

Content Analysis of Aviation English for Aircraft Maintenance Technology Students: Basis for Curriculum Enhancement

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DOI: <https://doi.org/10.5281/zenodo.10567040>

Published Date: 25-January-2024

Abstract: English language skills in aviation play an important role in ensuring effective communication, safety, and operational efficiency within the global air transportation system. Aviation English, as a distinct branch of the language, is tailored to the specific needs of aviation. This specialized form of communication is essential in diverse settings, including aircraft maintenance operations. The sufficient application of English language skills is important among AMT students and tailoring the course to align with their distinct needs is more efficient than a one-size-fits-all approach. This study explores a comprehensive analysis of the English course within the Aircraft Maintenance (AMT) Program, focusing on identifying gaps in the existing course and propose specific measures for improvement. A mixed-methods approach integrating both quantitative and qualitative methodologies were used to provide a holistic understanding of the English course content in the AMT program. The results revealed that the current English course (Purposeful Communication) had some gaps that needs to be addressed. Specifically, it lacked a strong focus of the four language skills and vocabulary development, essential for effective communication in aviation. The content topics and learning outcomes do not align with the language proficiency skills assessed in ICAO standards. Further, the study found that the program could be enhance by incorporating a tailored English course for AMT students that align with the English language skills that are perceived to be important by individuals working in the field of aircraft maintenance. These will enhance the English competencies of students, ensuring they are well-equipped to excel in the aviation industry.

Keywords: Aviation English, Communication, Competence, Content Analysis, Curriculum Enhancement, English Language Skills, Proficiency.

I. INTRODUCTION

English is regarded as the most spoken language in the world. People use English worldwide to suit their purposes making it generally recognized as a necessary medium in the global context. As societies become increasingly interconnected in modern times, the importance of the English language has grown significantly, transcending geographical and cultural boundaries. A good understanding of the English language is essential as it ensures that the communication is complete and correctly understood by the intended people.

This study focuses on the critical role of English language proficiency in aviation, particularly in aircraft maintenance. It highlights the global significance of English and its vital role in ensuring effective communication and coordination within the aviation industry. The study emphasizes the need for tailored English training programs in aviation institutions to address the specific needs of learners, particularly in the field of aircraft maintenance.

(Niamsuwan, 2017) underscores the impact of English proficiency on job performance among aircraft mechanics, emphasizing the language's prevalence in communication and documentation within the aircraft maintenance field. The study aims to identify the essential English language skills required for Aircraft Maintenance Technology (AMT) students. It employs a mixed-methods approach, using quantitative surveys with aircraft technicians and qualitative content analysis of the current English courses at PhilSCA to inform curriculum enhancements.

The quantitative method involves a survey questionnaire administered to aircraft mechanics to identify workplace-relevant English language skills. The qualitative component comprises a detailed content analysis of the English course materials at PhilSCA. These methods aim to provide a comprehensive understanding of the subject and inform improvements in the aviation English curriculum for AMT students, ultimately contributing to their competence in the industry.

II. BODY OF ARTICLE

Recognizing the diverse needs of learners, the call for tailoring courses becomes imperative. A one-size-fits-all approach falls short, necessitating a curriculum that closely simulates communicative needs, achieving required competencies and operational proficiency. A thorough evaluation of aviation English, considering vocabulary usage, application contexts, and purposive aspects, becomes essential.

The Philippine State College of Aeronautics (PhilSCA) integrates Aviation English into its curriculum, primarily for selected aviation programs, omitting Aircraft Maintenance Technology (AMT). The current English course pursued by AMT students, Purposive Communication, though essential for academic and career success, lacks the advanced knowledge and skills specific to the aircraft maintenance industry. The transformation of the English course for the AMT Program at PhilSCA is proposed to align with the aviation industry's specific requirements. This adjustment aims to tailor the curriculum into an English for Specific Purposes (ESP) course, honing communication skills indispensable for students specializing in aircraft maintenance. This comprehensive summary highlights the importance of adapting language education to the nuanced demands of aviation professions, ensuring effective communication and operational excellence.

Statement of the Problem

The main objective of the study is to establish the importance of the Aviation English course for AMT students and enhance the current curriculum through document analysis. The study seeks to provide answers to the following questions:

1. What is the demographic profile of the participants in terms of: age, education, employment status, rank/position and length of service?
2. What is the required competence level of English proficiency for aircraft mechanics concerning the essential language skills in English?
3. How may the Purposive Communication subject currently being pursued by AMT students be described?
4. What are the salient features of Aviation English course that effectively contributes to enhancing English skill proficiency and overall aeronautical competence development?
5. Based on the findings, what improved competencies may be proposed to enhance the English curriculum of AMT students?

Methodology

The study employs a mixed-methods approach, seamlessly integrating quantitative and qualitative methodologies. A survey questionnaire gathers data from 72 aircraft maintenance professionals, with 32 from Dornier Technology Inc. and 40 from an undisclosed airline. Statistical methods are applied to analyze the significance of specific English language skills in the workplace. Concurrently, qualitative content analysis assesses the current English course at the Philippine State College of Aeronautics (PhilSCA), serving as the foundation for curriculum enhancement.

The participants, representing a diverse group of 72 individuals in aircraft maintenance, offer valuable insights. Predominantly holding Mechanic C positions, the majority falls within the 26-30 age range, possessing a Bachelor's degree. Survey outcomes underscore a high expectation of competence across all English language skills, particularly emphasizing the importance of reading and listening. The content analysis indicates a well-structured Purposive Communication course but hints at a potential misalignment with the specific needs of AMT students. This synthesis of methods and participant insights provides a comprehensive understanding of the research landscape.

III. SUMMARY OF FINDINGS

Based on the data collected, analyzed, and interpreted from the Survey Questionnaire and Content Analysis, the following are the significant findings of the study:

1. The study involved 72 participants who are currently working in the field of aircraft maintenance. Majority of the participants were between the age range of 26-30 years old (43%), with the rest being either 21-25 years old (31%) or 31 and above (26%). In terms of educational attainment, the majority of participants had completed their Bachelor's degree (97%), while few had obtained their Master's degree (3%). The participants from Dornier Technology Inc (32) and from an undisclosed airline (40) had diverse ranks and positions in the field of aircraft maintenance, with the majority holding the position of Mechanic C (46%), followed by Mechanic A (17%), Mechanic B (10%), Team leader (7%), and others (21%). In terms of work experience, the majority of participants had been working in the field for more than 3 years (50%), followed by less than 1 year (33%), while some had been working for 1-2 years (13%) and the remaining had been working for 2-3 years (4%). These suggest that these groups are experienced in the field and could provide valuable insights on the curriculum enhancement of the AMT Program.

Table 1: FREQUENCY AND PERCENTAGE DISTRIBUTION OF PARTICIPANTS' DEMOGRAPHIC PROFILE

Particulars	Category	Frequency f	Percentage %
Age	21-25	22	31
	26-30	31	43
	31 and above	19	26
Education	Bachelor's Degree	70	97
	Master's Degree	2	3
	Doctorate	0	0
Rank/Position	Mechanic A	12	17
	Mechanic B	7	10
	Mechanic C	33	46
	Team Leader	5	7
	Others	15	21
Length of Service	less than 1 year	24	33
	1 - 2 years	9	13
	2 - 3 years	3	4
	Above 3 years	36	50

2. The participants' perception on the level of importance of the aircraft mechanics was rated as very important. Among the four English language skills assessed, reading scored the highest with a mean score of 3.92, closely followed by listening at 3.89. Speaking received a score of 3.81, and writing was rated at 3.76.

Table 2: DESCRIPTIVE STATISTICS FOR THE IMPORTANCE OF ENGLISH SKILLS, INCLUDING MEAN VALUES PER SAMPLE

Descriptive Statistics	Speaking	Writing	Listening	Reading
Count	72	72	72	72
Mean	3.81	3.76	3.89	3.92
StDev	0.432448	0.517117	0.358225	0.325014
Range	2	2	2	2
Minimum	2	2	2	2
25th Percentile (Q1)	4	4	4	4
50th Percentile (Median)	4	4	4	4
75th Percentile (Q3)	4	4	4	4
Maximum	4	4	4	4
95.0% CI Mean	3.7039 to 3.9072	3.6424 to 3.8854	3.8047 to 3.9731	3.8403 to 3.993
95.0% CI Sigma	0.37154 to 0.51744	0.44428 to 0.61874	0.30777 to 0.42863	0.27923 to 0.38889
Anderson-Darling Normality Test	18.578	17.108	22.599	24.082
P-Value (A-D Test)	0.0000	0.0000	0.0000	0.0000
Skewness	-2.100	-2.159	-3.424	-4.255
P-Value (Skewness)	0.0000	0.0000	0.0000	0.0000
Kurtosis	3.778	3.935	12.213	19.289
P-Value (Kurtosis)	0.0007	0.0006	0.0000	0.0000

As for the required competence level of English proficiency for aircraft mechanics concerning the essential language skills in English, the results consistently reflect a high expectation of competence across all four language skills. The speaking skill stands out as the most proficient skill. It is followed closely by listening, indicating strong comprehension and interpretation abilities when receiving and understanding spoken information. Speaking skills also rank highly, showcasing their capability to communicate effectively in English, particularly in tasks involving discussions, presentations, and interactions. Writing skills, while still very competent, have the lowest mean score among the four skills.

Table 3: ANALYSIS OF VARIANCE FOR WRITING SKILL

One-Way ANOVA & Means Matrix: Y

H₀: Mean 1 = Mean 2 = ... = Mean k

H_a: At least one pair Mean i ≠ Mean j

Writing Task	Count	Mean	Standard Deviation	UC (2-sided, 95.0%, pooled)	LC (2-sided, 95.0%, pooled)	Verbal Interpretation
1. Writing aircraft maintenance reports and documentation related to maintenance activities	72	3.736	0.474507	3.868	3.604	Very Competent
2. Composing emails and written correspondence with international clients or suppliers	72	3.472	0.649425	3.604	3.34	Very Competent
3. Preparing maintenance logs and records	72	3.556	0.578704	3.688	3.423	Very Competent
4. Drafting safety manuals, guidelines, and protocols in English	72	3.653	0.534967	3.785	3.521	Very Competent

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 Vol. 11, Issue 1, pp: (27-35), Month: January - February 2024, Available at: www.noveltyjournals.com

5. Documenting incident reports and documentation for regulatory compliance.	72	3.597	0.573099	3.729	3.465	Very Competent
6. Developing written procedures and checklists for maintenance tasks.	72	3.583	0.550288	3.715	3.451	Very Competent
7. Preparing serviceable tags.	72	3.625	0.542231	3.757	3.493	Very Competent
8. Preparing written responses to inquiries from regulatory authorities.	72	3.542	0.648671	3.674	3.41	Very Competent
9. Drafting official communications for internal announcements or memos	72	3.639	0.564328	3.771	3.507	Very Competent
10. Preparing written presentations for meetings or briefings	72	3.597	0.573099	3.729	3.465	Very Competent

3. The findings from the content analysis of the Purposive Communication course syllabus reveal a comprehensive program with a total of 79 learning objectives, focusing predominantly on general communication and writing. The course encompasses a well-rounded education in various aspects of communication, with a strong emphasis on English for General Purposes, Global Communication, Writing, and General Communication. The current Purposive Communication course, while valuable, may not fully align with their career requirements. Therefore, there is a pressing need to ensure that the English curriculum for Aircraft Maintenance Technology students is tailored to meet their industry-specific language and communication needs, which are not entirely addressed by the general communication focus of the Purposive Communication course. This alignment is crucial for preparing students with the skills necessary for success in their aviation maintenance careers.

Table 4: FREQUENCY DISTRIBUTION OF THE PURPOSIVE COMMUNICATION COURSE, DESCRIBING ITS LEARNING OBJECTIVES ACROSS DIFFERENT STAGES

Learning Objectives	Focus	Frequency
Course Learning Outcomes	General Communication	11
	Global Communication	1
	Cultural Communication	1
	Business Communication	2
	Writing	4
	Speaking	2
Learning Outcomes for the Preliminary Period	General Communication	9
	Communication Models/Processes	4
	Communication Ethics	2
	Digital Communication	3
	Global Communication	1
	Cultural Sensitivity	2
Learning Outcomes for the Midterm Period	General Communication	4
	Business Communication	8
	Technical Communication	1
	Speaking	4
	Writing	4
Learning Outcomes for the Final Period	General Communication	5
	Academic Writing	5
	Reading	1
	Writing	4
	Speaking	1

4. The Aviation English course focuses on enhancing language skills and overall competence in the aviation industry. It emphasizes a strong focus on speaking, listening, and vocabulary development, essential for effective communication in aviation. The course's content topics align with ICAO standards, prioritizing speaking and listening skills and demonstrating a commitment to preparing students for language proficiency assessments. Effective communication is paramount for Aircraft Maintenance professionals who bear the responsibility of ensuring aircraft safety and airworthiness. The course's strong focus on speaking, listening, and vocabulary development equips these students with the language skills necessary for precise communication in their roles. Furthermore, the course's diverse assessment methods and content topics, covering specialized aviation subjects, prepare students for real-world communication within their field. This enhances their ability to work efficiently, uphold safety standards, and contribute to the overall success and safety of aviation operations.

Table 5: FREQUENCY AND PERCENTAGE DISTRIBUTION OF ALL THE LEARNING OBJECTIVES IN THE AVIATION ENGLISH COURSE

Learning Objectives	Category	Focus	Frequency	Percentage
Learning Outcomes	English Specific Purposes	for Writing	2	8
		Speaking	15	63
		Listening	4	17
		Vocabulary	3	13

Table 6: FREQUENCY AND PERCENTAGE DISTRIBUTION OF THE CONTENT TOPICS COVERED IN THE AVIATION ENGLISH COURSE SYLLABUS GROUPED ACCORDING TO THEIR RESPECTIVE FOCUS

Content Topics	Primary Focus	Frequency	Percentage
Content Topics of Aviation English	Writing	1	2
	Speaking	16	30
	Reading	0	0
	Listening	6	11
	Pronunciation	6	11
	Structure	3	6
	Vocabulary	9	17
	Fluency	1	2
	Comprehension	6	11
	Interaction	6	11

5. The findings of the study highlight a significant need to enhance the English curriculum for AMT students, aligning it more closely with the demands of the aviation industry. The current Purposive Communication course, falls short of meeting industry standards, particularly those established by organizations like the International Civil Aviation Organization (ICAO). To address this gap and better prepare students for success in aviation maintenance, it is essential to implement a tailored approach to language proficiency. This entails the introduction of specialized English courses, such as Aviation English. Such courses are designed to provide students with precise language skills, including industry-specific vocabulary, phrases, and communication abilities, crucial for effective communication within aviation maintenance. By incorporating these tailored courses, the AMT program can significantly enhance the English competencies of its students, ensuring they are well-equipped to excel in the aviation industry.

IV. CONCLUSIONS & RECOMMENDATIONS

Conclusions

1. The majority of study participants hold the position of Mechanic C and have accumulated more than three years of experience in the field. Majority fall within the age range of 26 to 30 and have completed their bachelor's degrees.
2. The participants perceived the importance of English language skills, with reading and listening skills rated as the highest, closely followed by speaking and writing. As for the required competence level, the findings consistently reveal a high expected level of competence in all four language skills, with reading and listening skills standing out as particularly proficient, emphasizing their strong communication and comprehension abilities, then closely followed by speaking. Moreover, writing skills, while still expected to demonstrate similar level of competence, exhibit a slightly lower mean score., exhibit a slightly lower mean score. These results emphasize the crucial role of English language proficiency for aircraft mechanics and highlight areas for potential curriculum improvement to ensure a well-rounded skill set that aligns with the industry's demands.
3. The analysis of the Purposive Communication course reveals a well-structured program that emphasizes foundational communication skills, providing a comprehensive education in various aspects of communication. However, it is essential to acknowledge a potential gap in addressing the specific English language proficiency needs of AMT students. These students require a specialized English course that focuses on technical and aviation-related terminology and communication skills relevant to their field.
4. The Aviation English course offers a comprehensive approach to developing specific language skills tailored to the aviation industry not only benefits pilots and air traffic controllers but also holds great value for Aircraft Maintenance students. The Aviation English course proves to be an invaluable qualification for Aircraft Maintenance students, empowering them with the linguistic competence needed for their crucial roles in the aviation industry.
5. Incorporate Aviation English course in the curriculum as a separate course to equip students with additional knowledge and skills relevant to the aviation industry. This course can be designed to incorporate real-world practices and immersive opportunities, ensuring that it aligns effectively with the students' perception of the critical importance of various language skills, thus equipping them with the practical language proficiency required for success in their field.

Recommendations

Based on the findings and conclusions of the study, the following recommendations are offered:

The main objective of the study is to establish the importance of Aviation English course for AMT students and enhance the current curriculum through document analysis. Specifically, the study seeks to provide answers to the following questions:

1. Future researcher should broaden the scope of the study by incorporating participants from diverse aviation companies, including various airlines, MRO facilities, and aviation institutions to provide a more holistic understanding of the required competence level in English proficiency for aircraft mechanics, specifically focusing on essential language skills in English.
2. Aviation companies should integrate language training programs with regular assessments. Design a tailored English language program for aircraft maintenance professionals, emphasizing industry-specific language and communication skills. Implement regular assessments aligned with international standards (e.g., ICAO) to continuously evaluate and improve participants' English proficiency for aviation accreditation.
3. The English course for the AMT program should maintain equal emphasis on the English language skills, which have been deemed highly important to aircraft mechanics. This balanced approach will ensure that AMT students are well-equipped with comprehensive English language competencies that meet industry standards, ultimately enhancing their effectiveness and success in the aviation field.
4. The Purposive Communication course should be complemented with a specialized English course as the existing English course does not fully align with the career demands of AMT students. This tailored course should harmonize the

International Journal of Novel Research in Education and Learning

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English curriculum and prioritize technical and aviation-related terminology and communication skills, addressing the specific needs of the field. By implementing a specialized English curriculum, the program can better equip students with the industry-specific language and communication competencies necessary for their success in aviation maintenance careers.

5. AMT program should consider integrating Aviation English course into their curriculum to enhance the language proficiency of their students. This specialized course, with its emphasis on the four essential language skills - speaking, listening, reading, and writing, addresses the unique communication needs of Aircraft Maintenance professionals, ensuring precise and effective communication in their roles. Apart from the four skills, the six ICAO language proficiency skills should be added as additional features to improve the Aviation English course.

6. Philippine State College of Aeronautics should consider updating the curriculum and incorporate tailored English courses, such as Aviation English for AMT students with a strong focus on the specific language requirements on the field of maintenance. Aviation English course for AMT students should encompass a range of competencies essential for effective communication in the field of aviation maintenance. This includes mastering technical vocabulary, communicative phrases, accurate documentation skills, multicultural communication, radio proficiency, pronunciation, comprehension, effective team collaboration, and simulated scenarios to enhance practical application, fostering adaptability and continuous learning.

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