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University Students‘ Perceptions of a CLIL-Based Model in Teaching Aviation English Listening Skills

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Abstract

The study investigates university students’ perceptions of using a Content and Language Integrated Learning (CLIL) approach to teach Aviation English listening skills. The integration of content knowledge with language acquisition has gained momentum in English for Specific Purposes (ESP), particularly in aviation training contexts where comprehension of authentic radio communication is critical. A mixed-methods design was employed involving 60 undergraduate aviation students at Georgian Aviation University. Data were collected via a perception questionnaire and semi-structured interviews. Results indicate that the majority of students viewed the CLIL-based approach positively, citing improved comprehension, contextual vocabulary acquisition, and increased engagement. However, some challenges, such as cognitive overload and unfamiliar terminology, were also reported. These findings suggest that CLIL holds promise for Aviation English instruction, provided that pedagogical scaffolding and appropriate materials are in place.

Keywords: English for Specific Purposes, listening skills, student perceptions, higher education

Introduction

In the context of international aviation, language is not merely a medium of communication but a critical safety tool. Miscommunication

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between pilots and air traffic controllers has been consistently identified as a contributing factor in numerous aviation incidents and accidents worldwide (Eurocontrol, 2019).

Given the inherently multinational and multilingual nature of aviation operations, English has been standardised as the global language for radiotelephony communication. This decision, formalised by the International Civil Aviation Organisation (ICAO), was driven by the need to ensure clear, concise, and universally intelligible communication between pilots and air traffic controllers across borders. English serves as the linguistic bridge in international aviation, playing a vital role in maintaining operational safety, efficiency, and coordination in an environment where miscommunication can have critical consequences.

However, despite the formal adoption of English as the lingua franca of aviation, implementing effective language use in practice has proven to be complex and uneven. One key challenge lies in the fact that many aviation professionals are non-native speakers of English, operating in high-stakes, fast-paced environments that demand both accuracy and fluency under pressure. The communicative demands of aviation go beyond routine phraseology; they also involve the use of plain English, especially in non-standard or emergency situations where phrasebook responses are insufficient. This dual demand, mastery of standard phraseology and proficiency in plain English, has revealed significant gaps in both training and assessment. ICAO's Language Proficiency Requirements (LPRs), introduced in response to a series of accidents and incidents attributed to language barriers, were a major step forward in addressing safety concerns. Yet, ICAO did not provide a single, standardised test. Instead, it left the responsibility for developing or adopting assessment systems to individual countries. As a result, national-level testing frameworks vary widely in their design, content, and alignment with real-world communication scenarios.

This inconsistency has raised serious concerns regarding the validity and fairness of Aviation English assessments. In some contexts, tests may not accurately reflect the operational linguistic demands faced by aviation professionals, particularly under pressure, in non-routine events, or when communicating with interlocutors of varying proficiency levels and accents. Furthermore, there is limited empirical research examining how national testing systems correspond to authentic radiotelephony communication. This is particularly true in countries like Georgia, where no prior studies have systematically explored the relationship between language testing and actual controller performance in operational contexts.

Consequently, Aviation English has evolved into a vital branch of English for Specific Purposes (ESP), with particular emphasis on listening comprehension in radiotelephony communication (Moder, 2013). Despite

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traditional methods of language instruction, many learners struggle to process real-time, high-pressure, and often abbreviated radiotelephony exchanges (Kim & Elder, 2009). Air traffic controllers and pilots may perform effectively in real operational environments, demonstrating fluency, accuracy, and situational awareness, yet still struggle to achieve passing scores on formal language proficiency tests. This discrepancy stems from a fundamental misalignment between the communicative practices used in authentic air-ground interactions and the constructs measured by many assessment tools. In particular, such tests often emphasise the use of plain English at the expense of standard ICAO phraseology, which dominates actual radiotelephony exchanges. In the Georgian context, even highly experienced pilots and controllers are frequently required to retake the language proficiency examination, not due to a lack of operational competence, but because the current assessment framework does not accurately reflect the linguistic realities of their daily professional communication.

In response to these limitations, this study investigates the applicability of Content and Language Integrated Learning (CLIL) as an instructional strategy for enhancing listening comprehension in Aviation English. CLIL is an educational approach that integrates the learning of subject-specific content with the simultaneous development of language skills, grounded in the idea that language acquisition is more effective when embedded in meaningful, cognitively demanding, and context-relevant tasks (Coyle, Hood, & Marsh, 2010). Although originally implemented within European secondary education systems, CLIL has increasingly gained traction in higher and vocational education settings, owing to its potential to replicate the linguistic and cognitive demands of authentic professional environments (Dalton-Puffer, 2011; Lasagabaster & Sierra, 2009).

The findings apply CLIL methodology to the redesign of an Aviation English listening course taught at the university level. Over a 14-week semester, the listening component was restructured to align with the 4Cs framework (Coyle et al., 2010):

- Content (e.g., aviation procedures and terminology)
- Communication (e.g., radiotelephony language functions)
- Cognition (e.g., problem-solving based on incident reports), and
- Culture (e.g., understanding international communication norms).

Authentic materials were central to this design, including ICAO radiotelephony transcripts, real ATIS (Automatic Terminal Information Service) recordings, and narrative reports of aviation incidents. These were used as the basis for weekly listening tasks and discussions, ensuring both linguistic and procedural relevance.

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While CLIL's benefits have been explored in fields such as business, tourism, and science education, its application in the context of aviation training remains under-researched, particularly regarding learner engagement and outcomes. Importantly, no prior studies to date have closely examined aviation students' perceptions of CLIL-based listening instruction, despite the recognised impact of learner attitudes on language acquisition success (Dörnyei & Ushioda, 2011).

The study aims to resolve this gap by examining university-level aviation students' perceptions of a CLIL-based instructional model used in an Aviation English listening course. The goal is to evaluate the pedagogical effectiveness of CLIL in enhancing listening comprehension of radiotelephony communication and to assess its perceived benefits and challenges from the learners' perspective.

To address the issues mentioned above, the research aims to answer the following research questions:

- How do aviation students perceive the integration of CLIL in an Aviation English listening course?
- What impact does CLIL-based instruction have on students' confidence and ability to comprehend radiotelephony communication?
- What pedagogical benefits and limitations are associated with using CLIL in Aviation English training?

Methods

To investigate the effectiveness of a CLIL-based Aviation English listening course and understand learners' perceptions of it, the present research adopted a mixed-methods design. This methodological approach integrates both quantitative and qualitative data collection and analysis, enabling a more comprehensive exploration of the research problem. As Creswell and Plano Clark (2018) argue, mixed-methods research is particularly well-suited to educational settings where complex, multifaceted phenomena, such as language learning and pedagogical innovation, require both statistical generalisation and contextual interpretation.

The choice of a mixed-methods approach was justified by the dual nature of the research objectives: to measure students' perceived improvements in listening comprehension and language confidence (quantitative), and to gain deeper insights into their attitudes, motivations, and reactions to CLIL-based instruction (qualitative). According to Banegas (2012), research into CLIL, which blends content and language learning, benefits from methodologies that not only reveal patterns and outcomes but also uncover learner experiences and cognitive-emotional responses. A strictly quantitative design would have risked overlooking these important qualitative dimensions, while a purely qualitative approach would have limited the

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generalizability of findings to broader educational contexts. Therefore, the integration of statistical analysis and thematic interpretation allowed for a richer, more balanced understanding of the pedagogical intervention's impact. The study involved 60 undergraduate pilots enrolled in the second year at Georgian Aviation University, Tbilisi. All participants had completed a minimum of two semesters of aviation theory instruction. This ensured that students were familiar with key operational and procedural concepts relevant to the course content.

All participants had achieved a B2 level of English proficiency according to the Common European Framework of Reference for Languages (CEFR). This level was considered appropriate for participation in the CLIL-based curriculum, as it represents an upper-intermediate command of English, enabling learners to engage with complex language input while acquiring domain-specific terminology (Council of Europe, 2001).

Participation in the study was voluntary and anonymous. Informed consent was obtained from all students before data collection, and the research protocol adhered to the ethical guidelines established by the university's academic research committee.

Results

Characterisation of the Experimental and Control Groups by Special Questionnaire Data

The participants in this study were 60 second-year aviation students from Georgian Aviation University, all of whom had a B2 level of English and 1–5 years of aviation experience. Participants were randomly divided into two equal groups: experimental and control. As shown in Table 1, age distribution was statistically similar across groups, indicating group comparability and eliminating demographic age as a confounding variable.

Table 1. Age distribution in the control and experimental groups

Age Group	Experimental Group N (%)	Control Group N (%)	χ^2-test, p
18–25	24 (80.0%)	22 (73.3%)	0.37; p = 0.545
26–35	6 (20.0%)	8 (26.7%)	

Language exposure also showed no statistically significant difference (Table 2). While the control group reported slightly more frequent use of English. The difference was not significant, supporting the conclusion that both groups had comparable baseline exposure to English in aviation settings.

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Table 2. Language exposure in the control and experimental groups

Frequency of English Use	Experimental Group N (%)	Control Group N (%)	χ^2-test, p
Often	18 (60.0%)	23 (76.7%)	1.89; p = 0.169
Always	12 (40.0%)	7 (23.3%)	

Participants were asked to identify major challenges in understanding aviation communication. As shown in Table 3, all participants in both groups reported "understanding accents" as a challenge. However, significantly more participants in the control group identified „speed of communication" and „clarity of messages" as problematic ($\chi^2 = 6.56$, $p = 0.011$ for both), suggesting that the experimental group benefited from greater clarity and pacing in communication. No statistically significant differences were observed regarding technical vocabulary.

Table 3. Challenges in listening comprehension

Challenge Identified	Experimental Group N (%)	Control Group N (%)	χ^2-test, p
Understanding accents	30 (100.0%)	30 (100.0%)	N/A
Speed of communication	24 (80.0%)	30 (100.0%)	6.56; p = 0.011
Technical vocabulary	12 (40.0%)	15 (50.0%)	0.60; p = 0.440
Clarity of messages	24 (80.0%)	30 (100.0%)	6.56; p = 0.011

As indicated in Table 4, most participants rated their listening skills as "fair" before the intervention. No significant differences were observed between groups ($\chi^2 = 0.79$, $p = 0.375$), establishing a baseline for further comparison.

Table 4. Self-assessment of listening skills

Self-Assessment	Experimental Group N (%)	Control Group N (%)	χ^2-test, p
Poor	9 (30.0%)	6 (20.0%)	0.79; p = 0.375
Fair	21 (70.0%)	24 (80.0%)	

The data in Table 5 reveal striking differences in material preferences. All experimental group participants endorsed the use of authentic ATC recordings (100%), while none in the control group did, a highly significant difference ($\chi^2 = 59.00$, $p < 0.001$). Multimedia presentations and role-playing exercises were also significantly more preferred by the experimental group, suggesting strong engagement with CLIL-based methods.

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Table 5. Preferred types of listening materials

Type of Material	Experimental Group N (%)	Control Group N (%)	χ^2-test, p
Real-life ATC recordings	30 (100.0%)	0 (0.0%)	59.00; $p < 0.001$
Multimedia presentations	18 (60.0%)	0 (0.0%)	25.29; $p < 0.001$
Role-playing exercises	30 (100.0%)	28 (93.3%)	2.03; $p = 0.154$

Perceptions of the CLIL-Based Instruction (Experimental Group Only)
Participants in the experimental group completed a follow-up self-assessment on the effectiveness of the CLIL approach. The findings are detailed in Tables 6-10.

A majority of the research participants rated the CLIL approach as "effective" (70.0%), with 30.0% choosing "very effective", and no negative responses ($\chi^2 = 4.80$, $p = 0.029$), as shown in Table 6.

Table 6. Perceived Effectiveness of the CLIL Approach

Rating	Experimental Group N (%)	χ^2-test, p
Very Effective	9 (30.0%)	4.80; $p = 0.029$
Effective	21 (70.0%)	
Neutral	0 (0.0%)	
Ineffective	0 (0.0%)	
Very Ineffective	0 (0.0%)	

Research participants identified the dual focus on content and language (60.0%) and practice with real-world aviation scenarios (40.0%) as the most beneficial aspects (Table 7). Other components, such as peer collaboration or vocabulary instruction alone, were not highlighted. However, the differences among preferences were not statistically significant ($\chi^2 = 1.20$, $p = 0.273$).

Table 7. The most beneficial aspects of CLIL

CLIL Component	Experimental Group N (%)	χ^2-test, p
Content + Language Integration	18 (60.0%)	1.20; $p = 0.273$
Real-World Aviation Scenarios	12 (40.0%)	
Vocabulary Learning	0 (0.0%)	
Peer Collaboration in English	0 (0.0%)	

Following the CLIL-based training, 70.0% of the research participants reported that their ability to comprehend and respond to ATC communications had "significantly improved," while 30.0% noted "somewhat improved" ($\chi^2 = 4.80$, $p = 0.029$). None reported worsening or no change.

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Table 8. Perceived improvement in ATC communication

Response	Experimental Group N (%)	χ^2-test, p
Significantly Improved	21 (70.0%)	4.80; p = 0.029
Somewhat Improved	9 (30.0%)	
No Change	0 (0.0%)	
Worsened	0 (0.0%)	

After the CLIL course, participants' self-assessments improved markedly, with 80.0% rating their listening skills as "Good" and 20.0% as "Very Good" (Table 9), showing a statistically significant improvement from baseline ($\chi^2 = 10.80$, $p = 0.001$).

Table 9. Self-assessment of listening skills after CLIL course

Rating	Experimental Group N (%)	χ^2-test, p
Good	24 (80.0%)	10.80; p = 0.001
Very Good	6 (20.0%)	
Poor/Fair/Excellent	0 (0.0%)	

The data in Table 10 provides a comparative analysis of self-assessments before and after the CLIL intervention. At baseline, no participant rated themselves above "fair," whereas post-training, none rated themselves below "good." This difference was statistically significant ($\chi^2 = 4.80$, $p = 0.029$), supporting the effectiveness of CLIL in improving perceived listening ability.

Table 10. Pre- vs. Post-Intervention Comparison

Rating	Before N (%)	After N (%)	χ^2-test, p
Poor	9 (30.0%)	0 (0.0%)	4.80; p = 0.029
Fair	21 (70.0%)	0 (0.0%)	
Good	0 (0.0%)	24 (80.0%)	
Very Good	0 (0.0%)	6 (20.0%)	

Research participants were asked to self-assess their level of comfort with various components of ATC communication after completing the CLIL-based training. Responses were rated on a 5-point Likert scale (1 = Not comfortable at all; 5 = Very comfortable). As presented in Table 11, the majority of participants reported being "comfortable" (score 4) with each listed element.

Recognising technical vocabulary, processing rapid speech, deciphering complex instructions, and comprehending urgent messages were each identified by 80.0% of participants as elements with which they felt significantly more comfortable ($\chi^2 = 10.80$, $p = 0.001$).

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For understanding different accents, 60.0% rated their comfort level as 4, and 40.0% as 5, but this distribution was not statistically significant (χ^2 = 1.20, p = 0.273), suggesting that accent variation remains a relatively persistent challenge.

Table 11. Comfort Levels with Elements of ATC Communication (Experimental Group Only)

ATC Communication Element	Score	N (%)	χ^2-test, p
Understanding different accents	4	18 (60.0%)	1.20; p = 0.273
	5	12 (40.0%)	
Recognizing technical vocabulary	4	24 (80.0%)	10.80; p = 0.001
	5	6 (20.0%)	
Processing rapid speech	3	6 (20.0%)	10.80; p = 0.001
	4	24 (80.0%)	
Deciphering complex instructions	4	24 (80.0%)	10.80; p = 0.001
	5	6 (20.0%)	
Comprehending urgent/critical messages	4	24 (80.0%)	10.80; p = 0.001
	5	6 (20.0%)	

Participants were asked to evaluate the overall effectiveness of the CLIL method in learning aviation English. As shown in Table 12, the vast majority (70.0%) rated it as "Effective," and 30.0% as "Very Effective," with no neutral or negative responses. This difference was statistically significant (χ^2 = 10.80, p = 0.001), indicating a strong positive perception of the CLIL model among participants.

Table 12. Overall effectiveness of the CLIL approach

Response	N (%)	χ^2-test, p
Very Effective	6 (30.0%)	10.80; p = 0.001
Effective	24 (70.0%)	
Neutral	0 (0.0%)	
Ineffective	0 (0.0%)	
Very Ineffective	(0.0%)	

The following were identified by the research participants as the most beneficial features of the CLIL-based instruction:

- Exposure to real-world aviation contexts
- Listening practice with authentic audio materials
- Contextualised learning of technical vocabulary
- Interactive speaking and listening activities
- Peer collaboration in English

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Participants were asked to rate their level of agreement with several statements about the CLIL experience using a 5-point Likert scale (1 = Strongly Disagree; 5 = Strongly Agree). The results, presented in Table 13, reveal robust support for the CLIL model.

100.0% of participants agreed (score 4) that they now feel more confident responding to ATC communication.

80.0% agreed that the CLIL approach improved their understanding of aviation-specific terminology ($p = 0.001$).

70.0% found simulated real-life scenarios effective in improving listening skills ($p = 0.029$).

90.0% agreed that integrating content and language learning made lessons more engaging ($p < 0.001$).

Table 13. Agreement with Key Statements Regarding CLIL-Based Learning

Statement	Score	N (%)	χ^2-test, p
Improved understanding of aviation-specific terminology	4	24 (80.0%)	10.80; p = 0.001
	5	6 (20.0%)	
Confidence in responding to ATC communication	4	30 (100.0%)	N/A
Simulated real-life scenarios improved listening	4	21 (70.0%)	4.80; p = 0.029
	5	9 (30.0%)	
Integration of content and language was engaging	4	27 (90.0%)	19.20; p < 0.001
	5	3 (10.0%)	

Perceived Challenges, Recommendations, and Learner Feedback

To gain deeper insight into learners' experiences with the CLIL approach, participants were asked to provide additional feedback on the most challenging aspects, recommended improvements, and general perceptions. The qualitative data were quantified and are presented in Charts 1–3.

- Among the most frequently cited challenges, two key aspects emerged:
- Rate of speech (20%)
- Understanding different accents (20%)

These findings indicate that despite the overall effectiveness of the CLIL-based instruction, learners continued to struggle with certain phonological features of spoken English, particularly in the context of fast-paced and accent-varied ATC communication. This is consistent with broader research that identifies speech rate and accent variability as persistent barriers to listening comprehension in aviation English contexts.

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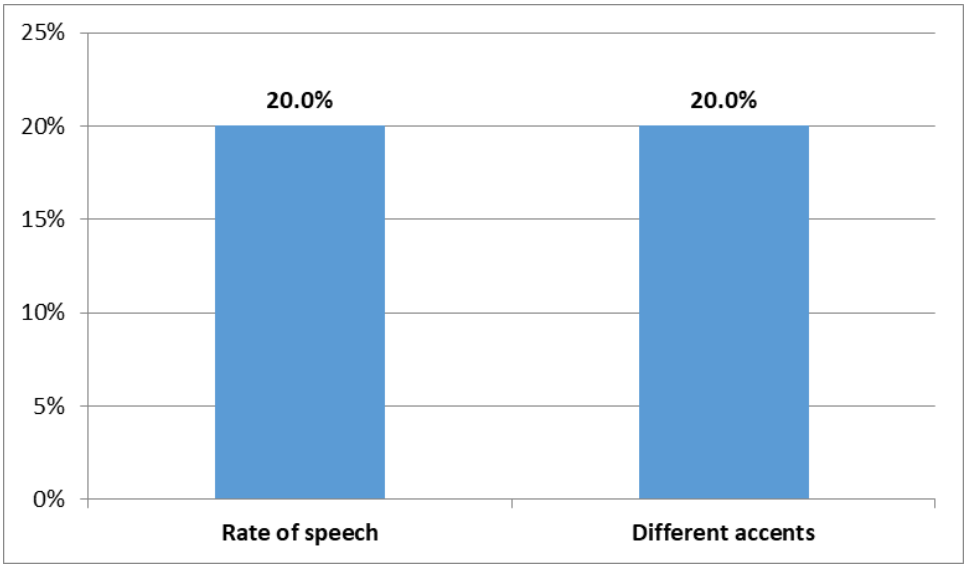

Figure 1. Challenges in CLIL-Based Listening Instruction

When asked what could further enhance their listening skills in aviation communication, 30% of participants recommended incorporating more real-life scenarios. This reflects a preference for authentic, context-based learning, where exposure to realistic operational settings reinforces the practical application of both language and procedural knowledge. It also supports the notion that scenario-based learning increases learner engagement and mirrors the real-time demands of aviation communication.

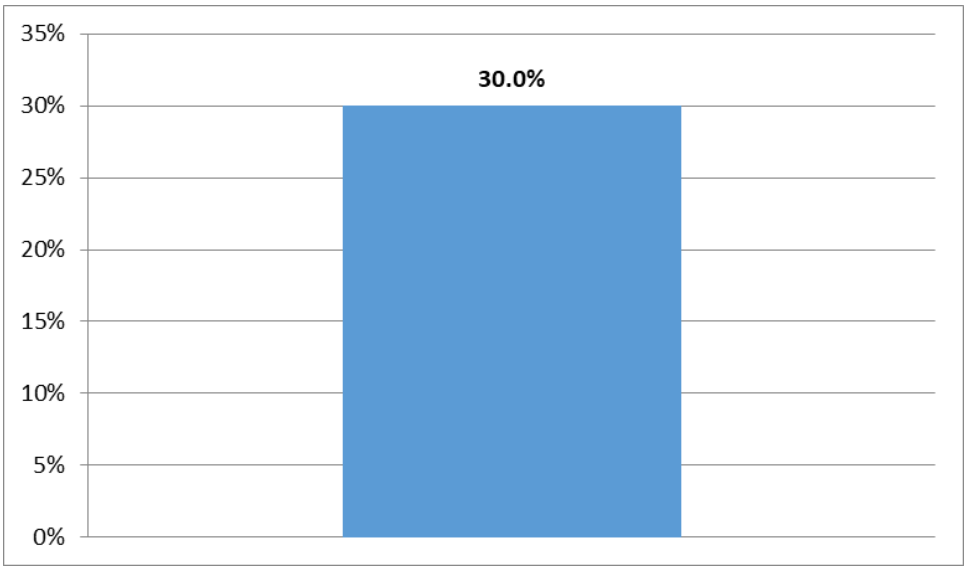

Figure 2. Additional resources or methods recommended for further enhancing listening skills in aviation English

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Participants' general comments further affirmed the value of the CLIL approach:

- 30% described it as a useful approach to learning,
- 20% found it beneficial overall.

These responses emphasise learner satisfaction and confirm that the CLIL model was perceived not only as pedagogically effective but also personally meaningful and relevant to their professional needs. Such feedback reinforces the quantitative findings reported earlier, including significant improvements in listening comprehension, confidence, and engagement.

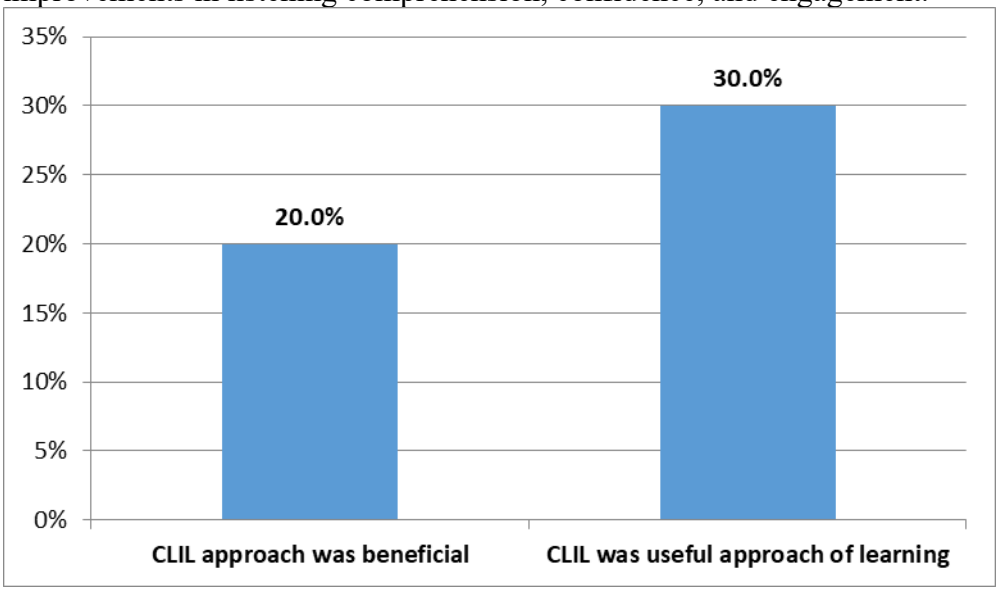

Figure 3. Suggestions about the CLIL approach in aviation English training

The qualitative data gathered through semi-structured interviews offered nuanced insights into learners' perceptions of the CLIL approach in the context of Aviation English instruction. Thematic analysis revealed four dominant themes: increased motivation, authenticity of learning, the importance of scaffolding, and the pedagogical role of the teacher. Each theme contributes to a more comprehensive understanding of how CLIL impacts learners' engagement, confidence, and overall experience.

Table 14. Interview results

Interview Question	Theme	Purpose of the Question
1. How did you feel about learning Aviation English through both language and content?	General CLIL perception	To gauge overall attitude toward the CLIL approach
2. Did the aviation-related content make the lessons more interesting or motivating for you? Why or why not?	Increased motivation	To assess the influence of content relevance on learner motivation

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Interview Question	Theme	Purpose of the Question
3. Can you describe a moment when you felt more engaged because the content related to your future career?	Increased motivation	To identify specific instances of increased engagement linked to professional goals
4. How did the Aviation English course help you feel more prepared for real-life communication in the cockpit or control tower?	Authenticity of learning	To determine how students perceive the practicality of the material
5. Were the listening tasks and dialogues realistic? How did they affect your confidence in using English in professional settings?	Authenticity of learning	To evaluate how realism in materials contributed to learner confidence
6. What kinds of materials (e.g., recordings, case studies, phraseology) did you find most useful or authentic?	Authenticity of learning	To identify which resources students perceived as most beneficial
7. Did you ever struggle to understand the content? If so, was the difficulty more with the aviation topic or the English language itself?	Scaffolding needs	To distinguish between language and content-based difficulties
8. What kind of support (e.g., visuals, explanations, group work) helped you better understand complex topics?	Scaffolding	To explore the effectiveness of scaffolding strategies used
9. Were there moments when you wished you had more background knowledge before starting a lesson?	Scaffolding	To identify the need for pre-teaching or prior knowledge activation
10. Do you think your teacher's knowledge of aviation was important for your learning experience? Why or why not?	Collaboration / pedagogical implication	To explore the role of teacher expertise and interdisciplinary collaboration
11. How would you compare this CLIL-based Aviation English course to previous general English courses you've taken?	Comparative perspective	To contrast CLIL-based instruction with traditional approaches
12. If you could change one thing about the course, what would it be and why?	Learner-centered feedback	To allow open-ended, constructive suggestions for course improvement

A recurring theme among participants was a significant increase in motivation driven by the integration of aviation-specific content. Students frequently emphasised the alignment between lesson materials and their professional aspirations. For example, Participant 4 stated, "It felt like we were preparing for real situations, not just exams." This quote reflects a transformation in how students perceive the purpose of language learning - from a purely academic task to a practical skill directly tied to real-world applications. Similarly, Participant 11 noted that the course content was

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closely related to pilot training, which "gave me more reason to pay attention." These findings support key principles of CLIL, particularly Coyle et al.'s (2010) 4Cs Framework, where content and cognition jointly stimulate learner engagement by providing a sense of purpose and professional direction.

Students consistently valued the realistic nature of the course materials, especially listening activities based on ICAO-standard radiotelephony and aviation-related scenarios. Participant 7 remarked, "The recordings and tasks felt real. I could imagine myself in the cockpit or at the tower," illustrating the positive effect of situated learning environments. Such authenticity not only made lessons more engaging but also bolstered learners' confidence in using English in actual aviation contexts. Participant 10 added that the course made him feel as if he were "already part of the aviation world." These responses confirm that authenticity, a key element of CLIL, facilitates the development of communicative competence within specific disciplinary fields. It also aligns with the concept of situated cognition, where knowledge is constructed more effectively in realistic, contextualised settings.

While overall perceptions were positive, some students reported challenges understanding aviation-related content, not due to linguistic barriers, but due to limited prior knowledge of aviation systems and procedures. Participant 9 shared, "Sometimes I felt lost when I didn't understand the aviation part, not the English." This distinction is critical in CLIL contexts, where learners face a dual cognitive load. Similarly, Participant 5 highlighted the need for more background on aircraft systems, suggesting gaps in domain knowledge could hinder comprehension. These comments emphasise the necessity of scaffolding, including visual aids, background readings, and simplified explanations. Participant 12 remarked that "it helped when we had diagrams or visuals. Without them, it was harder to follow," pointing to the importance of multimodal support strategies. These findings reinforce CLIL's requirement for dual focus (content + language) and suggest that technical complexity must be mediated carefully to avoid cognitive overload (Mohan, 1986; Mehisto et al., 2008).

Several learners acknowledged the importance of the teacher's familiarity with aviation topics. Participant 3 commented that "our teacher had aviation knowledge, which made explanations clearer," indicating that subject expertise enhanced the credibility and effectiveness of instruction. Additionally, collaborative tasks and peer explanations were perceived as helpful, as noted by Participant 8: "Group tasks were helpful, especially when others explained things I didn't get." This peer-based scaffolding complements teacher-led instruction and supports the CLIL principle of active learner participation. Finally, suggestions such as adding an introductory lesson on aviation basics (P6) point to the value of conducting a prior needs analysis and sequencing instruction according to learners' domain readiness.

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The aim of collecting qualitative data through semi-structured interviews was to deepen the understanding of students' perceptions and experiences in order to reinforce and contextualise the questionnaire findings. This approach was intended to provide richer insights into how the CLIL methodology supports the development of Aviation English listening skills, particularly in terms of learner motivation, perceived authenticity of learning, and the need for instructional scaffolding. By exploring these dimensions, the study sought to demonstrate the overall effectiveness of the CLIL approach in enhancing both language proficiency and subject-matter comprehension in a professional aviation context.

Discussion

The purpose of this study was to explore the effectiveness of the CLIL approach in developing Aviation English listening skills among university students. Grounded in both quantitative and qualitative data, the research aimed to assess students' perceptions, learning outcomes, and the pedagogical implications of CLIL in a highly specialised English for Specific Purposes (ESP) context. The findings, derived from questionnaires and semi-structured interviews, confirm that CLIL has the potential to enrich language instruction by making it more relevant, engaging, and professionally meaningful. Nevertheless, the study also uncovered challenges related to content complexity and cognitive load that necessitate careful pedagogical design.

This discussion synthesises the findings with current literature, drawing upon key theoretical frameworks in CLIL and ESP. It explores the primary themes that emerged from student motivation, authenticity of learning, scaffolding needs, vocabulary acquisition, and cognitive overload, while also addressing the limitations and practical implications of the research.

One of the most prominent findings of this study is the generally positive perception of CLIL-based instruction among students learning Aviation English listening skills. Both questionnaire results and interview data revealed that learners found CLIL lessons more engaging and meaningful than traditional language classes. This enhanced motivation is a hallmark benefit of CLIL methodology, frequently cited in existing research (Coyle, et.al. 2010);

Participants repeatedly emphasised that the integration of real-world aviation scenarios and terminology helped them connect classroom activities with their professional aspirations. As one student put it, “It felt like we were preparing for real situations, not just exams.” This sentiment reflects what Dörnyei (2005) identifies as instrumental motivation - when learners perceive language skills as crucial for achieving future goals.

In the context of ESP, motivation plays an especially critical role due to the highly targeted nature of language instruction. Ruiz-Garrido and

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Fortanet-Gómez (2009) highlight that when learners see a direct application of the language to their field of study, their engagement and perseverance increase substantially. The findings of the current study support this claim, demonstrating that motivation was sustained by the professional relevance of the content.

Moreover, the alignment of content and language learning supports the cognitive engagement hypothesis proposed by Coyle et al. (2010), which suggests that learners are more likely to internalise language structures when they are cognitively engaged with the subject matter. In this study, the aviation-related materials - such as ICAO-standard dialogues, ATC-pilot exchanges, and real-time scenarios - provided that cognitive challenge, making language acquisition more purposeful and contextualised.

Additionally, the motivation derived from CLIL was not solely instrumental. Elements of intrinsic motivation were also observed. Some students mentioned that they enjoyed the challenge of combining technical content with language tasks, echoing what Ushioda (2011) refers to as self-determined motivation, learning driven by interest, curiosity, and the satisfaction of mastering complex content.

This finding has strong implications for curriculum design. To sustain student motivation in CLIL-based ESP courses, it is crucial to select content that resonates with students' career goals while also providing intellectual stimulation. Authentic materials, including real-life radio communications, NOTAMs, and pilot briefings, can serve as powerful motivators when integrated thoughtfully into the syllabus.

Authenticity emerged as another major theme from both the quantitative and qualitative data. Students perceived the learning experience as more relevant and realistic compared to general English instruction. This perception was driven largely by the inclusion of domain-specific materials, such as transcriptions of ATC-pilot conversations, flight safety announcements, and emergency protocols. Authenticity in ESP contexts is essential, as it bridges the gap between language learning and actual workplace communication (Hyland, 2006; Basturkmen, 2010). The interview data revealed that many students appreciated the use of materials that mirrored real-world aviation contexts.

One participant noted, “The recordings and tasks felt real. I could imagine myself in the cockpit or at the tower.” Such comments indicate that CLIL fosters a sense of situational realism that enhances learning outcomes by providing meaningful contexts for language use. This finding is consistent with the theoretical underpinnings of CLIL. According to Coyle et al. (2010), authenticity enhances both content comprehension and language proficiency, as learners are exposed to how language functions within a specific professional domain. This dual exposure is particularly effective in listening

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instruction, where comprehension often relies on recognising discourse patterns, jargon, and speech rhythms unique to a specific context (Field, 2008).

Conclusion

The study set out to examine the effectiveness of a CLIL approach in teaching Aviation English listening skills to university students. Drawing on both quantitative (questionnaire) and qualitative (semi-structured interview) data, the findings provide compelling evidence that CLIL can significantly enhance the learning experience in English for Specific Purposes (ESP), particularly within the aviation domain. Students reported increased motivation, a greater sense of authenticity, and more meaningful engagement when aviation-related content was integrated into language lessons. These positive perceptions are consistent with the broader literature on CLIL, which argues that contextualised and profession-oriented learning leads to deeper cognitive involvement, better vocabulary retention, and increased communicative confidence (Coyle et al., 2010; Mehisto et al., 2008). In the case of Aviation English, this authenticity is not merely pedagogical; it is a professional imperative. The use of real-world communication scenarios, ICAO-standard phraseology, and context-rich listening tasks ensures that learners are preparing not only for academic assessments but also for operational competence in high-stakes environments. However, the study also revealed challenges, particularly concerning cognitive overload. While most students appreciated the relevance of the content, some struggled with technical material that exceeded their prior knowledge or cognitive capacity. This supports existing concerns in the literature (e.g., Bruton, 2013) about the feasibility of implementing CLIL in highly technical fields without robust scaffolding. To address this, the research underscores the need for pre-task support, differentiated instruction, and collaborative teaching between language instructors and subject matter experts. These measures can help learners better manage the dual demands of acquiring both content and language knowledge simultaneously. The findings also highlight the importance of instructional design in CLIL-based Aviation English courses. Effective CLIL instruction in this context should consider:

- Gradual progression from basic to advanced aviation content;
- Use of visuals and authentic materials to support comprehension;
- Opportunities for repeated listening and post-task analysis;
- Integration of reflective and metacognitive activities to enhance retention.

Overall, the study contributes to a growing body of evidence supporting the pedagogical viability of CLIL in ESP contexts, particularly for students preparing for aviation careers. It confirms that when implemented

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thoughtfully, CLIL not only strengthens language skills but also fosters professional readiness by immersing learners in realistic communicative environments. Moreover, language teachers should receive training in aviation-related content, just as aviation trainers might benefit from insights into second language acquisition principles. Such interdisciplinary competence will become increasingly important as English continues to function as the global lingua franca in aviation.

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