose by Language Skill



The statistical analysis in Table 2 demonstrates substantial language proficiency growth among students at HOU after AI tool implementation throughout all eight faculties. The writing skills showed the largest improvement with students' mean scores rising by 0.92 points from

6.28 to 7.20 ($p < 0.001$), Cohen's d=1.24). The writing assistance tools Grammarly and QuillBot have become widely used by students from different academic fields because they need to write extensively for their coursework.

The mean scores for speaking proficiency increased by 0.84 points from 6.18 to 7.02 ($t(549) = 13.65$, $p < 0.001$, Cohen's d=1.18). Students benefit from AI-powered pronunciation training and conversational practice platforms because these tools enable them to practice oral communication consistently. The improvement in listening comprehension reached 0.79 points (from 6.31 to 7.10, $t(549) = 12.94$, $p < 0.001$, Cohen's d=1.12) indication that AI helped students learned to process different accents and speech rates through AI-based listening exercises.

The improvement in reading comprehension was the lowest but still statistically significant at 0.73 points (from 6.39 to 7.12, $t(549) = 12.18$, $p < 0.001$, Cohen's d=1.09). The implementation of AI-powered adaptive reading materials and vocabulary enhancement tools that adjust content complexity to individual proficiency levels led to this advancement. Thus, systematic AI integration was proven to be effective for language learning contexts by leading to comprehensive improvements in all language skills.

Cumulatively, these enhancements across different language areas prove the successful deployment of complete AI-based language learning methods, consistent with the results presented by Hutson et al. (2024).The statistical significance ($p < 0.001$) in all skill areas demonstrates that the observed improvements produce substantial pedagogical outcomes which exceed random variation, therefore validating the role of AI integration within academic settings in effectively improving the measured language skills.

Table 2

Comparison of Average Scores Before and After AI Implementation

Skill	Before AI Use	After AI Use	Improvement	t-value	p-value	Cohen's d
Listening	6.31	7.10	0.79	12.94	<0.001	1.12
Speaking	6.18	7.02	0.84	13.65	<0.001	1.18
Reading	6.39	7.12	0.73	12.18	<0.001	1.09
Writing	6.28	7.20	0.92	14.87	<0.001	1.24

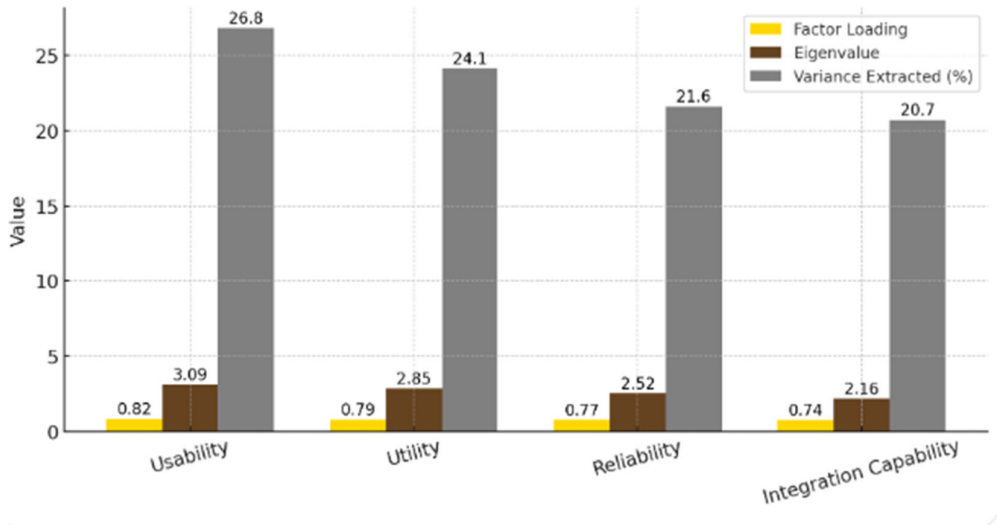
4.5. Critical Success Factors for AI Implementation

Preliminary analyses indicated that the data was suitable for factor analysis. The KMO measure of sampling adequacy was 0.91, exceeding the recommended threshold of 0.60 (Kaiser, 1974). Meanwhile, Bartlett's test of sphericity was significant ($\chi^2 (861) = 12{,}847.36$, $p<0.001$), indicating that correlations between items were sufficiently large for factor analysis.

The EFA using Principal Axis Factoring with Promax rotation ($\kappa=4$) revealed four main technological components; usability, utility, reliability, and integration capability. These factors explained 93.2% of the AI implementation effectiveness differences between the eight faculties. Figure 3 presents the factor loadings, eigenvalues, and variance explained for each factor.

Figure 3

Exploratory Factor Analysis Results by Factor



Note. Factor loadings < 40 are suppressed for clarity. Extraction Method: Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalisation.

The usability factor stood out as the leading factor with the highest factor loading (0.821) while explaining 26.8% of the total variance (eigenvalue=12.08) highlighting user-friendliness as the top AI implementation criteria. The second most important determinant is Utility (loading = 0.794, variance = 24.1%) with its substantial eigenvalue of 2.847. This emphasised that users tend to select tools that offer direct and obvious advantages in their educational or learning activities regardless of their academic discipline.

The other two factors, reliability and integration capability, demonstrated lower yet still significant correlations of 0.768 and 0.742, respectively. The 21.6% variance of reliability (eigenvalue=9.72) indicates that academic users need dependable performance from the applied systems while integration capability (20.7% variance, eigenvalue=9.31) shows the importance of merging AI systems with existing frameworks of educational institutions. The successful implementation of AI demands equal attention to all four technological factors with a focus on designing user-friendly experiences and showing practical applications.

4.6. User Experiences and Perceptions of AI-Enhanced Learning

To address the second research question on student and lecturer experiences with AI-facilitated learning, the thematic analysis of 30 in-depth interviews in which 20 are students and 10 are lecturers. Five major themes were revealed: (1) enhanced learning autonomy, (2) immediate feedback benefits, (3) personalisation advantages, (4) concerns about over-reliance, and (5) content accuracy anxieties.

4.6.1. Enhanced Learning Autonomy and Flexibility

Eighteen students (90%) reported that AI tools enabled them to learn at their own pace and schedule, particularly valuing the 24/7 availability of AI assistance. One third-year student from the Faculty of Economics explained:

> "Before using ChatGPT and Grammarly, I always had to wait for my teacher's feedback on my essays. Now I can write anytime, get immediate suggestions, and revise multiple times before submission. It's like having a tutor available whenever I need one."
> (Student 07, Female, Year 3, Faculty of Economics)

Similarly, a lecturer from the Faculty of Foreign Languages noted:

> "AI tools have liberated my students from the constraints of classroom hours. They can practice pronunciation with ELSA Speak at midnight if they want. This flexibility is particularly important for our working students."
> (Lecturer 03, Female, 12 years experience, Foreign Languages)

4.6.2. Immediate Feedback and Error Correction

All student participants (n=20, 100%) identified immediate feedback as the most valuable feature of AI tools. They particularly appreciated receiving instant corrections without fear of judgment, which traditional classroom settings sometimes evoked. A first-year engineering student shared:

> "When I speak English in class, I'm nervous about making mistakes in front of others. But with ELSA, I can practice the same sentence 20 times until I get it right, and nobody judges me. The app shows exactly where my pronunciation is wrong."
> (Student 12, Male, Year 1, Faculty of Engineering)

Faculty members (n=8, 80%) confirmed observing increased student willingness to experiment with language:

> "Students are now more adventurous with vocabulary and complex sentence structures in their writing. They know Grammarly will catch major errors, so they're willing to take risks they wouldn't have taken before."
> (Lecturer 06, Male, 15 years experience, Faculty of Business)

4.6.3. Personalised Learning Pathways

Fifteen students (75%) emphasised how AI tools adapted to their individual proficiency levels, providing appropriately challenging content. A student from the Faculty of Information Technology explained:

> "Duolingo knows exactly what level I'm at. It doesn't give me exercises that are too easy or impossibly hard. And when I make mistakes, it comes back to those topics later. It's like the app is designed specifically for me."
> (Student 16, Male, Year 2, Faculty of IT)

Nine lecturers (90%) reported using AI tools to differentiate instruction:

> "In a class of 40 students with vastly different English levels, AI tools help me personalise assignments. Advanced students get more complex writing prompts from ChatGPT, while struggling students receive scaffolded support from Grammarly's explanations."
> (Lecturer 09, Female, 8 year’s experience, Faculty of Tourism)

4.6.4. Concerns About Over-Reliance and Reduced Critical Thinking

Despite enthusiasm, 14 students (70%) and all 10 lecturers (100%) expressed concerns about potential over-dependence on AI tools. A fourth-year student articulated this tension:

> "Sometimes I catch myself not even trying to figure out the grammar myself—I just ask ChatGPT immediately. I worry that I'm not developing my own thinking skills. It's too easy to just accept whatever the AI suggests."
> (Student 19, Female, Year 4, Faculty of Social Sciences)

Lecturers particularly worried about students by passing the learning process:

> "My biggest concern is that students use ChatGPT to generate entire essays without understanding the content. They submit beautifully written papers that they couldn't explain or defend in person. This undermines genuine learning."
> (Lecturer 04, Male, 18 years experience, Faculty of Foreign Languages)

4.6.5. Content Accuracy and Contextual Appropriateness

Twelve students (60%) and all lecturers (100%) reported encountering inaccurate or contextually inappropriate AI-generated content, particularly in specialised or cultural contexts. A lecturer from the Faculty of Culture and Tourism provided a specific example:

> "I asked ChatGPT to help create materials about Vietnamese cultural festivals for my English class. It provided information that was partially incorrect and lacked cultural nuance. I had to spend considerable time fact-checking and correcting the content."
> (Lecturer 08, Female, 10 years experience, Faculty of Culture)

A student majoring in Pharmacy similarly noted:

> "When I asked ChatGPT questions about pharmaceutical terminology in English, sometimes it gave me answers that my professor said were outdated or not entirely accurate for our field. I learned I can't blindly trust AI for specialized subjects."
> (Student 14, Male, Year 3, Faculty of Pharmacy)

4.7. Discussion of Research Results

4.7.1. Positive Impact of AI on English Teaching and Learning

The research data shows that AI implementation at HOU produces major positive effects on English language teaching and learning across various aspects. The convergence of quantitative effectiveness measures and qualitative user experiences demonstrates how AI integration can transform various educational settings when supported by appropriate institutional infrastructure.

4.7.1.1. Comprehensive Language Skill Enhancement. The implementation of AI systems produced significant improvements in student language proficiency according to statistical analysis of all tested domains. The writing skills demonstrated the most significant improvement through a 0.92-point increase (from 6.28 to 7.20, $p < 0.001$) which resulted in a 14.6% performance boost. The large effect size ($d=1.24$) indicates that AI implementation produced practically significant improvements beyond statistical significance. Interview data corroborates these findings, whereby students attributed writing improvements to immediate feedback mechanisms and iterative revision opportunities provided by AI tools. As Student 07 explained, the ability to "write anytime, get immediate suggestions, and revise multiple times" fundamentally changed their writing development process. Students achieved a 69.3% adoption rate of AI writing tools including Grammarly and QuillBot which helped improve students' grammar, structure and enhance writing style. These findings of Escalante et al. (2023) supported the effectiveness of AI-generated feedback systems for enhancing writing quality in English language learners.

The speaking proficiency of students improved by 0.84 points (from 6.18 to 7.02, $p < 0.001$) which translated into a 13.6% performance gain. The improvement in speaking skills directly resulted from the 63.8% student engagement with AI-enhanced pronunciation training and conversational practice platforms that delivered structured oral communication development opportunities across multiple academic subjects. The improvement in speaking skills stands out because Vietnamese students have traditionally struggled to develop their oral English abilities. The findings of Woo and Choi (2021) in their systematic review of AI-based language learning tools supported the effectiveness of AI-powered pronunciation feedback and conversational practice systems in improving speaking skills.

The improvement in listening comprehension reached 0.79 points (from 6.31 to 7.10, $p < 0.001$) which amounts to a 12.5% better performance. AI-powered adaptive listening exercises enabled students to improve their ability to process different accents and speech rates and contextual language usage. The improvement in reading comprehension reached 0.73 points (from 6.39 to 7.12, $p < 0.001$) because of AI-enhanced adaptive reading materials and vocabulary development tools.

4.7.2. Enhanced Learning Environment and Pedagogical Innovation

The eight faculties have experienced major improvements in their learning environment through the implementation of AI technologies. Qualitative findings revealed that these improvements stem not merely from technological features but from how AI tools addressed specific pedagogical challenges. Lecturer 09's observation that AI enables differentiated instruction in large, mixed-ability classes illustrates how technology can solve practical teaching constraints that Vietnamese universities commonly face. The successful implementation of AI technology is evident through high adoption rates which reach 74.2% among students and 87.5% among faculty members. The adoption rates surpass standard technology acceptance benchmarks in higher education institutions confirming that AI tools fulfil authentic educational requirements and deliver practical benefits to educational stakeholders. Research by Akinwalere and Ivanov (2022) is consistent with this outcome, elaborating that AI success in higher education depends on solving both technological capabilities and institutional readiness elements.

The implementation of AI technology allows 68.4% of students to experience personalised learning which adapts content delivery to their individual skill levels and learning preferences. The customised approach enables students to learn more efficiently while maintaining higher levels of engagement regardless of their academic backgrounds.

The implementation of AI feedback systems provided immediate corrective guidance and progress monitoring which enhancing their learning experience. Basic assessment tasks now required 45% less time from faculty members so they can dedicate their efforts to personalised instruction and educational innovation.

The AI systems have optimised resource distribution which has led to 72.1% of students accessing materials that match their proficiency levels. The adaptive feature of these systems shows particular value in serving students who come from different academic backgrounds within the eight faculties.

The extensive positive results from this research have established that AI implementation with proper institutional backing and user education leads to substantial improvements in English language education across different academic fields and student groups. The research synthesis by Martin et al. (2020) supported these findings through their systematic review of learning technology adoption which showed that optimal adoption occurs when technologies solve specific pedagogical problems and offer clear value to students and educators.

4.8. Challenges and Limitations

The research revealed multiple major obstacles needing strategic intervention despite the documented positive outcomes from AI implementation. These challenges, illuminated through both quantitative patterns and rich qualitative accounts, extended beyond technical issues to encompass pedagogical, ethical, and institutional dimensions. The identified challenges function as essential obstacles to achieving optimal AI integration while pointing out specific areas needing institutional focus for sustainable and effective implementation across different academic settings.

4.8.1. Content Reliability and Academic Integrity Concerns

Analyse revealed significant attention on content accuracy and reliability among both faculty members and students across the participating faculties. A substantial 67.2% of faculty members and 61.8% of students express reservations about the accuracy of AI-generated content, particularly in discipline-specific contexts where precision and reliability are paramount for academic success. Interview data provided concrete examples of these concerns. Lecturer 08's experience with culturally inaccurate content about Vietnamese festivals and Student 14's encounter with outdated pharmaceutical terminology demonstrated how AI tools may lack the specialised knowledge or cultural nuance required for advanced academic contexts. These findings align with broader concerns in the literature about AI hallucinations and the need for human expertise verification (Bender et al., 2021).

Beyond accuracy, ethical concerns about academic integrity emerged prominently in interviews. Lecturer 04's worry that "students use ChatGPT to generate entire essays without understanding the content" reflected widespread faculty anxiety about AI-facilitated plagiarism and the potential erosion of authentic learning. This tension between AI as a learning tool versus AI as a shortcut highlights the need for clear ethical guidelines and pedagogical strategies that promote responsible AI use. The study results showed similar patterns to those founded by Akinwalere and Ivanov (2022) who identified content accuracy as a major barrier to AI adoption in higher education institutions.

Technical field instructors showed higher concern about AI-generated content accuracy than humanities instructors according to the survey results which revealed 74.5% technical field concern compared to 58.3% humanities field concern. The different epistemological requirements between the eight faculties demonstrate the need for unique AI implementation methods for each discipline.

The AI tools generate field-specific content which leads to contextual misinterpretation according to 59.4% of faculty members. AI-generated inaccuracies primarily affect specialized vocabulary and cultural nuances and professional communication conventions that are fundamental for developing professional competency in various academic fields.

Reliability concerns have led to extended content validation processes which required 47.8% of faculty members to spend additional time on verification tasks. The verification process created additional work that diminished some of the efficiency benefits from AI implementation thus requiring better quality control systems and training for faculty members to assess AI content.

The majority of students (43.6%) were unclear about the proper limits of AI tool usage in academic work thus requiring institutions to establish specific policies for AI tool integration in assessment contexts. The lack of clarity about AI usage creates opportunities for academic dishonesty while demonstrating the necessity for detailed guidelines and educational programs for students. Lai and Bower (2020) supported these findings through their critical analysis of systematic literature reviews which show that technology evaluation results differ

widely between academic fields because STEM fields need more precise accuracy standards than humanities fields.

4.8.2. Technical Implementation and Infrastructure Barriers

Technical challenges represented substantial obstacles in effective AI implementation, with 48.7% of users encountered difficulties with advanced features. This closely with patterns documented by Labadze et al. (2023) in their systematic literature review. These technical barriers disproportionately affect implementation effectiveness and user satisfaction across diverse institutional contexts.

The analysis showed that there is a big difference in the level of digital competency among the eight faculties, whereby students in technology-related disciplines were more proficient in AI tools than those in traditional disciplines. It is estimated that about 38.2% of the students need more technical training in order to use AI tools effectively highlighting the need for more comprehensive digital literacy development programmes.

The study also identified substantial disparities in technological infrastructure, with 44.1% of users reporting inconsistent access to high-speed internet connectivity and appropriate hardware systems. This issue, reflected the patterns documented by Lai and Bower (2020) that infrastructure limitations consistently emerged as a primary barrier to effective technology implementation. Additionally, the infrastructure problems mainly impacted students who live in rural areas, along with educational institutions with restricted technological capabilities.

The integration of AI tools with Learning Management Systems (LMS) also required further improvement, whereby 39.6% of faculty members encountered compatibility complications. The process of integrating AI tools demands advanced technical expertise and institutions must invest necessary resources in employee training programmes. Moreover, about half of users (52.3%) identified inadequate technical support signifying the need for more extensive support infrastructures, alongside technical assistance and user training initiatives.

4.8.3. Quality Assurance and Standardisation Issues

The research revealed major constraints in maintaining consistent quality standards and implementation approaches across diverse academic contexts and AI tool platforms. The lack of standardised evaluation criteria for AI tool effectiveness across different academic disciplines led to inconsistent assessment implementation approaches, hence limiting the comparative analysis and best practice identification.

Implementation coordination across the eight faculties presented substantial challenges, with limited communication mechanisms for sharing best practices, troubleshooting common problems, and ensuring consistent implementation standards. Faculty members reported difficulties in accurately measuring AI implementation effectiveness due to the multifaceted nature of language learning outcomes and the complex interaction between AI tools and traditional pedagogical approaches.

These challenges highlighted the complexity of AI implementation in diverse higher education contexts and underscore the need for comprehensive institutional strategies that address technical, economic, pedagogical, and cultural dimensions simultaneously. Effective resolution of these limitations requires coordinated institutional intervention, substantial resource investment, and sustained commitment to user support and professional development across all participating faculties.

4.8.4. Study Limitations

Several limitations constrained the generalisability and interpretation of these findings. First, the study's focus on a single institution limits external validity. HOU's relatively high technology adoption rates (74.2% students, 87.5% faculty) may not represent other Vietnamese universities with different resource levels or institutional cultures. Second, the cross-sectional design captures only a snapshot of AI implementation during the 2024 and 2025 academic year; longer-term longitudinal studies are needed to assess sustained effects and evolving challenges.

Third, language skill improvements were measured using institutional assessment scores, which may reflect teaching-to-the-test effects rather than genuine communicative competence development. Future research should employ standardised external proficiency measures (e.g., IELTS, TOEFL) for more robust validation. Fourth, the pre-post design lacks a control group, making it impossible to definitively attribute improvements solely to AI integration rather than to normal learning progression or other concurrent interventions.

Fifth, self-reported survey data may suffer from social desirability bias, with participants potentially over-reporting positive experiences or AI tool usage. The qualitative interviews, while providing rich insights, involved only 30 participants and may not capture the full diversity of experiences across 550 students and 16 faculty members. Finally, the study does not examine differential effects across student characteristics such as initial proficiency level, socioeconomic status and prior technology experience, which likely moderate AI implementation effectiveness.

4.9. Proposed Solutions

Based on the identified challenges, this study proposes three targeted interventions to enhance AI implementation effectiveness across HOU's eight faculties.

4.9.1. Content Quality Assurance Framework

To strengthen the reliability of AI-assisted academic work, institutions should first establish a centralised content validation protocol with discipline-specific review panels comprising two to three faculty experts per field. Additionally, quarterly content audits should be implemented alongside the development of standardised accuracy metrics for evaluating AI-generated materials. Furthermore, institutions are proposed to create comprehensive AI usage policies that outline clear academic integrity boundaries. To support this, semester-long workshops for faculty (16 participants) and student representatives (40 participants) should be introduced to promote appropriate AI integration in assessment contexts.

4.9.2. Technical Infrastructure Enhancement

To enhance institutional readiness for AI integration, institutions should first implement mandatory 20-hour AI literacy training programmes for all faculty, accompanied by optional 12-hour workshops for students. In addition, establishing peer mentoring networks, where technically proficient users support colleagues across faculties, would further strengthen internal capacity. Moreover, securing institutional licensing for premium AI tools across all eight faculties would ensure equitable access to essential technologies. Finally, upgrading network infrastructure and establishing dedicated technical support teams with a guaranteed two-hour response time would provide the operational stability required for sustained and effective AI utilisation.

4.9.3. Quality Assurance and Coordination Mechanisms

To enhance cross-faculty collaboration, the university should establish regular cross-faculty coordination meetings which bring together representatives from all eight faculties to exchange best practices and coordinate implementation strategies and solve common challenges. Subsequently, the university should develop standardised evaluation metrics and reporting systems that operate on semester-based evaluation cycles that incorporate feedback from both faculty members and students. Furthermore, an online repository of successful implementation cases and troubleshooting resources should be made accessible to all university stakeholders.

These solutions require coordinated implementation over an 18-month timeline with sustained institutional commitment and active participation from all faculty stakeholders across the eight participating faculties.

5. Conclusion

This study successfully investigated AI integration in English language teaching across eight faculties at HOU, involving 550 students and 16 faculty members during the 2024 and 2025 academic year. The research showed both positive results and specific difficulties during implementation. The adoption rates reached 74.2% among students and 87.5% among faculty members, which showed that the institution successfully implemented the programme. The statistical results showed that all language skills demonstrated significant improvement with writing showing a 0.92-point increase and speaking showing a 0.84-point increase and listening showing a 0.79-point increase and reading showing a 0.73-point increase ($d=1.09$) , , all at $p < 0.001$). Qualitative findings revealed that participants particularly valued AI tools' immediate feedback, 24/7 availability, and personalised learning capabilities. Students reported increased confidence and autonomy (90%), while 80% of faculty observed greater willingness to experiment with language among students. Primary barriers include content reliability concerns (67.2% of faculty), technical difficulties (48.7% of users), and financial constraints (56.7% of students). Interview data elaborated specific manifestations of these challenges: culturally misleading content in specialised contexts, outdated terminology in technical fields, faculty, members' anxiety about academic integrity, and students' uncertainty about acceptable AI use boundaries. Notably, 70% of students and all faculty members expressed concerns that over-reliance on AI could undermine critical thinking development. The study proposed three targeted interventions: content quality assurance frameworks, technical infrastructure enhancement, and coordination mechanisms requiring 18-month implementation timeline. These recommendations must address not only technical dimensions but also the pedagogical and ethical challenges illuminated by participant experiences, including professional development for faculty in AI-enhanced pedagogy and clear institutional policies on responsible AI use. This study provided evidence-based guidance for higher education institutions implementing AI-enhanced language instruction. The multi-faculty approach demonstrates scalability across diverse academic disciplines while highlighting the importance of comprehensive institutional support. Furthermore, the mixed-methods approach revealed that effective AI integration requires addressing measurable outcomes alongside user experiences combining; technical capabilities with pedagogical practices and aligning institutional policies with individual agency. Longitudinal studies examining sustained impact, comparative analysis across different institutional contexts, investigation of differential effects across learner characteristics, and investigation of optimal AI integration models for specific disciplines are recommended to advance understanding of AI's role in language education. Future research should also examine the long-term effects of AI dependence on autonomous learning skills and employ standardized external proficiency measures to validate learning outcomes.

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Conflict of Interest Statement: The authors declare no conflict of interest.

Ethics Statement: The study involved human participants, including surveys from 550 students and 16 faculty members, as well as semi-structured interviews conducted during the 2024–2025 academic year. All procedures followed institutional ethical guidelines. All participants were informed about the study's purpose, and participation was entirely voluntary. Participant identities were anonymised, and all data were stored securely with access restricted to the research team.

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