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Aligning Aviation English Instruction with Pilot Communication Needs: A Comparative Study of ATPL Students in Training and Post-*Course Cadets*

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Abstract
This study undertakes a comparative needs analysis of Aviation English (AE) among Airline Transport Pilot License (ATPL) cadets. It investigates the perceptions of students at different stages of their training (1st and 3rd semesters) and those who have completed their AE course, focusing on their communicative needs and challenges. Data gathered via comprehensive surveys addresses general English proficiency, prior aviation experience, confidence across various AE communicative situations (e.g., standard phraseology, non-routine communication, technical explanations), perceived linguistic and communicative difficulties, effectiveness of pedagogical activities, and desired language support. Findings reveal a universal acknowledgement among all cadet cohorts regarding the critical importance of AE for flight safety and professional efficacy. While self-rated general English proficiency shows a progression, persistent challenges emerge in dynamic, high-stakes communication. The study highlights the perceived value of authentic, communicative learning activities. Pedagogical implications are discussed, advocating for curriculum enhancements that prioritise real-life application, targeted support for complex communicative functions, and continued skill maintenance.

Keywords: Aviation English, needs analysis, English for Specific Purposes (ESP), aviation training

Introduction

The globalised nature of aviation necessitates a common language for safe and efficient operations. Aviation English (AE), as mandated by the International Civil Aviation Organisation (ICAO), serves this crucial role, requiring both standard phraseology and proficient plain English usage, especially in non-routine situations (Alderson 2011: 386–403). For aspiring pilots undergoing Airline Transport Pilot License (ATPL) training, the acquisition of relevant AE skills is not merely regulatory compliance but an essential prerequisite for their professional careers and, more critically, for ensuring flight safety. The ability to communicate clearly and effectively, particularly under pressure or in unexpected situations, significantly reduces the risk of misinterpretation, which has historically contributed to aviation incidents and accidents (Tajima 2004: 451–470; Estival/ Molesworth 2012: 351–378).

This paper presents a comparative needs analysis designed to ascertain the specific Aviation English communication requirements and perceived challenges of ATPL cadets. Unlike much existing research that often focuses on proficiency assessment or error analysis in a single cohort, this study adopts a multi-stage comparative approach. By examining the perspectives of cadets at the commencement of their ATPL theoretical training

(1st semester), those in an intermediate phase (3rd semester), and crucially, those who have already completed their Aviation English course and are closer to actual professional practice, this research aims to provide an understanding of how AE instruction can be more precisely aligned with the evolving linguistic and communicative demands encountered by pilots throughout their career. The insights derived are intended to inform curriculum design and pedagogical practices within Aviation English programs, fostering a more responsive and effective language training framework.

1. Literature Review

The linguistic landscape of aviation has undergone significant scrutiny since ICAO introduced the English Language Proficiency Requirements (ELPRs) in 2008 (ICAO 2008). These requirements stipulate that all pilots and air traffic controllers operating internationally must achieve ICAO Language Proficiency Level 4 (Operational) or above in English, a mandate that arose from numerous accident investigations identifying language-related miscommunication as a contributing factor, highlighting a critical gap in international aviation safety protocols (Fowler et al. 2021).

Research in Aviation English has since diversified, exploring various facets integral to the field of English for Specific Purposes (ESP). Key areas of inquiry include the development and validation of ICAO-compliant language tests, detailed analyses of authentic aviation discourse to identify key linguistic features, the precise use of standard phraseology, and the crucial functions of plain English in real-time communication (Karimi et al. 2019: 751–766). Furthermore, investigations into common linguistic errors made by non-native English-speaking pilots and controllers, and their potential safety implications, have greatly contributed to understanding communicative vulnerabilities (Barshi/ Farris 2013: 2–3). Pedagogical research has also focused on effective teaching methodologies, materials development, and comprehensive curriculum design for AE courses (Barshi/ Farris 2013: 185–190).

Aviation English needs analysis is critical for developing effective ESP curricula (Emery 2016: 2425). It involves systematically identifying the target linguistic and communicative skills required by specific groups of learners for particular purposes (Bullock 2022: 117–121). While several needs analyses have been conducted within AE contexts (e.g. Shin/ Kim 2005), a comparative study across different stages of pilot training offers a valuable perspective on evolving needs and perceived gaps between instruction and real-world communication. This approach enables a more dynamic and responsive curriculum adjustment, ensuring that AE instruction remains relevant and useful to cadets as they progress towards their professional goals and face increasingly complex operational scenarios. By contrasting the perceptions of those just starting, those mid-course, and those post-course, this study aims to reveal shifts in perceived needs and confidence as cadets gain more aviation-specific experience and apply their learned English skills.

2. Methodology

2.1. Participants

The study involved a total of 54 ATPL cadets drawn from Rzeszow University of Technology, Rzeszow, Poland. Participants were strategically categorised into three distinct

groups, each representing a different stage of their training relative to their formal Aviation English course, allowing for a comparative analysis of their evolving linguistic needs and perceptions.

The first group consisted of 17 1st-semester ATPL cadets, who were at the very beginning of their theoretical ATPL training. These individuals typically had minimal to no prior exposure to formal Aviation English instruction within the current program, providing a baseline understanding of their initial AE awareness and self-assessed proficiency. The second group comprised 20 3rd-semester ATPL cadets, representing an intermediate phase of their theoretical ATPL training. By this stage, these cadets would have completed some initial AE modules, offering insights into their experiences with ongoing instruction. The third and final group included 17 Post-Training ATPL Cadets, who had completed their formal Aviation English course but have yet to begin their careers as commercial pilots. This group was further characterised by the recency of their course completion, with 52.9% having finished within the last 6 months and 47.1% between 6 and 12 months prior to the survey. This particular cohort was crucial for gathering retrospective insights into the practical application and long-term relevance of their AE training in more authentic aviation contexts. All participants across the three groups were native Polish speakers, which helped to minimise the confounding variable of diverse first language influences on their English acquisition and communication challenges.

2.2. Data Collection Instrument

Data was systematically collected through a comprehensive survey instrument. This instrument was carefully designed and slightly adapted for each participant group to ensure its relevance to their specific stage of training and experience. The survey incorporated a balanced mix of question types, including Likert-scale items for quantitative measurement of attitudes and perceptions, multiple-choice questions for direct selection of options, and open-ended questions to elicit rich, qualitative data, providing deeper insights into participant experiences and perspectives. Key areas meticulously covered by the survey included:

- *Demographic and background information:* This section gathered essential data such as participants' native language, their self-rated general English proficiency level, and details of any prior flight or simulator training experience they possessed.
- *Aviation English importance and safety perception:* This explored the cadets' perception of Aviation English's importance for a professional pilot's success, measured on a 1–5 Likert scale, and their belief regarding how poor English skills might affect flight safety.
- *Communicative confidence:* Participants were asked to self-assess their confidence in using English across a range of specific aviation communication situations. These situations encompassed standard phraseology, handling non-routine scenarios, communicating with foreign Air Traffic Control (ATC), explaining complex technical issues, communicating effectively under stress, and asking for clarification when needed.

- *Perceived linguistic challenges:* This section aimed to identify specific areas of Aviation English that participants found challenging. Categories included listening to fast-paced ATC speech, speaking clearly over the radio, understanding standard phraseology, effective communication in non-routine or emergency situations, pronunciation and clarity, general aviation vocabulary, reading METARs/TAFS, writing safety or incident reports, and understanding plain English in various contexts.
- *Effectiveness of learning activities:* Participants rated the perceived effectiveness of different pedagogical activities typically encountered within AE courses. These activities included listening to live or recorded ATC conversations, engaging in role-plays and simulations (specifically pilot-controller dialogues), watching aviation-related videos with transcripts, participating in group discussions or scenario-based tasks, traditional grammar and vocabulary exercises, working with real aviation documents (e.g., checklists, NOTAMs), and accent familiarisation exercises.
- *Desired language support:* This section explored participants' preferences for various types of additional language support they believed would enhance their AE proficiency. Options included a desire for more listening practice with real-world ATC audio, additional speaking drills and phraseology repetition, explicit instruction on using plain English for non-standard situations, simulator-based language tasks, ICAO test preparation strategies, confidence-building activities for speaking, and focused grammar or vocabulary review.
- *Course evaluation and realism:* This part assessed their agreement with statements concerning the course's reflection of real-life communication, the perceived pace of their language progression within the AE course, and the relevance of course materials to their future career.
- *Post-course application and maintenance (for post-training cadets):* This section delved into the experiences of cadets who had completed their AE course. It queried the frequency of their English use in actual flight or simulator environments, the types of communicative situations they encountered, their retrospective perception of the realism of classroom activities compared to actual communication, and the methods they employed for self-maintenance and continued development of their Aviation English skills.
- *Open-ended questions:* Throughout the survey, opportunities were provided for participants to offer additional comments, elaborate on specific examples of difficult English usage scenarios they had encountered, or propose further suggestions for improving AE instruction.

2.3. Current AE course methodology (contextual background)

The Aviation English course, which forms the basis of the participants' formal training, is primarily conducted in a dedicated language lab environment. This pedagogical setting is designed to facilitate intensive and interactive language practice through the extensive use of headsets, enabling both individual and paired activities. The curriculum places a significant emphasis on developing two core linguistic skills critical for aviation, that is speaking practice and listening comprehension.

Speaking practice involves structured role-plays, simulated pilot-controller dialogues, and various communicative tasks designed to encourage spontaneous and accurate spoken English in aviation-specific scenarios.

Listening comprehension focuses on intensive work with authentic and simulated Air Traffic Control recordings, purposefully exposing learners to a range of accents and training them to comprehend speech at varying speeds, including the rapid pace often encountered in live ATC communication. The content throughout the course is meticulously integrated with real-world aviation-specific contexts, practical scenarios, and specialised vocabulary. This holistic approach aims to ensure that cadets are not only linguistically proficient but also communicatively competent and confident in the demanding environment of their future profession.

2.4. Data Analysis

Quantitative data derived from the Likert scales and multiple-choice questions were systematically aggregated and subjected to descriptive statistical analysis. Percentages and frequencies were calculated to identify prevailing trends within each group and to facilitate direct comparisons across the three distinct cadet cohorts. This allowed for the identification of commonalities, divergences, and developmental patterns in their perceptions and needs. Qualitative data, obtained from the open-ended questions, underwent a rigorous content analysis. This involved identifying recurring themes, extracting specific illustrative examples, and uncovering nuanced perceptions that added depth and contextual understanding to the quantitative findings. This mixed-methods approach provided a comprehensive overview of the Aviation English needs analysis.

3. Results

3.1. General English Proficiency and Native Language Background

All surveyed cadets, without exception, identified their native language as Polish, establishing a linguistically homogeneous participant group. An observable and progressive trend in self-rated general English proficiency was noted across the three cohorts, suggesting a positive impact of their cumulative educational and training experiences. Among the 1st-semester cadets, 52.9% rated their proficiency as Advanced, with 41.2% categorising themselves as Intermediate. For the 3rd-semester cadets, the distribution shifted slightly, with 60% reporting Intermediate proficiency and 35% Advanced. Notably, the Post-Training Cadets demonstrated a higher overall self-perceived proficiency, with 64.7% rating themselves as Advanced and 23.5% as Intermediate. This upward trend in self-assessed proficiency indicates that the combined effect of their general studies and specialised AE training contributes positively to their confidence in their English language abilities.

3.2. Prior Aviation Experience and English Usage in Aviation Settings

All study participants were PPL holders, however, other than that, prior flight or simulator training experience was found to be notably limited among the in-training cadets. Specifically, 95% of 3rd-semester cadets and 94.1% of 1st-semester cadets reported having no prior flight or simulator experience before commencing their ATPL program other than

PPL training. Correspondingly, 85% of 3rd-semester cadets and 76.5% of 1st-semester cadets indicated that they had not yet used English in a real aviation setting. Those few who had used English cited instances primarily in simulator environments, during PPL training communications, or very limited direct ATC interactions.

In stark contrast, all (100%) of the Post-Training Cadets reported having had opportunities to use English in actual flight or simulator environments since completing their formal AE course. The communicative situations they described were diverse, encompassing routine in-flight communication, standard Air Traffic Control (ATC) and Flight Information Services (FIS) interactions, and crucially, non-routine scenarios. Examples provided included communicating about unusual engine oil pressure or the presence of animals in the vicinity of the runway, demonstrating the practical application of their AE skills in dynamic, unpredictable contexts beyond standard phraseology.

3.3. Perceived Importance of Aviation English and Impact on Flight Safety

An overwhelming consensus emerged across all three cadet groups regarding the critical importance of Aviation English and its direct impact on flight safety. A resounding 100% of all surveyed cadets unequivocally believed that poor English skills could detrimentally affect flight safety. Furthermore, when asked about the importance of AE for a professional pilot's overall success, it was rated as 'extremely important' (score 5 on a 5-point scale) by 94.1% of 1st-semester cadets, 75% of 3rd-semester cadets, and 70.6% of post-training cadets. The remaining percentages for each group primarily rated it as 'very important' (score 4). This near-unanimous agreement, irrespective of their stage in training, underscores the cadets' acute awareness and profound understanding of AE's non-negotiable role in ensuring safe and effective air operations.

3.4. Confidence in Using English in Aviation Situations

Self-assessed confidence levels in using English varied significantly depending on the specific aviation communicative situation. Confidence was consistently highest across all groups when it came to using standard phraseology, with post-training cadets showing the highest proportion of 'Extremely confident' responses in this area. This suggests that the foundational training effectively instils competence in standardised communication.

However, a noticeable decrease in confidence was observed for more complex and dynamic communicative functions. Cadets generally reported lower confidence levels when faced with handling non-routine situations, explaining technical issues, communicating under stress, and communicating with foreign Air Traffic Control (ATC). In these areas, responses frequently fell into the 'Moderately confident' or 'Slightly confident' categories. While post-training cadets generally exhibited higher overall confidence across all scenarios compared to their in-training counterparts, these dynamic and high-stakes situations still represented areas of considerable self-perceived challenge. Confidence in asking for clarification was generally higher than for technical or stressful situations, yet still presented room for improvement, particularly among the in-training cohorts. This data indicates that while the AE course contributes positively to overall communicative confidence, especially in established procedures, the more nuanced, improvisational, and cognitively demanding aspects of aviation communication remain areas requiring further development and targeted practice.

3.5. Perceived Challenging Areas of Aviation English

Consistent challenges were identified across all cadet groups, albeit with varying degrees of intensity, highlighting the recurrent difficulties in specific areas of Aviation English. These frequently cited challenges included:

- *Listening to fast-paced ATC speech:* This was a pervasive challenge, underscoring the rapid and often dense nature of real-time air traffic control transmissions.
- *Communicating in non-routine/emergency situations:* This difficulty aligns with the lower confidence levels observed in handling unexpected scenarios, emphasising the need for flexible and adaptive plain English usage.
- *Speaking clearly over the radio:* This challenge was more pronounced among in-training cadets, suggesting that practice within the AE course helps to mitigate this.

Interestingly, post-training cadets found 'Understanding standard phraseology' and 'Reading METARs/TAFS' to be significantly less challenging compared to their in-training counterparts. This suggests that the formal AE training effectively addresses and solidifies foundational knowledge in these highly structured linguistic domains. However, the consistent identification of challenges related to the high-pressure, unpredictable nature of real-time, non-routine communication underscores a persistent gap that requires continued attention beyond initial course completion.

3.6. Effectiveness of Learning Activities and Desired Language Support

When asked to rate the effectiveness of various learning activities, cadets overwhelmingly favoured methods that closely simulated real-world aviation communication. Activities consistently rated as 'Very effective' or 'Extremely effective' across all groups included:

- *Listening to live or recorded ATC conversations:* Post-training cadets, in particular, rated authentic ATC listening as 'Extremely effective', highlighting its perceived direct relevance.
- *Role-plays and simulations:* Specifically, pilot-controller dialogues were highly valued for their practical application.
- *Watching aviation videos with transcripts:* This multimodal approach was seen as very beneficial for both listening comprehension and contextual understanding.
- *Working with real aviation documents:* Engaging with materials such as checklists and NOTAMs provided practical linguistic exposure within authentic contexts. In contrast, more traditional pedagogical approaches, such as isolated grammar and vocabulary exercises, were generally rated as only 'Moderately effective' by a significant number of participants, suggesting that while they may have a place, their impact is less pronounced compared to more immersive activities.

Reflecting their identified challenges and positive experiences with effective learning activities, cadets expressed a strong desire for specific types of additional language support. The most highly desired forms of support included:

- More extensive listening practice with authentic, real-world ATC audio.
- Increased speaking drills and focused phraseology repetition.

- Dedicated instruction and practice in using plain English for non-standard situations.
- The integration of simulator-based language tasks to bridge classroom learning with high-fidelity operational environments.
- Activities specifically designed to build confidence in speaking aviation English.
- More comprehensive ICAO test preparation strategies, particularly for post-training cadets who are closer to the formal assessment. These preferences clearly indicate a demand for more authentic, practical, and confidence-building communicative experiences.

3.7. Course and Teaching Process Evaluation (Cadets in Training)

For both the 1st- and 3rd-semester cadets who were actively undergoing the Aviation English course, the evaluation of the course and teaching process was largely positive. A significant majority agreed or strongly agreed with several key statements:

- The course effectively reflects real-life aviation communication scenarios.
- They perceived their progression in Aviation English to be faster than their progress in general English classes.
- The materials used within the course were highly relevant to their future professional careers as pilots. These agreements suggest a strong foundational approval of the curriculum and pedagogical approach by those directly experiencing it.

3.8. Post-Course Cadets: Course Realism and Self-Development

Insights from the post-training cadets provided a retrospective evaluation of their AE course and highlighted their engagement in skill maintenance.

- *Classroom realism:* When reflecting on the realism of classroom activities compared to actual aviation communication situations, 76.5% of post-training cadets found them 'somewhat realistic', while 11.8% found them 'very realistic'. This indicates a good, but not absolute, alignment between the simulated environment and real-world demands, suggesting room for enhanced authenticity.
- *Positive impact:* A compelling qualitative insight from one post-training cadet powerfully articulated the perceived value of the course: "I believe it was the most important factor which allowed me to get ICAO level 6 proficiency". This highlights the significant impact formal AE training can have on achieving high-level language proficiency.
- *Skill maintenance:* A considerable proportion of post-training cadets reported actively maintaining or improving their AE skills, with 70.6% doing so occasionally and 17.6% regularly.
- *Self-study resources:* Their methods for self-development primarily involved utilising readily available authentic aviation materials. The most frequently used resources included: reading METARs/TAFS (94.1%), watching aviation-related videos (82.4%), engaging with ATC YouTube channels (76.5%), and listening to live ATC transmissions via LiveATC.net (70.6%). This reliance on authentic, self-selected resources underscores their proactive approach to continuous learning but also implicitly suggests a need for more structured, institutionally-sup-

ported post-course guidance. One cadet also provided a practical suggestion, noting that "Headsets in class could be more reliable", indicating that optimising technical infrastructure can further enhance the effectiveness of listening and speaking practice.

4. Discussion

The findings from this comparative needs analysis of Aviation English instruction underscore several key implications for pedagogical design and implementation. Firstly, it is recognised among ATPL cadet cohorts that AE is significant for flight safety and professional efficacy. This acknowledgement reflects a level of intrinsic motivation among learners, which is crucial for effective language acquisition and skill development in AE programs (Moskalenko/ Muravska/ Didenko et al. 2019: 200–221). Motivation enhances engagement in learning and positions AE as a foundational element in flight training and operational competence.

Secondly, while cadets show improvement in self-rated general English proficiency throughout their training, a gap persists between their general language capabilities and the specialised, dynamic communicative demands in aviation contexts. Cadets often express decreased confidence while engaging in non-routine situations, where the ability to adapt and use plain English accurately is vital. This gap suggests instructional improvements are desired, particularly in developing higher-order communicative functions that address the cognitive load associated with real-time communication under pressure (Borowska 2017). Focusing on these functions can lead to enhanced preparedness for the unpredictable scenarios encountered in professional aviation.

Moreover, the expressed preference by cadets for authentic, scenario-based, and interactive learning modalities reinforces the principles of English for Specific Purposes pedagogy. Cadets find methods such as live ATC recordings and high-fidelity simulations particularly effective, as they replicate the complex communication situations expected in their careers. The feedback regarding the somewhat realistic nature of classroom activities highlights the need for a greater integration of real-world complexities within the curriculum. This adaptability in teaching practices is essential as students transition from theoretical knowledge to practical application (Bullock 2016: 35–45).

The analysis further suggests that AE proficiency should be viewed as a continuous developmental process rather than a finite achievement at course completion. Post-training cadets actively engage in self-directed learning and utilise authentic aviation materials to advance their skills. This indicates a critical area for training organisations, which should provide structured support for ongoing skill enhancement, especially concerning navigation through unpredictable communicative scenarios (Weggler 2016: 51–60). Training regimes that include peer learning networks and accessible resource provisions, such as e-learning platforms, could facilitate the ongoing improvement of AE proficiency in practical contexts (Łączek/ Szerszeń 2016: 79–90).

From a linguistic standpoint, identified challenges such as processing fast-paced ATC communication and articulating technical explanations demand targeted instructional strategies aimed at developing specific discourse competences. Such competence encompasses advanced listening strategies, grammatical flexibility, and pragmatic skills necessary for effective communication in unpredictable situations. Successful teaching must

blend linguistic accuracy with the practical application of communication skills through rich, immersive learning environments that mirror operational realities.

5. Conclusions

This comparative study unequivocally demonstrates that ATPL cadets possess a profound understanding of Aviation English's vital role in flight safety and professional success. While initial AE instruction effectively builds foundational skills, particularly in standard phraseology and general proficiency, persistent challenges remain in dynamic, high-stakes communication situations. Cadets overwhelmingly favour practical, scenario-based learning activities that closely emulate real-world aviation communication, highlighting their perceived effectiveness in preparing them for professional demands. Furthermore, the study underscores that AE proficiency is an ongoing developmental journey, requiring continuous skill maintenance beyond formal course completion.

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