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THE POWER OF WORDS: WHY ENGLISH READING & COMPREHENSION ARE VITAL FOR AIRCRAFT MAINTENANCE AT ORAN AIRPORT

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Abstract

The ubiquity of English in every aspect of life has made it global and even mandatory in almost all domains. Its need is growing day by day, becoming as indispensable as a key ingredient in a recipe; without it, the result may be unsuccessful. The aviation sector is a prime example where English's relevance and importance can't be neglected, as it is used universally by everyone involved in ensuring safe flights. A crucial component in any flight safety is the role of aircraft mechanics, who are responsible for ensuring the proper maintenance of aircraft. Like other professionals, they have a range of responsibilities, including performing repair procedures and addressing mechanical issues, among other tasks. Their documentation is all written in English, necessitating a level of proficiency to effectively read and understand these documents. Therefore, this paper aims to assess their overall proficiency, focusing on their comprehension of such documents, identifying language difficulties, and suggesting remedial actions to improve the situation. To achieve these objectives, a case study was conducted at Oran airport with (12) mechanics, using various instruments, including an interview, a reading self-assessment checklist, and comprehension tasks. The results showed that nearly all participants face similar difficulties. They admit their struggle with specialized terminology used in manuals and technical documents, and they found it challenging to interpret technical descriptions due to their limited proficiency. Participants also reported difficulties in collaborating with international teams and in understanding training materials. To address these issues, they all together suggested implementing translation services and offering both general and specialized accelerated courses.

Keywords: English for Mechanics, documentation, aircraft maintenance, reading, comprehension.

Le Pouvoir des Mots : Pourquoi La Lecture et la Compréhension sont-elles Essentielles pour les Mécaniciens à L'aéroport d'Oran?

Résumé:

L'omniprésence de l'anglais dans tous les aspects de la vie l'a rendu universel voire obligatoire dans presque tous les domaines. Son besoin s'accroît de jour en jour, devenant aussi indispensable qu'un ingrédient clé dans une recette. Sans lui, le résultat serait voué à l'échec. Le secteur de l'aviation est un parfait exemple où la pertinence et l'importance de l'anglais ne peuvent être négligées, car il est utilisé universellement par tous ceux qui sont impliqués dans la sureté des vols.

Un élément crucial de la sécurité de tout vol est le rôle des mécaniciens, chargés d'assurer le bon entretien des aéronefs. Comme les autres professionnels, ils ont un certain nombre de responsabilités, notamment l'exécution de procédures de réparation et la résolution de problèmes mécaniques, entre autres tâches. La documentation est entièrement rédigée en anglais, ce qui nécessite une certaine compétence linguistique pour lire et comprendre efficacement ces documents.

Ceci étant, l'objectif de ce travail est d'évaluer leur niveau global de compétence avec un accent mis sur leur compréhension de ces documents, en identifiant les difficultés linguistiques et en suggérant des actions correctives pour améliorer la situation. Pour atteindre ces objectifs, une étude de cas a été menée à l'aéroport d'Oran auprès de (12) mécaniciens, en utilisant divers instruments, notamment l'entretien, la liste de contrôle d'auto-évaluation de lecture, et les tâches de compréhension.

Les résultats ont montré que presque tous les participants rencontrent des difficultés similaires. Ils admettent avoir des difficultés avec la terminologie spécialisée utilisée dans les manuels et les documents techniques. Il leur était difficile, également, d'interpréter les descriptions techniques en raison de leurs compétences limitées. Les participants ont également fait état de difficultés à collaborer avec des équipes internationales et à comprendre les supports de formation.

Pour remédier à ces problèmes, ils ont tous suggéré de mettre en place des services de traduction et de proposer des cours accélérés généraux et spécialisés.

Mots-clés: Anglais pour les mécaniciens, documentation, entretien des avions, lecture, compréhension.

Introduction

Years ago, English became the official language of aviation. However, frequent accidents caused by language-related issues highlighted the need to prioritize English proficiency, leading to the establishment of new standards and principles. Understanding aircrafts is not easily achieved, especially given that they are among the most essential means of transportation worldwide. As a result, ensuring their safety is paramount to safeguarding human life. As evidence, Algerian mechanics must work with technical documentation that is entirely in English.

All aircraft-related documents, including technical bulletins, safety guidelines, and maintenance manuals, are written in English. Mechanics with limited or no proficiency in

English may experience serious complications in performing their duties adequately. As such, this study seeks to address the following questions:

1. How significantly can gaps in English proficiency lead to misunderstanding of technical manuals and may compromise safety for mechanics?
2. May the implementation of translation services and targeted English training help ameliorating these gaps and improve the situation?

As a provisional answer, we put forward the following hypotheses:

1. Mechanics with proficiency gaps are more susceptible to misunderstand technical documentation, which could pose a threat to global safety.
2. Implementing translation services and accelerated training may help ameliorating language-related issues and improve safety outcomes for mechanics.

1. **English for Mechanics**

English for Mechanics also referred to as English for aircraft or English for maintenance is a specialized variety of English used within the aviation industry. It is employed by aircraft maintenance personnel, including mechanics, technicians, and engineers. This specialized language supports their demanding roles, which require intelligence and attention to detail. According to Broughton and Sayers (2018, p. 32) "Proficiency in English is crucial for aviation maintenance professionals to accurately interpret technical manuals and ensure compliance with international standards."

Mechanics are responsible for inspecting, repairing, and maintaining aircraft to ensure their safety and operational efficiency. Their work necessitates thorough understanding of maintenance instructions, which are often detailed in technical manuals written in English. Such responsibilities can be clearly summarized in the following table:

Table 1.1 Mechanics Different Duties

Charge	Description
Inspection	Perform detailed inspections of aircraft systems and components to ensure safety and compliance.
Maintenance	Carry out routine maintenance tasks such as oil changes, filter replacements, and fluid checks.
Repair	Diagnose and repair mechanical and electrical

	issues in aircraft systems, including engines and avionics.
Testing	Conduct functional tests to ensure aircraft systems and components are operating correctly.
Documentation	Keep accurate records of inspections, maintenance, repairs, and modifications.
Compliance	Ensure all tasks meet regulatory standards and manufacturer specifications.
Emergency Response	Provide immediate repairs and troubleshooting during emergencies to maintain aircraft safety.
Upgrades and modifications	Install and test new equipment or modifications as per technical directives.
Safety Checks	Perform pre-flight and post-flight checks to verify the aircraft's airworthiness.
Coordination	Collaborate with other maintenance personnel and aviation staff for effective operations.

Additionally, mechanics frequently interact with other aviation professionals who may only speak English, making proficiency in this language crucial for effective communication and collaboration. In this respect Gray (2020) state "Aircraft maintenance technicians must master English to effectively read and understand maintenance manuals and communicate with international teams."

3. The Role of English Reading & Comprehension Skills in Aircraft Maintenance

Both reading and comprehension skills are essential for aircraft mechanics, as their work relies heavily on accurately interpreting technical manuals and maintenance procedures. Similarly Kachru (1992, p.201) explains "English reading and comprehension skills are not just an advantage, but a necessity in global industries like aviation, where standardization relies heavily on the use of English for all technical and safety-related communication"

Understanding specifications and technical data is crucial for diagnosing and resolving aircraft issues effectively. In this regard Ellis (2020, p. 134) state "reading and comprehension skills in English are essential for understanding technical manuals and safety guidelines, which are often complex and require precise interpretation". All this will be explained in the table below:

Table 1.2 The Importance of Reading & Comprehension Skills for Mechanics (adopted from ICAO Document 8935, Manuel on the implementation of ICAO Language Proficiency Requirements 2018)

Motives	Justification
Understanding Technical Documentation	Mechanics need to accurately interpret technical manuals and specifications to perform maintenance tasks correctly.
Safety and Compliance	Proficiency in reading and comprehension helps ensure adherence to safety regulations and minimize errors that could lead to safety hazards
Effective Communication	Accurate comprehension of instructions and clear documentation are essential for effective collaboration and reporting.
Training and Skill Development	Ongoing learning and training require understanding complex materials and staying updated with new technologies and procedures
Problem-Solving and diagnostics	Understanding diagnostic manuals and troubleshooting guides is crucial for identifying and resolving aircraft issues effectively.

Mastery of these skills helps minimize errors that could lead to safety hazards. In the same line of thought Waters (198, p.45) illustrates “the ability to read and comprehend technical documentation in English directly impacts the safety and effectiveness of maintenance operations, as even minor misunderstanding can lead to catastrophic outcomes”

2. Methodology

2.1 Oran Es Sénia Airport: a Strategic Center for Economic Growth and Aviation Excellence in Algeria

Algerian aviation comprises numerous airports across the country, each offering a range of services to facilitate air travel. Among these, Oran Es Sénia Airport, also known as

Ahmed Ben Bella Airport, stands as a prominent intersection providing comprehensive facilities for both passengers and airlines. Located in Sénia district of Oran, this airport delivers various services including baggage handling, customs processing, and ticketing. It serves a diverse array of flights, covering regional, domestic, and international routes. Its operations extend beyond passenger services to include significant cargo handling, which plays a remarkable role in supporting the country's economy. The airport collaborates with various international airlines, such as Saudi Airlines, Qatar Airways, and Turkish airlines, offering global connectivity and contributing to Algeria's economic growth.

To support tourism, trade, and business travel, the airport handles several hundred flights to various international destinations. The volume of flights rises with the seasons, particularly during summer and holiday periods. This increase plays a key role in the country's economic development by enhancing tourism and promoting international business.

2.2 Study Informants

As previously explained, this study includes a sample of mechanics who voluntarily participated in providing the necessary data for our study. These mechanics were enrolled in technical streams during their education in technical secondary schools. Their ages range from 35 to 56 years old. Sometimes they received professional training from British instructors and to be tested at the end of each session. Based on their performance, they will be either promoted, or are required to attend additional training for the following year.

All of them received their initial training at the Blida Institute of Aeronautics that is committed to tutoring professionals in the field of aviation. It provides both theoretical and practical training in various aspects of aviation, including aerodynamics and aircrafts maintenance. The institute's primary focus is on meeting international standards, and it frequently collaborates with foreign experts, such as British instructors, who strive to deliver high-quality professional training.

2.3 Study Instruments

With the goal of assembling suitable answers to the objectives established earlier, the researcher employed an interview, comprehension tasks, and a self-assessment reading checklist. Each instrument has specific objectives, which will be outlined in the following table:

Table2. 1: **Study Instruments Overview**

Instrument	Objectives	Examples
The Interview	• Collect comprehensive perspectives on familiarity.	• Assess their answers on industry related-questions; • Review applied use of skills
Comprehension Tasks (Adopted from English for Aircrafts.System Maintenace 1+2 by Philip ShawCross)	• Evaluate mechanics 'grasp of key concept. • Test reading comprehension and retention.	• Judge their skills in understanding technical documents. • Judge understanding of airplanes parts
Self-assessment Reading Checklist	• Promote auto-evaluation of reading and comprehension skills. • Spot dimensions for refinements.	• Consider self-awareness of maintenance manuals. • Measure technical vocabulary familiarity.

It is important to note that the comprehension tasks were adopted from two books used in Teaching English for mechanics. The self-assessment-checklist comprised two parts. The first part was adopted from the CEFR framework, while the second part, related to mechanics-related industry.

3. Study Results

Once the data collection is complete, the research moves on to a detailed analysis phase, where the data examined to derive actionable conclusions and either to validate or refute the hypotheses.

3.1 Interview Results

A first step in the current study was to interview the participants to help them feel at ease and build trust through an open and reciprocal dialogue. It is important to note that the interview is structured into six rubrics, with each rubric containing two questions. Regarding the importance of the English language in their daily activities, all participants acknowledged its critical role, as all instructions, manuals, and safety information are in English. They recognized the negative outcomes that can result from weak English skills, especially when dealing with complex instructions. Some shared examples of failures due to misunderstandings, such as incorrect adherence to instructions, which led to additional time spent re-checking. One participant noted that this issue was resolved with the help of colleagues who prevented an aircraft malfunction.

Regarding common issues, especially among novice technicians, difficulties include struggling with complex and ambiguous technical terms. These challenges negatively impact their ability to perform tasks quickly and efficiently. To overcome difficulties, participants suggested various strategies. Some seek guidance from colleagues, while others suggest translation tools. Additionally, some recommend keeping a technical dictionary or glossary handy. One mechanic mentioned breaking down instructions into simpler parts to improve understanding, although this approach is time consuming.

3.2 Reading Self-Assessment Checklist Results

The next step was to distribute the reading self-assessment checklist to evaluate how participants assess their own reading and comprehension skills. Participants offer introspections on their reading skills based on the CEFR framework. Their answers differed. Most expressed positive attitudes towards comprehension; however; this was not true for vocabulary knowledge. Some mechanics demonstrated difficulties with technical vocabulary, summarization, and complex instructions. Many reported an inability to use complex terms in meaningful sentences, while others noted it was not difficult. For problem-solving, opinions were mixed; some found it easy, while others did not. In the final

part of the checklist which relates to applying skills in practice, not all participants showed readiness for any situation; only two indicated they were prepared for any situation.

3.3Comprehension Tasks Results

After following participants to self-evaluate their reading and comprehension skills, the next step was to assess their actual reading abilities and measure their effectiveness in applying comprehension to various situations. We used these two instruments to validate and compare the similarities and differences between participants' self-reported abilities and their actual skills. The researcher summarized a range of proficiency levels among participants:

- **Comprehension Questions**: some mechanics answered the questions correctly, while some struggled with certain details, and a few missed significant parts of the text due to lower proficiency and limited vocabulary.
- **Vocabulary Knowledge**: except for two participants who demonstrated moderate understanding of technical terms and could use them in sentences, others had difficulty understanding complex technical vocabulary and struggled to use these terms meaningfully in sentences.
- **Summarization**: some mechanics were able to summarize the text effectively, though they missed certain details. Others had difficulty summarizing the main points and tended to reduce the text to a few words, which damaged the meaning.
- **Accuracy in following instructions**: participants generally succeed in following instructions despite making some errors.
- **Problem-Solving**: most participants used relevant strategies t address misunderstandings, though they did not always apply these strategies effectively.
- **Application of Knowledge**: participants struggled with decision-making in the provided scenarios.

4. Conveying Results & Reflections

After collecting data using various instruments for different purposes, it is now time to validate or refute the previously stated hypotheses. It is important to emphasize that the primary aim of this paper is to examine the role of English reading and comprehension

skills in the daily activities of mechanics and to explore how deficiencies in these skills may adversely affect their performance and, consequently, global safety.

As discussed earlier, the primary aim of the three employed instruments is to assess mechanics' self-reflections on their overall proficiency with a focus on reading and comprehension skills, which are frequently used in their jobs. In addition, the comprehension tasks were utilized to endorse the participants' responses from both the interviews and the self-assessment checklist. The goal is to offer extra evidence to uphold the findings and supply a full understanding of their reading and comprehension abilities. Starting with the interview results, most of them acknowledge the importance of having certain level of English proficiency. However, they still encounter difficulties in understanding technical documents, especially with complex instructions. This issue was reinforced by the results of the reading-self assessment checklist and comprehension tasks. The findings align with the first hypothesis, which claims that Mechanics with proficiency gaps are more susceptible to misunderstand technical documentation, which could pose a threat to global safety.

Another crucial aspect of the study was identifying corrective measures to address these issues and improve the situation. Drawn from participants' responses from the interview, self assessment checklist results, and some comprehension tasks, suggestions included providing translation tools, dictionaries, or glossaries. Additionally, one participant suggested breaking complex instructions into smaller parts, though he noted it might be time- consuming. These results sustain the second hypothesis which states that implementing translation services and accelerated training may help lessen language-related issues and improve safety outcomes for mechanics.

5. Recommendations & Conclusions

As revealed by the results, efforts should be made to develop a comprehensive English language training programs that enrich participants' overall language skills, with an emphasis on reading and comprehension abilities. Such a course should initially emphasize general English, incorporating extensive reading practice and regular assessments to improve comprehension skills, including vocabulary development. Once participants have a solid grasp of general English, the training should gradually introduce more technical and complex content relevant to their field of work, including industry-specific jargon.

Additionally, incorporating translation activities, as recommended by the mechanics themselves, can further enrich vocabulary acquisition. It is advisable to prepare a glossary with the assistance of experts to facilitate the learning of specialized terminology. Collaboration between aviation experts and English language teachers is essential to provide relevant and updated materials, helping participants achieve a proficiency level that lowered risks and prevents any malfunctions. Regular assessments, with tests prepared and evaluated by both aviation experts and English language teachers, are crucial for ensuring high-quality outcomes and continuous improvement.

This case study explores the deficiencies that Algerian mechanics may encounter when using English, a language becoming increasingly essential in aviation. Although the new ICAO standards for mechanics are not yet implemented, the lack of proficiency in English remains a significant concern. Investigating this proficiency gap will lay the groundwork for future action or experimental research. Specifically, this study aims to develop and test a training course to assess any noticeable improvement in mechanics English skills.

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