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Designing an AI-Integrated ESP Course for Flight Attendant Students in China: A Needs Analysis-Based Approach

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ARTICLE INFO	ABSTRACT
	English for Specific Purposes (ESP) plays a pivotal role in flight attendant training, particularly within China's vocational education system. However, designing an effective ESP curriculum that meets industry demands remains a significant challenge. This study investigates flight attendant students target needs and their perceptions of AI-integrated ESP instruction. Data were collected from 184 flight attendant students and 4 ESP teachers at a Chinese vocational university through mixed-methods research (questionnaires and interviews). The result revealed that speaking is the core skill and strong student receptiveness toward AI-enhanced learning tools. These insights inform the development of an AI-enhanced ESP curriculum tailored to aviation professionals' communicative requirements. **Keywords:** Artificial intelligence learning, ESP teaching, needs analysis, flight attendant

INTRODUCTION

English is an important communication tool for flight attendants (Silva, 2023; Supriadi & Purbani, 2019). However, previous research reveals a persistent gap between students' English competence and aviation industry demands, attributing to two key factors: (1) learners' deficiencies in oral proficiency and aviation terminology (Kankaew, 2021), and (2) misalignment between current ESP curricula and industry needs (e.g., overemphasis on grammar rather than scenario-based communication) (Wang., 2023). The emergence of AI presents a potential solution to these challenges. Recent studies demonstrate that AI can improve students' operational ability in English learning (Lee et al., 2023) and enhance learner engagement through personalized feedback (Qi & Chartniyom, 2025; Rukiati et al., 2023). Yet, few investigations have explored its applicability to aviation ESP contexts. This study addresses this gap through a needs analysis framework (Hutchinson & Waters, 1987) to: (1) identify target English competencies for aviation service contexts, (2) diagnose students' current skill deficiencies, and (3) examine preferred learning content and AI-mediated methodologies.

LITERATURE REVIEW

ESP has become a crucial component in the training of flight attendants. The growing demands of the aviation industry necessitate a workforce that is proficient in aviation-specific English (Liu, 2020). However, multiple studies indicate significant gaps in the current ESP teaching framework for flight attendants, highlighting deficiencies in curriculum design and teaching methodology. Zhang (2019) identified a mismatch between exam-oriented curriculum and students' professional communication needs, while Hu et al. (2021) highlighted the inconsistency between classroom instruction and real-world aviation scenarios (e.g., lack of emergency announcement drills). This pain points call for conducting a target needs analysis to align pedagogical approaches with both industry standards and learners' actual challenges. Notably, such gaps coincide with AI technology has shown promise in other ESP domains (e.g., Legal English, Biology and Chemistry English), such as AI-based speech recognition tools for improving pronunciation (Xatamova & Ashurov, 2024) and personalized study tool for checking students' level of knowledge (Bocianu, 2024). However, how students perceive the potential of such technologies in ESP training, particularly their acceptance, engagement and perceived usefulness remains unexplored.

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METHODS

This study employed a convergent parallel mixed method (Ivankova and Creswell, 2009) combining quantitative questionnaire and qualitative interviews to comprehensively examine flight attendant students' needs regarding AI-integrated ESP training. Using purposive sampling (Etikan et al., 2016), 186 flight attendant students from a Chinese university which has a long history in offering this course were invited to complete an 18-item Likert-scale questionnaire assessing their target needs and perspectives toward AI tool. Concurrently, 8 students and 4 ESP teachers were strategically selected to participate in separate semi-structured interviews (30 minutes per session). The student interviews focused on identifying their target needs and their perceptions of AI's potential in ESP learning. The teacher interviews specifically examined target needs from a pedagogical standpoint. Quantitative data were analyzed using SPSS 30.0.0 for descriptive analysis and reliability testing (Cronbach's α = 0.895), while interview transcripts underwent thematic analysis in NVivo 15 (Braun & Clarke, 2006).

RESULTS

4.1 Necessities: pedagogical requirements for effective ESP instruction

4.1.1 ESP Teachers' identification of core competencies

The findings from interviews with ESP teachers indicated that English speaking is regarded as the most crucial skill in the flight attendant context. It was emphasized that improving speaking ability is essential for students to successfully integrate into their future careers as flight attendants but the textbook is not 'real' which is not consistent with the real working scenarios. As one teacher noted: "My friends working in airline companies have told me that speaking is becoming increasingly important for cabin crew as a communication tool with foreign passengers…But the textbook is not practical and including too many theories, students often feel it boring." (ESP Teacher B)

4.2 Gaps: triangulated discrepancies in student self-perception, exam results and interview-revealed shortcomings

4.2.1 Students' self-reported deficiencies and proficiency test results

Students self-assessed their English sub-skills on a 5-point Likert scale (1 = very weak to 5 = very good). As shown in Table 1, receptive skills were perceived as relatively stronger, with listening (Mean = 2.78, SD = 1.05) and speaking (Mean = 2.74, SD = 1.06) ranked highest. In contrast, productive skills demonstrated greater deficits, particularly writing (Mean = 2.39, SD = 0.98), which was rated the weakest competency.

Table 1. Students' perceptions of their English proficiency in language skills (N=186)

English Language Skill	Mean	SD	Rank
Listening	2.780	1.050	1
Speaking	2.737	1.061	2
Reading	2.672	0.978	3
Vocabulary	2.495	0.977	4
Grammar	2.478	1.015	5
Writing	2.392	0.982	6

Note. Very weak=1, weak=2, moderate=3, good=4, very good=5

Additionally, based on China's College English Test Band 4 (CET-4) results, only 26.3% (n = 49) of participants passed this test, while the majority (73.7%) remained below the proficiency threshold. This disparity between self-

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evaluation (moderate self-ratings) and formal assessment outcomes (low pass rates) suggests potential overestimation of language abilities.

4.2.2 Observed discrepancies

Findings from the interviews with ESP teachers and students showed two critical learner deficiencies: oral communication gaps and limited learning motivation. Firstly, consistent with prior findings, oral English predominantly serves as the mode of communication for flight attendants. Nonetheless, this particular skill is precisely what students most conspicuously lack, whether it pertains to occupational scenarios or in academic contexts. This disconnect may stem from what ESP teacher A explained as "lexical knowledge without communicative competence"-the ability to recall terms without developing corresponding interactive skills spontaneously. Secondly, analysis revealed two distinct dimensions of motivational barriers in learning: intrinsic motivation and extrinsic motivation (Ryan and Deci, 2000). As to intrinsic motivation, certain learners have low interest in English learning （"English feels tedious"［Student 7]) and cognitive disengagement （"I struggle to stay awake in class"［Student 2]). As to extrinsic motivation, certain students are unaware of their prospective career paths and not realized the significance of English （"No one explained how English affects job hunting"［Student 1]).

4.3 Wants: students' preferred learning approaches

4.3.1 Preferred learning content

Firstly, findings revealed unanimous consensus among learners about the most importance of English self introduction skill across academic levels (second year students and third year interns). For instance, second year student A explicitly proposing that English self-introduction should be incorporated into the final exam or progress test to motivate students to improve their English skills, emphasizing its direct relevance to airline selection processes.

Additionally, students demonstrated strong demand for more speaking practice in occupational scenarios, especially in English broadcast training. As one student mentioned: "We require more daily conversational drills focused on cabin service protocols, especially dedicated English broadcast training sessions." This view aligns with two ESP teachers who mentioned that while speaking is undeniably essential, individualized feedback remains logistically constrained in large cohorts. One ESP teacher elaborated on the pedagogical challenge: "Although I know the importance of individualized pronunciation feedback, the current cohort size makes personalized instruction logistically unfeasible." This tension between pedagogical ideals and practical constraints highlights a fundamental structural barrier in ESP training programs, underscoring the need for more efficient methods to enhance both language instruction and learning outcomes.

4.3.2 Preferred tasks and activities

Thematic analysis of interview showed a preference for an increased incorporation of oral engagements, collaborative group tasks and role-play exercises with the support of AI technology. Specifically, it revealed three dominant learner preferences regarding AI-enhanced instruction:

(1) a strong demand for oral interaction opportunities via virtual role-play scenarios, such as answering requests with AI passengers ("AI can act as passengers with different accents." [Student 3]; "AI could give me more concise and individualized advice in oral training." [Student 5]).

(2) perceived benefits of collaborative AI-mediated tasks, such as, complete problem-solving tasks in group with AI support ("I think AI could provide a more logical solution in emergency scenarios" [Student 6], with Student 1 further elaborating, "AI's aviation-specific datasets is rich which can generate a more comprehensive and tailored task for my level ").

(3) focus on simulating authentic scenarios, such as simulating turbulence emergencies ("VR is a good way to simulate the real scenario which could create a vivid scenery" [Student 4]; "With AI's like-real simulation, I won't feel nervous and anxious when I am in the real aviation scenario" [Student 7]).

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Notably, while 6 participants enthusiastically emphasized these applications, two students expressed anxiety about over-reliance on technology and explained that human teachers could understand nuances better.

AI INTEGRATED ESP FRAMEWORK

In order to enhance the design and delivery of future ESP courses for flight attendant students, as well as other related educational contexts, this section presents an AI integrated ESP framework after examining flight attendant students' target needs and perceptions toward AI use in ESP.

5.1 Core framework dimensions

a. Objective formulation principle: Align learning objectives with needs analysis involving students, teachers, aviation professionals and other key stakeholders.

Example: To equip flight attendants with the English language skills necessary for effective communication in various flight scenarios with passengers and crew, ensuring safety, customer satisfaction and compliance with international aviation standards.

b. Duration guideline: Duration should be coordinated based on academic calendar, learners' entry-level English proficiency and complexity of selected teaching materials.

Example: The course lasts for one semester with 12 weeks, 32 hours in length, the frequency is 2 sessions per week.

c. Learner profiling: Flight attendant students with minimum CEFR A1-A2 lever in general English.

5.2 Teaching method

Findings reveal learners prefer to combine AI with interactive simulations and real-world scenarios. In response, this guideline adopting teaching approaches that prioritize communicative skill development and the integration of subject-specific knowledge with language learning.

5.2.1 Communicative language teaching (CLT)

CLT emphasizes real-world communicative competence (Sato & Kleinsasser, 1999), particularly vital for flight attendants' unpredictable work contexts. Key applications are illustrated in Table 2:

Table 2. AI integration into CLT for flight attendant English

Teaching phase	AI integration approach	AI tools	Example
Set up aviation scenario	AI generates dialogues with aviation context	ChatGPT+aviation corpus	Passenger requests for changing seat
Assign roles	AI acts a virtual passenger	Voice synthesis (DeepSeek, Doubao)	Passengers with accent or emotional instability
Provide language support	Pronunciation correction, emotional tone adaptation	ELSA Speak, Replika	Provide real time language patterns.
Act out scenario	VR cabin simulations with AI interactions	Meta Quest, gesture recognition software	Transcribe interactions for review

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Assessment	Real-time speech scoring, converts student responses to text with feedback	ELSA Speak, Sensay	Generate performance reports with error correction

5.3 Assessment and evaluation

The assessment and evaluation consists of two sections: spoken-based test, feedback from teachers and students (see Figure 1). Learners' final scores are predominantly determined by spoken test (80%), supplemented by teacher feedback (10%) and peer review (10%).
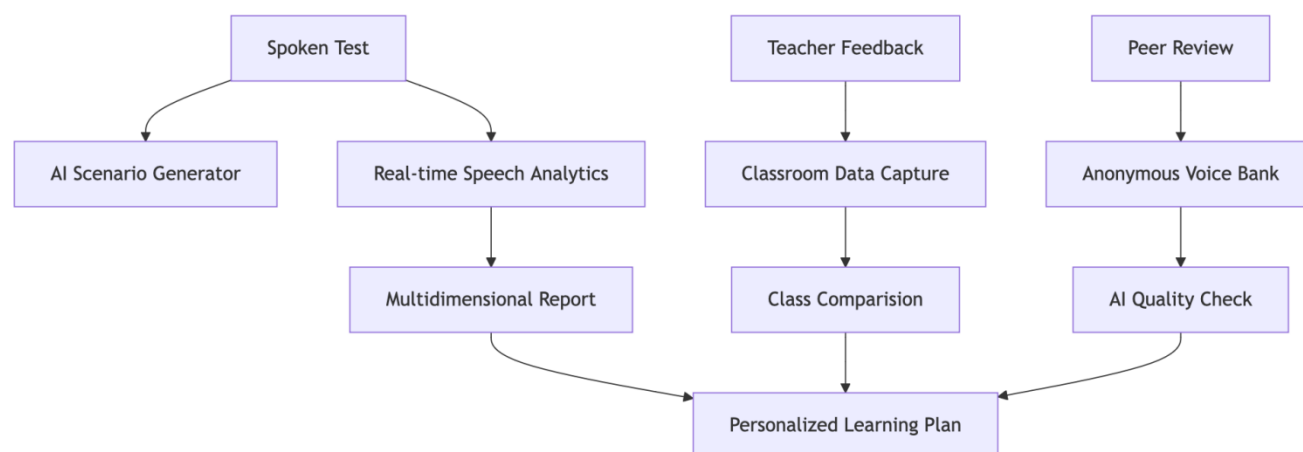

Figure 1: AI integration assessment flowchart for flight attendant English

In the spoken test, AI would generate dynamic aviation scenario, providing prompt diagnostic report on fluency, accuracy and intonation- reducing human teacher's rater bias. For teacher's feedback, AI qualifies longitudinal performance (e.g., class attendance and participation) and benchmarks students against class averages, identifying trends and improvement. In peer review, AI facilitates anonymous evaluations and intelligent peer matching (e.g., pairing high-proficiency students with those needing support) to enhance collaborative learning. Finally, AI generates a personalized learning plan for each student for better language learning (e.g., pronunciation drills for low-scoring students).

CONCLUSION

This study identifies flight attendant students' oral proficiency gaps and motivation challenges, contrasting with their positive reception of AI tools. The proposed AI integrated ESP framework offers an actionable model for addressing these disparities through adaptive, scenario-based training. It provides both immediate pedagogical value and a foundation for future research on technology-mediated language learning in vocational education.

REFERENCES

[1] Bocianu, I. (2024). Advantages and disadvantages of using AI tools for ESP students. In *EDULEARN24 Proceedings* (pp. 10511-10518). IATED. https://doi.org/10.21125/edulearn.2024.2594

[2] Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. https://doi.org/10.1191/1478088706qp063oa

[3] De Carvalho E Silva, A. L. B. (2023). Language Proficiency Test Design for a Group of Military Pilots: Criteria, Construct and Purpose. *Journal of Teaching English for Specific and Academic Purposes, 11*(01). https://doi.org/10.22190/jtesap230120002s

[4] Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American journal of theoretical and applied statistics, 5*(1), 1-4. https://doi.org/10.11648/j.ajtas.20160501.11

[5] Hutchinson, T., & Waters, A. (1987). *English for specific purposes*. Cambridge university press

[6] Hu, X., Ha, B., & Zhang, Y. (2021). Problems and countermeasures in English teaching for flight attendant majors. *Industry of China, 1*, 94-96. https://doi.org/CNKI:SUN:KJHU.0.2021-01-027

[7] Ivankova, N. V., & Creswell, J. W. (2009). Mixed methods. In *Qualitative research in applied linguistics: A practical introduction* (pp. 135-161). Palgrave Macmillan

[8] Kankaew, K. (2021). *Human Capital Development in Services Job: A Modelling from the Airlines Industry*. Horizon Books(A Division of Ignited Minds Edutech P Ltd). https://books.google.com.my/books

[9] Lee, D., Kim, H. H., & Sung, S. H. (2023). Development research on an AI English learning support system to facilitate learner-generated-context-based learning. *Educational technology research and development, 71*(2), 629-666. https://doi.org/10.1007/s11423-022-10172-2

[10] Liu, X. (2020, n.d.). *A study on the reform of English teaching for crew in higher vocational colleges aiming at career development*. Paper presented at the South China Education Informatization Research Experience Exchange Convention, Xiamen, Fujian, China

[11] Qi, Y., & Chartniyom, P. (2025). Research on the impact of AI-generated content technology on design education in Chinese universities. *Journal of Information Systems Engineering and Management, 10*(31s). https://doi.org/10.52783/jisem.v10i31s.5058

[12] Rukiati, E., Wicaksono, J. A., Taufan, G. T. & Suharsono, D. D. (2023). AI on Learning English: Application, Benefit, and Threat. Journal of Language, *Communication, and Tourism, 1*(2), 32－40. https://doi.org/10.25047/jlct.v1i2.3967

[13] Supriadi, M. F., & Purbani, W. (2019). *The prospective flight attendants' English language needs*. In 3rd International Conference on Current Issues in Education (ICCIE 2018) (pp. 344-348). Atlantis Press. https://www.atlantis-press.com/proceedings/iccie-18/125910393

[14] Wang, N. (2023). Research on the Development of Curriculum Standards for Higher Vocational Education in the Context of Professional Upgrading and Digital Transformation:Taking the Higher Vocational Course of Practical English for Cabin Crew as an Example. *Journal of Science and Education, 22*, 148－153. https://doi.org/10.16871/j.cnki.kjwh.2023.22.038

[15] Xatamova, N., & Ashurov, J. (2024). The future of legal English learning: Integrating AI into ESP education. *SPAST Reports, 1*(7). https://doi.org/10.69848/sreports.v1i7.5081

[16] Zhang, J. (2019). *Research on current situation and countermeasures of training flight attendant professionals in Tianjin universities* (Master's thesis). Tianjin Vocational and Technical Normal University, Tianjin, China