

SCHOOL OF TECHNOLOGY
AERONAUTICAL SCIENCE

TALES FIGUEIREDO SILVA

EFFECTIVE AERONAUTICAL COMMUNICATIONS IN
MULTICULTURAL CONTEXTS AND THE ROLE OF
INTERCULTURAL COMMUNICATION AS A NON-TECHNICAL
SKILL

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EFFECTIVE AERONAUTICAL COMMUNICATIONS IN MULTICULTURAL CONTEXTS AND THE ROLE OF INTERCULTURAL COMMUNICATION AS A NON-TECHNICAL SKILL¹

Tales Figueiredo Silva²

Aline Pacheco³

ABSTRACT

Taking into consideration the ever-growing multicultural exchange that aviation involves its elements in, this tentative study features an attempt of assessing the extent to which cultural factors influence intercultural aeronautical communications. Through a digital questionnaire developed along the analysis on the literature existent on culture and communication in aviation, 18 pilots from 4 countries contributed to the assessment of intercultural communication difficulties and the levels of awareness sampled from the mitigating actions they reported taking at their workplace. The look at intercultural competence as a key factor in a non-technical skillset for aviation professionals is also a premise of the study towards raising the industry awareness. Responses from the questionnaire pointed out both common and distinct communication difficulties, as well as mitigating actions pilots already practiced to overcome these issues. Through the analysis, the way an individual perceives culture and its utterances was shown to be an important factor in the process of comprehension and maintenance of communicative effectiveness. The research shows how important is the development of communication skills and intercultural competence, regardless of the level of exposure to multiculturalism.

Keywords: Multicultural Environments; Intercultural Competence; Intercultural Awareness; Non-Technical Skills; Communication.

1 INTRODUCTION

Along the aviation historic background, many professionals operated in foreign countries, either in a national airline travelling abroad or as pilots working in other countries. This second case is a growing practice due to increasing demand and lack of balance between regions that educate these professionals and those who demand more than they can deliver, in terms of capable aviation professionals (ICAO, 2004; ORASANU *et al.*, 1997; ASSIS; PACHECO, 2020).

Operations onboard a plane involving pilots from different training and cultural backgrounds, including linguistic ones, may result in disparities regarding comprehension, effective communication, and an overall efficient management of available resources. These eventual problems not only involve pilots in their flight deck but also many other spheres and professionals in aviation, including Air Traffic Controllers, Ground Crew, Maintenance Crew; going even further into corporate environments, where the whole scheme of the operation is built (ASSIS; PACHECO, 2020; BOROWSKA, 2013; CHENG, 2018; ICAO, 2004; MONTEIRO, 2012; ORASANU *et al.*, 1997).

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² Graduando do Curso de Ciências Aeronáuticas.

³ Professora Orientadora, Doutora em Letras - Estudos da Linguagem pela Universidade Federal do Rio Grande do Sul (UFRGS). Professora Adjunta da PUC-RS.

This article is an analysis of the elements that should be considered in effective aviation communications taking place in multicultural environments in which pilots are inserted, such as day-to-day operations. Nowadays, multiculturally diverse environments, especially in aviation, pose both benefits and threats to the operation. Considering the current expectations from the market, many aspects such as training background, personality and experience overlay each other and come at play together, building the characteristics of a pilot as a professional.

Along aviation history, the Human Factor has been addressed by different perspectives and levels of importance. However, in the past decades, the Human Factors dome has been adopting more and more aspects that contribute to an overall human efficiency whilst at a piloting position. From both technical and non-technical standpoints, communication and integration between aeronautical interfaces are built based on human capabilities of engaging an effective link between people, machines, and environment. Moreover, human interactive features have been developed to a point where every single individual involved, and the way they comprehend the society, are critical to the operation (CHENG, 2018; ICAO, 2004; MERRITT, 2000; MONTEIRO, 2018).

Culture and its development are strongly tied to some known factors. ICAO Circular 302-AN/175 – Human Factors Digest n. 16 brings a very objective definition of culture:

A shared system of beliefs (what is true), values (what is important), expectations, and behavior meanings (what is implied by engaging in a given action) developed by a group over time in order to meet the requirements of living and operating in a particular (geographical) niche. (2004, p. 5)

Based on that, it can be inferred that groups of people living in different places and exposed to different circumstances develop different profiles. These profiles manifest distinct characteristics based on many metrics, for example, resource access. They project aspects such as language, educational achievement, as well as financial and moral status in a community.

The study is intended to address the cultural factors that present a challenge, both to pilots and their companies. Many aspects are involved in the aeronautical operations, despite the professionals' cultural background. The linguistic and cultural differences themselves, whilst only a part of the big picture, may contribute to an eventual breakdown at some level in the operation, taking part at a bigger organizational event (ASSIS; PACHECO, 2020; CHENG, 2018; MONTEIRO, 2012; MERRITT; MAURINO, 2005).

Moreover, there is an intent to analyze and further settle the importance of developing and fostering intercultural awareness (CHEN; STAROSTA, 1998) as a key component of an efficient professional skillset. Another objective of this article is to identify elements involved in aeronautical operations that play a part outside of the technical sphere influencing the effectiveness of communication in multicultural environments. According to Flin, O'Connor and Crichton (2008, p. 216): "Throughout the whole professional spectrum, specially across high-risk occupations, some widespread aspects are highlighted such as decision-making, situation awareness, communication, team coordination, stress/fatigue management."

The subjective nature of these aspects makes every single step of their diagnose and accountability harder for operators in general (including airlines and the pilots themselves). A correlation between intercultural communication skills and the non-technical idea by Flin, O'Connor and Crichton (2008) could be established, on an

attempt to further settle the importance of it to the aviation sector. By projecting an overview on the elements inserted in the daily aviation operations context, three basic pillars that guarantee air transport feasibility come at play. These are Safety, Efficiency and Economics. Of course, many other aspects derive from these three, highlighting the potential of anthropologic factors and tendencies influencing the so called pillars.

Elements such as cultural and personality differences are important characters in the creation of new crew arrangements in airlines that need foreign workforce to compose their high-demand service chain which itself deals with several cultural backgrounds. In addition, many teams may not be composed of culturally different individuals but are prone to the necessity of interacting in a multicultural context when dealing with outsiders at the vast aviation context such as ATCOs, corporate sectors, customers, and ground personnel. In this case, these “outsiders” are not necessarily included in the team but do take part in the teamwork, either by contributing or delivering challenges (MONTEIRO, 2012; PACHECO, 2018).

Additionally, we aim to sharpen the aeronautical community’s awareness at how cultural factors are, although abstract in many senses, important to be considered and acknowledged in order to maintain an overall efficient operation where culture shapes many characteristics of fellow professionals in the same workforce.

As a Brazilian student pilot, I have been exposed to many culturally diverse contexts. Either as an outsider who enters a local cultural scene or, in many times, at multicultural environments, where the cultural profiles are diverse and are built differently. As a consequence of globalization, every single individual is involved in multicultural interactions in many circumstances.

At the basic aviation training level, there seems to be an oversight regarding intercultural communications, both on a national level (countries with continental dimensions or areas of miscellaneous ethnics) and more importantly on the international one, where the core of multiculturalism is. Van Der Zee and Van Oudenhoven (2000) characterized the multicultural environment of work as “action oriented”, highlighting the importance of proactiveness when dealing with the most basic intercultural exchange.

Intercultural Awareness is a key component of intercultural communications. It takes part on the most basic and intrinsic steps of communication such as comprehension, where the spoken language/accents take a toll on detail assessment and therefore, actual communicative effectiveness (CHEN; STAROSTA, 1998). On this paper, by engaging on a Culture-general approach (CHEN; STAROSTA, 1998), reaching a broader view of the “global influence on human behavior” (CHEN; STAROSTA, 1998, p. 34) in the lens of aviation, the aim is to see how issues inherently tied to the industry affect its members. By shining a light on these concepts and practical examples (see 3.0 – Methodology and 4.0 – Results), the findings might pave the way for the development of interculturally aware and competent (CHEN; STAROSTA, 1998) professionals.

According to Zhu (2011), intercultural awareness grasps at one’s individual culture, but also others. Zhu also states that individuals in multicultural environments “should try by every means to cultivate empathetic concepts and precepts” (ZHU, 2011, p. 116), introducing a sense of Intercultural Empathy as an individual trait that is “prerequisite and assurance for effective cultural communication” (ZHU, 2011, p. 117).

ICAO refers to Linguistic and Communicative competence for speaking and hearing purposes as the gathering of four distinct factors: lexical, grammatical, semantic and phonological (ICAO DOC 9835, 2004). These last two being the most subjective of them, provided the wide variety of cultural contexts, even though

nowadays English is the Aviation Language, and in past years, there has been an effort to standardize the language use in aviation, although not all regions of the world have the same level of acceptance and adherence to the ICAO standards. To ensure communicative effectiveness and its necessary objectiveness in aviation, in 2004, ICAO published the Manual on the Implementation of Language Proficiency Requirements, document that regulates proficiency levels of Air Traffic Controllers and pilots (ICAO DOC 9835, 2010). This document further settled the grounds for current standard aeronautical communications.

Inevitably, the rise of English as the Aviation Language is used as a tool to standardize Aeronautical Communications at the operational level. It would be impossible to account for all communication issues derived from a variety of factors, including culture and language itself. However, in terms of standardization, the industry has steadily relied on English language for decades.⁴

The next sections will feature primarily a literature review on the topics comprised by this analysis, with a review on cultural factors that might take part in communication, followed by some insights from previous literature that specifically targeted intercultural communication difficulties and its consequences. Coming next, a short description of the methodology. It is outlined by a digital questionnaire that featured a reflexive approach on intercultural communication, its difficulties (and to what extent they go) and potential solutions. The results description is followed by an analysis section that will feature a discussion on the results and the topics from the literature review. As we will see, results seem to point to a high degree of importance of raising intercultural awareness, although it seems to already be well developed in some of the participants of this research.

2 LITERATURE REVIEW

2.1 Culture and Communication in Aviation

English has undeniably become a global language (HAZRATI, 2015). Even more so in the digital era, where information travels literally as fast as light and business can be conducted and settled in a matter of seconds. Overall, it is possible to affirm that due to the intercultural exchange in most of modern societal groups, people have long been learning second and third languages to be able to communicate with distinct groups they share the space with. Also, the development of Intercultural Awareness which creates Intercultural Competence, could be seen as a natural process that happens with individuals constantly involved in multicultural environments and its inevitable interactions. However, the development of intercultural competence and its traits, may be a complicated approach to groups that are historically isolated and often totally inclined to the local cultural and moral values.

The adoption of English has proven to be effective, although there have been studies (see PACHECO, 2018; MONTEIRO, 2012) regarding both the cognitive and cultural effect that the use of a second language to communicate has on pilots. Uneventfully, that might also happen to all the other related aviation personnel. It is important to assess how deep beyond the aircraft intercultural difficulties and issues go concerning the current aviation industry organizational culture.

Merritt and Maurino (2004, p. 152) said: "The social context is what allows people to manage their daily lives so efficiently by providing many short cuts based on

⁴ Exceptions apply.

familiarity.”. Based on this statement, which they later link with the concept of culture, given the wide variety of customs, procedures, beliefs and decision-making processes, different outcomes in terms of social organization may appear, confirming that “culture and context are really inseparable” (ICAO, 2004b, p. 5).

It is important to highlight how, inevitably, these different projections of culturally diverse individuals into the aviation industry may be creating new interfaces of interactions that build the multicultural element focused on this research. The experience factor must be undoubtedly addressed. In most cases, it is, especially regarding technical skills. However, the cultural component is often not addressed properly. Examples like communicative breakdowns or literature miscomprehensions just shine a light on the surface of possible mishaps in human interactions, independent on the interface being interacted with:

Experience at the interface builds familiarity and reduces uncertainty. With experience and exposure comes adaptation. However, adaptation is mostly based on cosmetic behaviors. It is a commented fact that cosmetic behaviors crumble under stress and a reversion to native behaviors takes place. The safety concern about dealing with cross-cultural interfaces through adaptation is obvious; in stress situations adaptation may become ineffective. (MERRITT; MAURINO, 2004, p. 156)

Evidently, the intercultural load on the behavioral response to stressful situations is a stakeholder on a row of influences, likely to be more pronounced in multicultural contexts. Monteiro’s (2012) focus on cultural interfaces, underlined as “many and diverse” (ICAO, 2004b, p. 8) when addressing the threats in multicultural contexts in radiotelephony communications, highlights some practical examples of cross-cultural interactions in aviation routine: “a) pilot-pilot (multicultural cockpits); b) pilot-air traffic control (international airspace); c) pilot-flight attendants (foreign crews); d) pilot-trainer (training in a foreign country)” (p. 46).

Among these are many others, increasingly diverse particularly due to globalization and migration. Crews composed of similar culturally built individuals are usually able to keep a certain level of reliability (MONTEIRO, 2012). Even though the possibilities vary, in order to keep reliability when adaptation (MERRITT; MAURINO, 2004) fails at interacting interculturally, the importance of making new habits (especially when in new cultural environments) comes up: “Understanding new habit formation and its implications in human interactions is at the heart of cross-cultural endeavors” (ICAO, 2004b, p. 8).

In multicultural contexts in aviation, individuals involved usually keep a great part of their own cultural background and experience with them as a backup (ICAO, 2004b). Meanwhile this backup and the adaptation (MONTEIRO, 2012) work for the most part, at the circumstance of encountering “members or artefacts (aircraft, procedures, regulations) from other cultures [...] cultural efficiencies are challenged” (ICAO, 2004b p. 2), as the uncertainty of a less predictable environment raises the required cognitive effort (ICAO, 2004b). Every individual’s way of putting their cultural background and its layers (ASSIS; PACHECO, 2020; HOFSTEDÉ, 1997) forward is different, which demonstrates how culture is deeply involved in one’s communications.

Meanwhile, other large contributors such as power distance may degrade several levels of awareness and communicative efficiency. In 1997, Hofstede defined power distance as: “the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally” (HOFSTEDÉ, 2001, p. 98). Every society will have an inherent level of power distance, varying between smaller groups and societal functions. The level of power distance in

a referred group is often observable based on the dependence of subordinates on superiors, ranging from an assistive and democratic relationship with low dependence in low power distance groups to an autocratic and paternalist relationship with a high dependence in high power distance groups (HOFSTEDE, 1991; 2001; CHENG, 2014).

Gudyknust (2005) concluded that strong social identities, which points in the direction of high power distances, potentially expose individuals to higher levels of anxiety and uncertainty. He also highlights that interactions based on social identities usually induces individuals to distance and differentiate themselves from “non-ingroup members”, eventually higher-ranking colleagues. Uncertainty goes directly against assertiveness, which is a much-valued trait in aviation professionals, especially pilots, who spend the entire technical training dealing with traditional instruction and facilitation techniques that specifically target assertiveness.

This trait undoubtedly plays a role not only in the technical bubble, where it is a great part of the decision-making process, but also to maintain communicative effectiveness and message transmissions assurance. In 1994, Smith conducted a study where pilots assumed First Officers and role-played with a Captain and a Flight Engineer through a pre-scripted trip. He observed that pilots (First Officers) that didn't go through assertiveness training in comparison with pilot that has the training performed significantly worse in a simulated “leader dominant” environment, where the First Officer or Flight Engineer at the occasion where intentionally left out of the decision-making process. Pilots that had undertaken the training were able to develop their own analysis of the scenario and transmit their contribution, despite the hostile environment for assertiveness, even more so considering the power distance portrayed.

All in all, independent on the level of intercultural exposure to intercultural interactions and unexpected situations, a professional of the aviation sector must be aware and develop skills that are able to address eventual culturally related issues in a preventive manner, as well as understand the cognitive impact it may raise.

The definition of Technical Skills across many professions is widely known. Each area has its own manner of defining the set of technical skills needed for a fluent and safe operation. Through many processes such as trial and error, interviews, questionnaires, report analysis etc. many areas of specialized work can find a set of non-technical skills that cover many aspects of normal work routine. These individual and group-played skills can increase the overall safety and may polish the whole operation, preventing breakdowns, raising awareness, and developing an efficient work environment. Throughout the whole professional spectrum, specially across high-risk occupations, some widespread aspects are highlighted such as decision-making, situation awareness, communication, team coordination, stress/fatigue management (FLIN; O'CONNOR; CRICHTON, 2008). These, as well as other aspects compose a wide spectrum of skills that carry the potential to further enhance safety and procedural assertiveness.

In aviation, the analysis developed on communication relies mostly on individual skills, which are revealed whenever studying team communication. In flight decks, individual skills contribute to the assessment of the team communication and work as a whole. By analyzing the intercultural factor in multicultural environments, it could be possible to identify at what level culturally related issues, miscomprehensions, misguidances, and incorrect delegations influence technical and non-technical performances.

2.2 Studies that approach intercultural communication difficulties

Communication itself is a vast concept. Issues and mistakes derived from poor communication skills are common (CHENG, 2014). It is no doubt that the development of communication skills and technical skills are far apart in terms of didactic approaches. On a flight simulated study in 1979, Smith concluded that overall crew performance relies heavily on quality of communication rather than technical proficiency or so called “stick and rudder” skills. In other words, a poor communication may be one of the most critical factors in air incidents/accidents.

Cross-cultural contact between crews, corporate, airport and ground personnel, as well as Air Traffic Controllers became the normal in the aviation sector, according to the Human Factors Digest n. 16 (2004). The relationship between communication, language and culture has long been looked at from many perspectives, and had its interfaces applied to safety models such as the SHELL (HAWKINS; ORLADY, 1993), the Reason’s (1997) model of Latent Conditions and the University of Texas Threat and Error Management (HELMREICH; KLINECT; WILHELM, 1999) by Meritt and Maurino (2005). Their analysis narrowed the gap between aviation safety and cross-cultural factors, showing that although back in the 20th century culture did not seem to be relevant, nowadays it plays a big role independently on the optics used to look toward the cultural aspect, be it an interface, a latent condition, or a threat.

The use of a second language as well as a “willingness to overlook nonstandard terminology” (ORASANU; FISCHER; DAVISON, 1997, p. 5) may heavily contribute to the lack of assertiveness and precision in communication. This overlook might be caused by an unanticipated miscomprehension or even linguistic unproficiency to detect deviations on the first place. Issues such as miscomprehensions due to Language/Accent, Partial Readbacks, Unfamiliar Terminology (differing from ICAO’s standard phraseology), Speech Act (distinct recognition of the message tone e.g. imperative/declarative) and Dual Language Switching (referring to the practice of switching between two languages in the same radiotelephonic environment, for example, a controller going back and forth between a foreign language for domestic traffic and English as a standard language for international traffic.) were highlighted by Orasanu *et al.* (1997) as cross-cultural communication problems in aviation.

Three ways in which these examples of problems might take a toll on communicative effectiveness were highlighted. An issue concerning the message transmission may prevent information from being delivered to the interlocutor. On another hand, a message might be transmitted accordingly, but not processed or comprehended as meant. Finally, messages may be exchanged and processed correctly but communicants fail to convert the message exchange into a shared understanding of the situation, which is a key component of the achievement and maintenance of Situation Awareness⁵ (ORASANU *et al.*, 1997).

Communication is notably a crucial aspect of aviation safety and efficiency. Intra-cockpit communication can be even more decisive as per the absence of a third-party element that overlooks the process. Pilot errors in the flight deck are likely to be intimately tied to poor team communication and coordination rather than technical proficiency (COOPER; WHITE; LAUBER, 1980; CHENG, 2018) Also, in regards to communication, Reason’s (1997) approach of mitigating errors on a system-wide basis could shift the balance from concentrating efforts on incorrect/unsafe individual actions

⁵ Situation Awareness as the “awareness of the condition of one’s aircraft systems and one’s location in relation to the intended course, weather..., terrain, runway conditions and traffic...” (ORASANU *et al.*, 1997, p. 7).

to a more group oriented analysis, “as unsafe acts are only the proverbial tip of the iceberg” (MERRITT; MAURINO, 2005, p. 160).

3 METHODOLOGY

In order to maximize data collection quality, an exploratory and qualitative methodology was designed, with some insights on quantitative data to better outline profiles and experience levels analyzed. The aim was to index issues related to intercultural communications and at what level they actually influence those who perform a career in multicultural aviation environments.

A form was created containing 10 questions. Questions 1 to 3 objectively collected quantitative data, regarding flight experience, current base country, as well as previous countries respondents had experience before. Questions 4 to 10 focused mostly on qualitative data, engaging a reflection around intercultural communication difficulties involved in their operation, as well as to what extent these difficulties go beyond (or not) the flight deck. Additionally, the questionnaire induced respondents to briefly describe actions they already take to mitigate these difficulties. Based on Flin, O'Connor and Crichton concept of Non-technical Skills (2008), respondents were also inquired if they believed in Intercultural Communication as a Non-technical Skill.

Provided that the questions had the potential to yield both quantitative and qualitative data, different approaches took place when processing results. Questions with possible answers “Yes” and “No” composed quantitative data on cultural aspects involved in aeronautical environments, more specifically, multicultural ones. Data requested in questions 1-3 further complemented qualitative data from questions 4-10 in the analysis, on an attempt to dive into practical examples of difficulties as well as mitigating actions already taken by active professionals in the industry and relate them to the current literature that concerns intercultural communication difficulties.

Both types of questions (essay and multiple-choice) made a wide variety of qualitative data achievement possible. It brought up some factors previously not addressed in this article. By assessing unexpected factors of the intercultural communication, it was possible to highlight specific occasions where the cultural factor is not so obvious, but certainly is involved in communication and operation, as well as in extraordinary situations.

Data collection took place between August 26th and September 25th, 2022. The questionnaire was developed on a digital platform, with a 10-minute completion limit. Personal data unrelated to the research was not requested and was kept anonymous. Neither the public nor the researchers had access to respondents' identities, which was also kept anonymous throughout the whole process. A total of 18 respondents from different backgrounds and flight experiences filled the form, at an average time of 6:45 to complete it.⁶

4 RESULTS

In this section, results will be displayed according to the order of questions disposed in the questionnaire (3.0 - Methodology). Quantitative data as well as base

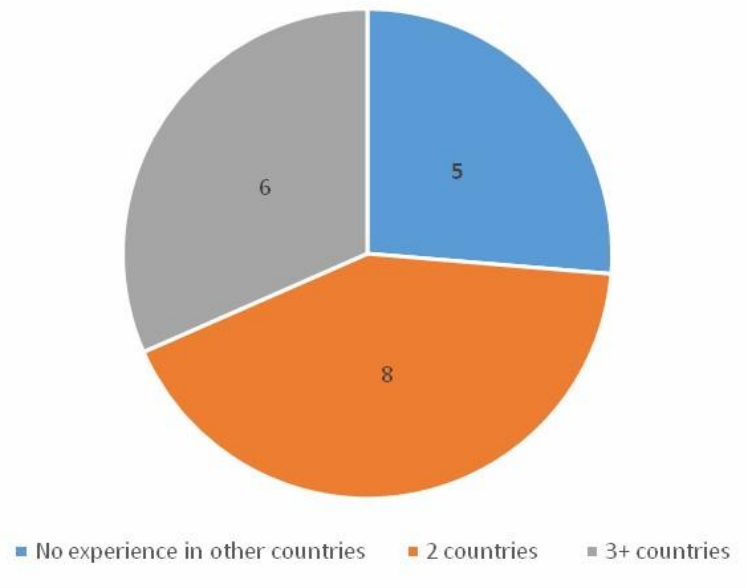
⁶ It should be noted that the study intent was to gather more responses from pilots to the questionnaire. It couldn't be concluded the reason why the questionnaire didn't get the adherence planned in the beginning. It could be from an overwhelming work schedule or fear concerning current public/corporate policies regarding contributions and statements.

countries and previous experiences reflect the current status at the time the questionnaire was filled.

Base Country and Previous Experience

Out of the 18 respondents, 8 were currently based in the United Arab Emirates⁷, 6 in Brazil, 3 in Qatar and 1 in Hong Kong. Chart 1 shows the arrangement of respondents regarding previous experiences:

Chart 1 – Experience in different countries



Out of the 18 pilots, 5 respondents reported they only had working experience in their current country. 8 respondents have had experience in at least 2 countries. 6 respondents reported having worked in at least 3 different countries. Previous countries in which the pilots had experience figured various areas around the world such as Canada, Brazil, The Netherlands, Qatar, Turkey, Indonesia, USA, Taiwan. Many of these actually known for recruiting international crew members quite often.

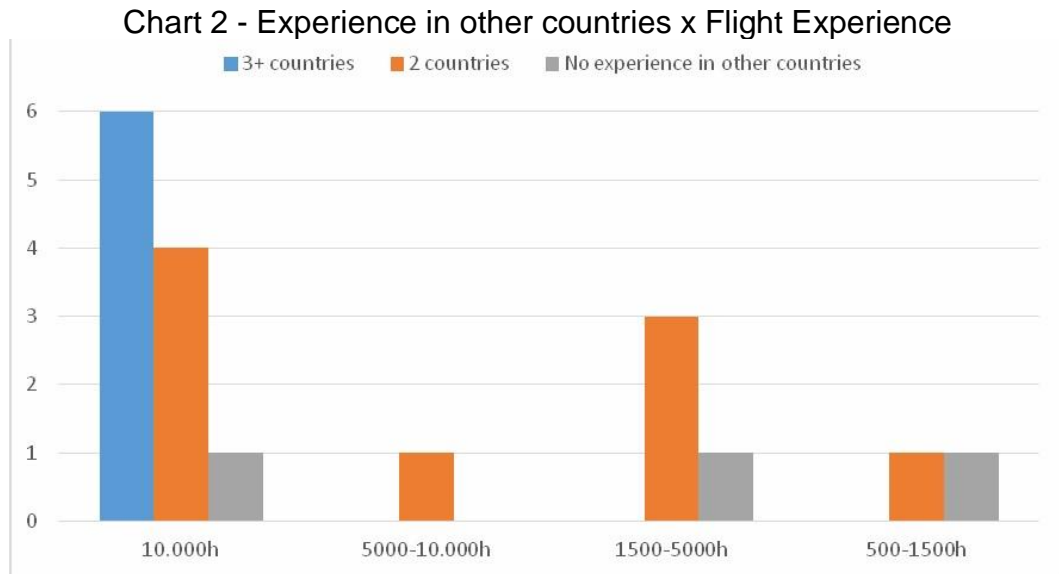
Flight Experience

The flight experience section was divided in groups, forming the options available in the question:

- 10,000h +
- 5,000-1,0.000h
- 1,500-5,000h
- 500-1,500h

Out of the 18 respondents, 11 reported having more than 10,000 of flight time, 4 reported between 1,500 and 5,000 hours, 2 reported between 500 and 1,500 hours and one pilot reported between 5,000 and 10,000 hours. Chart 2 relates experience in different countries with flight experience in hours by individual.

⁷ May be referred to as UAE.



Intercultural Communication Difficulties

When asked about intercultural communication difficulties, different types of issues were related by the respondents. A different depth of detail could be observed in the answers. Some specifically cited problems such as difficulty in comprehension due to strong accents, where 5 answers contained “accent” as a difficulty. Moreover, speech pace, also was a recurring aspect, reported by 3 respondents. Respondents mentioned these in answers such as:

“Speaking fast.”
“Accent, slangs, and speed.”
“Deal with different accents”

Other intercultural difficulties uttered throughout the answers, as well as reoccurrences of previously seen examples. In one of the answers, a pilot noted how miscommunication may be induced by *“silent language and gestures”*. According to the respondent: “Many cultures have differences in those aspects, so even if both speakers have a good fluency in English, they can still miscommunicate when using the right words.” Another pilot summarized: *“Wobbling heads different meanings all over the globe”*.

Aside from the non-spoken language, which seems to be an important communication tool, issues may derive from the improper use of standardized languages such as the Standard Phraseology in English. One pilot linked *“accent and non-standard phraseology”* as difficulties.

When prompted about actions they took to mitigate intercultural difficulties in multicultural environments, different pathways emerged in terms of approaches to mitigate these difficulties, thus preventing operational issues. Some answers presented non-operational practices such as taking language classes and updating communication skills, as well as noted by one respondent: *“Quickly assess your interlocutor level of English to adapt your vocabulary and speed.”* A cultural background introduction to other parties involved in the communication process might be valid to ensure comprehension and instigate intercultural awareness.

Speech rate seems to be a frequent aspect that is both an issue, but also a way of ensuring a successful and efficient communication. Speech pace related actions

shine a light on how these professionals feel and react when involved in a degrading communicative event. Some answers involved requesting a slower speech pace or asking to say again. On the other hand, some pilots demonstrated proactiveness, by engaging on tools that prevent issues at transmission, thus eventually reducing reception difficulties.

Respondents mentioned approaches such as:

“Ask to speak again and slow.”

“Ask to say again. Speak slowly so the other part may follow.”

“Speak slowly, if have any doubts ask for say again Please”

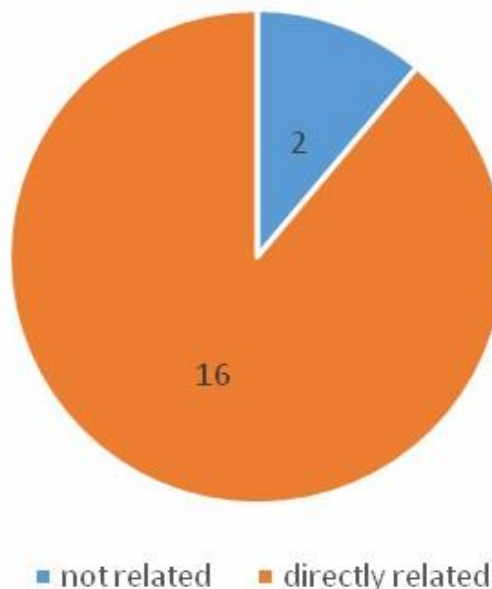
“Crosscheck receiver’s understand of information. Clarify received input.

Adapt verbal and nonverbal communication to culture...”

Answers more robust regarding the actual interactions in aeronautical multicultural environments uttered as respondents mentioned well established practices such as *“Using the standard communication”, “Std Call-Outs, English Proficiency Test”, “...use standard RT”* and using *“CRM as a tool for the benefit of safety...”*⁸.

Chart n. 3 shows that 16 out of the 18 respondents believed that language and cultural differences are directly related to communication breakdowns and/or losses of situational awareness.

Chart 3 – Language and Cultural differences involvement⁹ in communication breakdowns and/or losses of Situational Awareness

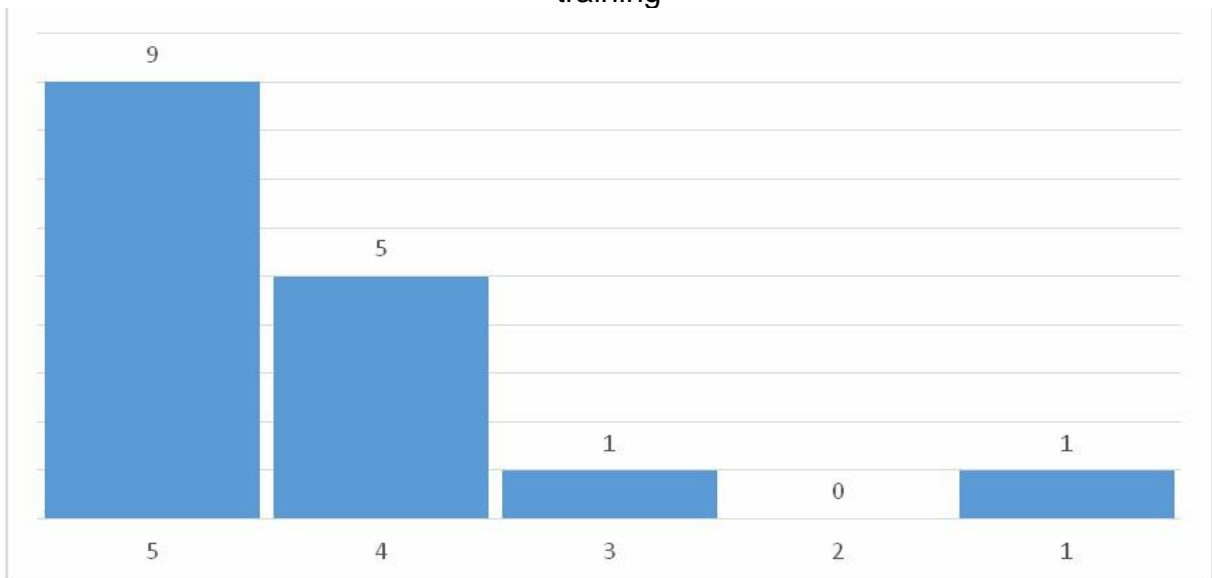


The 16 who selected “yes”, thus, directly related, were asked about the importance of the adoption of intercultural communication skills and multicultural teamwork in aviation personnel training. The question had a scale, in which respondents had the opportunity to rate between 1 and 5 about the importance of the referred type of training. Chart n. 4 presents how respondents evaluated the aspect.

⁸ Free translation of the sentence originally answered in Portuguese.

⁹ In multicultural environments.

Chart 4 – Importance of the adoption of Intercultural Communication skills in aviation training



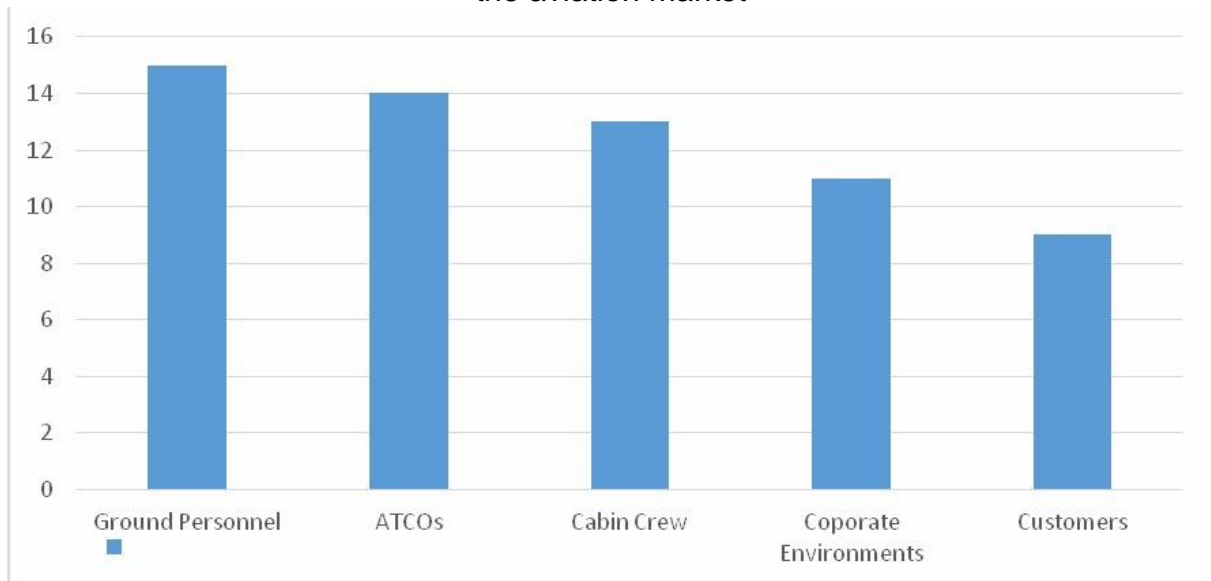
For research purposes, we classified the scale from 1 – not important/dispensable to 5 – very important. 9 respondents selected 5 on the scale, 5 selected 4 on the scale, 1 selected 3 and 1 selected 1. No respondents selected 2 on the scale. Out of the 18 respondents, 17 reported that the intercultural interaction issue in multicultural contexts goes beyond the flight deck sphere.

On an attempt to evaluate how far the intercultural communication difficulties go, we asked respondents if they experienced some sort of difficulty with the following groups:

- Cabin Crew
- Ground Personnel
- Air Traffic Control Organs
- Corporate Environments
- Customers

Each respondent had the opportunity to select either one of them, all of them or none. Chart n. 5 shows how often respondents marked each of the groups above:

Chart 5 – Intercultural Communication difficulties experienced with different groups of the aviation market



A third part of the group reported having had difficulties with all the 5 groups, 6 in total.

Finally, based on Flin, O'Connor and Crichton's (2008) idea of Non-Technical Skills (Identifying Non-Technical Skills), we asked respondents if they believed in intercultural communication as a non-technical skill. Out of the 18 respondents, 15 answered "Yes".

5 ANALYSIS AND DISCUSSION

The analysis and discussion in this section is focused on shedding some light on important findings from the results section (see 4.0 - Results) by trying to establish a connection between the questionnaire questions/responses (see 3.0 – Methodology) and the theoretical framework from the Literature Review section (see 2.0).

Although experimental, this study was able to cover a significant variety of pilot profiles (18 total) ranging from different levels of flight experience (see 4.0 – Results – Flight Experience) as well as different location backgrounds across at least 9 countries in different areas of the world. Provided the relatively wide portfolio of perspectives, distinct experiences in multicultural contexts could be observed, with some converging ideas regarding intercultural communications and its related issues. Therefore, two major topics that converge analytically come into perspective. So, for analysis purposes this section will be divided in two, featuring a look into Intercultural Communication Difficulties

Intercultural Communication Difficulties

Many studies have extensively covered cross-cultural communication issues in aviation (BOROWSKA, 2020; CHENG, 2018; MERRITT, 2009; MERRITT; MAURINO, 2004; MONTEIRO, 2012; ORASANU *et al.*, 1997; PACHECO, 2018). Orasanu *et al.* (1997) study, for example, gathered a total of 100 reports from the ASRS system ran by NASA that is fed by voluntary reports. They used "Culture" and "Communication problems" as key-words in the search and compiled a variety of categories that were also found occurrences of in this study. As the analysis goes, results from this paper

will be correlated to categories from their study on an attempt to look into how prominent some issues still are, 25 years after their report.

When asked about intercultural communication difficulties in their work environment, pilots mentioned difficulties with different degrees of depth in terms of detail. Some appeared quite often given the size of group. One utterance appeared 5 times, a difficulty in comprehension due to strong/different accents, possibly due to the lack of familiarity (MERRITT; MAURINO, 2004). In Orasanu *et al.* (1997) study, a whopping 47 out of the 100 reports mentions Language/Accent as a cross-cultural problem, by far the most frequent occurrence, as it also was in this research. Speech rate, referring to the speed at which a person speaks, was mentioned 3 times as a problem by the group. Other difficulties related to Language/Accent uttered such as “Language Proficiency”, “Adaption to language, culture and the country itself”.

The “inability to convey information clearly in a concise and accurate manner”, as mentioned by one respondent, seems to be heavily tied not only to language proficiency and accents but also to the non-spoken language, that according to the respondents, varies a lot in different locations. One respondent essentially permeated, in his own words, the concept of local, heavily tied to culture, non-spoken languages/codes and expressions: “Wobbling heads have different meanings throughout the globe.”, as every individual has a different way of expressing themselves and their cultural background (ASSIS; PACHECO, 2020; HOFSTEDE, 1997).

Another pilot gave a more in-depth perspective of the connection between linguistic issues and individual interpretative approaches: *“Most of our understanding comes from processing all the data received, then comparing with our common basis...”*.

When it mentions “comparing with our common basis”, a relationship between this citation and the shortcuts based on familiarity (MERRITT; MAURINO, 2004) or in this case, the absence of them, appears, given the culturally distinct nature of the elements involved in the kind of degraded communications the respondent mentioned. Naturally, in environments with a lower frequency of intercultural ‘shocks’, this particular issue seems to have a lower influence, as individuals with similar cultural foundations tend to keep a reasonable level of reliability (MONTEIRO, 2012).

Continuing, the respondent from the previous citation characterized more issues in intercultural communication:

“...This includes body language when applicable or all the voice features like pitch and tone. Many cultures have differences in those aspects, so even if both speakers have a good fluency in English, they can still miscommunicate when using the right words. In other cases which are more common, we have different meanings for the same words, depending of the place and culture, so when people try to translate them, they can get it wrong.”

One key aspect that is notably widespread as a difficulty in aviation, even more so in multicultural environments is the lack of adherence to the ICAO standard phraseology (ICAO DOC 9835, 2010). It has been covered thoroughly in some studies about communication in aviation (BOROWSKA, 2020; MONTEIRO, 2012; PACHECO, 2018), and overall, communication issues derived from non-standard phraseology affect a variety of groups, including environments of a single culture/language, as it has been noted that native speakers of English, in their country, for example, may use

local jargons and deviate from the standardized language, even when there is no multiculturalism in the environment.

It can be inferred that cross-cultural contact may result in difficulties in some cases, especially if considered the issues already mentioned before in this article taking a toll on proactiveness in some degree, that, when allied with the use of non-standard phraseology or simply overlooking it (ORASANU *et al.*, 1997), may pose an even larger threat and pave the way for miscommunication events. The fact that Pilot errors in the flight deck are likely to be tied to poor team communication and coordination rather than technical proficiency (COOPER; WHITE; LAUBER, 1980; CHENG, 2014) demonstrates once again the importance of communication and its assured effectiveness as a key factor in the aeronautical world. The results shown in Chart 3 (see 4.0 – Results) suggest a confirmation of that idea since 16 of the 18 pilots believed in the direct involvement of language and cultural differences in communication breakdowns and/or losses of situational awareness.

These 16 pilots who believed in the stated involvement were asked to rate the importance of the adoption of intercultural communication skills and multicultural teamwork in aviation personnel training on a scale from 1 to 5, on a crescent degree of importance. The results may be visualized on Chart 4 (see 4.0 – Results). In sum, the adoption of this kind of training was highly praised, with 9 out the 16 respondents selecting 5, the highest degree of importance on the scale. The objective of this scale was to measure acceptance of the group to this kind of training rather than assess any previous experience with the referred kind of training or suggest the training to be taken.

Cross-cultural contact between different groups such as crews, corporate sectors, airport ground personnel, Air Traffic Controllers, etc. became the norm in aviation (ICAO, 2004; MONTEIRO, 2012). One of the questions in the questionnaire had the intent to evaluate how far the intercultural communication goes regarding difficulties experienced with different groups of the aviation industry. The groups analyzed were:

- Cabin Crew
- Air Traffic Control Organs
- Customers
- Ground Personnel
- Corporate Environments

Chart 5 (see 4.0 – Results) shows to what extent the group selected the groups above. Out of the 18 respondents, 6 reported having had intercultural communication difficulties with all the groups, suggesting that the intercultural communication issue goes far beyond intra-cockpit communication. Ground Personnel was the group that affected pilots the most, with 15 reports followed by, on a decrescent scale, ATCOs (14), Cabin Crew (13), Corporate Environments (11) and Customers (9).

Mitigating efforts and Intercultural Competence Assessment

Distinct utterances showed up when pilots were asked about actions they already took to mitigate their difficulties (see 4.0 – Results). Answers included non-operational approaches such as taking language classes and updating communication skills. As per the speech rate as a difficulty, it was also found that the speech rate adjustment might be an alternative to facilitate comprehension. It could be gathered from the answers that a slower speech rate may ensure efficiency in the receiver's comprehension. Pilots reported either requesting a slower speech rate or proactively slowing their rate for others: *“Ask to speak again and slow.”*, *“Ask to say again. Speak*

slowly so the other part may follow.”, “Speak slowly, if have any doubts ask for say again Please”.

Throughout the answers, many of the responses demonstrated traces of intercultural competence and awareness. Important aspects that ease communication were proposed such as:

“Quickly assess your interlocutor level of English to adapt your vocabulary and speed.”

“Know in advance, the culture I am going to work with, or even the background of the person who will be part of the team.”

“Trying to give a cultural background to the listener so that he might understand your expressions.”

“Increase acceptance of diversity”

“Crosscheck receiver’s understand of information. Clarify received input. Adapt verbal and nonverbal communication to culture (...) use standard RT.”

These answers shed a light on the fact that there are interculturally aware and competent in the industry. One course of action to reduce communication issues in multicultural environments could be fomenting a widespread engagement of this intercultural skills development movement, raising the overall awareness of the industry towards the problem. It could not be concluded if the development of these skills was individually triggered or result of some sort of training. Kealey and Protheroe (1996) argued that the literature on the subject of intercultural training and its impacts is deficient, and by the time of their research, no extensive study had been conducted with a fair amount of reliability. In 2000, Merritt noted that the CRM training programs failed to address cultural differences due to a disregard of cultural and professional backgrounds.

The pilot group also pointed out well-adopted procedures by the aviation industry that hold the potential of preventing poor communication. Standard Callouts, English Proficiency Tests, Standard Phraseology, Crew Resource Management techniques are examples mentioned that seem to have been effective and are result of a standard-oriented industry both in terms of operational procedures and also communication, especially after ICAO’s doc 9835 (2010) that as mentioned before in this article, set the standards for the use of English as the aviation language globally.

A remarkable approach put forward by some respondents was towards a more accommodated behavior, figuring statements such as: “Sometimes no action to mitigate.” and “...As for accents, it’s also a matter of getting used to it”. In 2004, Merritt and Maurino noted that “experience at the interface builds familiarity and reduces uncertainty” (p. 156). This statement could confirm the pilots statements, but, provided the nature of adaption as a cosmetic behavior, this accommodated approach of letting adaptation take over or “getting used to it” exposes the danger of this kind of behavior as “It is a commented fact that cosmetic behaviors crumble under stressful situations” (MERRITT; MAURINO, 2004, p. 156).

One of the premises of this article was to try and categorize intercultural communication and its related aspects: intercultural competence, awareness and sensitivity (CHEN; STAROSTA, 1998) as a Non-Technical Skill based on Flin, O’Connor and Crichton (2008) definition: “Throughout the whole professional spectrum, specially across high-risk occupations, some widespread aspects are highlighted such as decision-making, situation awareness, communication, team

coordination, stress/fatigue management.” (FLIN; O’CONNOR; CRICHTON, 2008, p. 216). The questionnaire proposed, in the last question, the following question after Flin, O’Connor and Crichton (2008) definition mentioned in this paragraph: “Based on your experience in the growing globalized aviation sector, do you believe in intercultural communication as a non-technical skill?” Out of the 18 respondents, 15 of them marked ‘yes’ and 3 ‘no’.

In order to attempt a settlement to this correlation, one must take a look at the examples highlighted by Flin, O’Connor and Crichton (2008). Regarding decision-making, this aspect might be affected by the raise in cognitive effort that multicultural environments and even artifacts from different cultures cause. The levels of uncertainty are prone to growth when dealing with members of different groups (CHENG, 2014; ICAO, 2004; GUDYKNUST; SAPHIRO, 1996; MONTEIRO, 2012). A higher level of required cognitive effort also relates to stress/fatigue management, suggesting that professionals acting in multicultural environments are more prone to a higher cognitive load that goes beyond the technical activities.

Regarding communication and team coordination, it has been thoroughly settled along this analysis that communication and team coordination are subject to cultural factors and its subsections such as language extensively, which also suggests the reliance of technical performance on non-technical traits that have a direct impact on communicative effectiveness (BOROWSKA, 2013; CHENG, 2014; ICAO, 2004; MATHEWS *et al.*, 2021; MONTEIRO, 2012; PACHECO, 2018). By all means, intercultural communication seems to fit perfectly into the definition of a Non-technical skill that could and should be accounted for as a must-have trait for professionals in the aeronautical setting.

6 FINAL REMARKS

The main premise of this study was to address cultural actors that present a challenge, both to pilots and their companies. It has been demonstrated that cultural factors and its bad management are indeed part of a bigger picture, exerting an influence in some degree in communication effectiveness. This has been confirmed both through a thorough literature review and also by the methodology adopted. Furthermore, the intent to accomplish a broader view of concepts related to the multicultural world such as intercultural awareness and competence was fulfilled. Thereby considering that correlations between existing literature and the traces of these traits (and their positive impact) showed up in the researched group.

The application of a questionnaire that evoked intercultural communication difficulties and the actions taken to mitigate them was able to gather current perspectives and hurdles associated with the aeronautical world communication. The results of the study have remarkably shown similarities to many of the available literature concerning culture and intercultural communication. Many conclusions, including reported issues, seem to be time transcendent That is quite concerning, given the high degree of technological and infrastructural achievement throughout the decades and the apparent little improvement or even, the also apparent, lack of growth in awareness to culture and its influences.

All the problems mentioned seem to revolve to a single thing: One’s culture and way of interpreting the world based on their background. One possible solution to this could be the development of intercultural competence and awareness (BOROWSKA, 2013; CHEN; STAROSTA, 1998; ZHU, 2011) towards an individual and proactive way

of developing and practicing facilitation of comprehension and consequently, communication as whole.

The framing of Intercultural Communication through the optics of the non-technical standpoint seems to be conveniently tied up. Although small-sized, the researched group showed a prominent level of belief in the categorization of intercultural communication as a non-technical skill (FLIN; O'CONNOR; CRICHTON, 2008) after a thorough and reflexive questionnaire on the manner. This fact highlights the credence of pilots and potentially other aviation personnel in the potential that the development a non-technical skillset might have on improving their performance.

The analysis of the questionnaire responses demonstrated the efficiency of a digital questionnaire in reaching different profiles of pilots from different areas and experiences around the globe. This fact proved to be a key factor in gathering responses that had their origin in the same difficulties and issues, despite the lack of relationship between participants. The study could have been more conclusive in certain aspects if a larger group had answered the questionnaire. However, the study had no issues in establishing correlations and observing difficulties and solutions on the optic of available literature.

The achievement of higher levels of awareness, in the case of this study, more prominently intercultural awareness, features not only the development of the research, but also the practice of recommendations found here and confirmation by future articles. Future research and researchers have a long way on defining the scope of intercultural communication and its utterances like intercultural awareness and competence. This was a similar conclusion to Chen and Starosta's conclusion back in 1998, where they comprised the importance of correctly defining and addressing these aspects. The essence of culture starts with each individual and how they perceive their surroundings. By contributing individually towards a better collective status, culture evolves, and the ties that characterize the human eusociality grow stronger.

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ANNEX - QUESTIONNAIRE

Name: XXXX

Base country:

Experience(briefly list aircraft and flight time):

- 1) What sort of intercultural communication difficulties are involved in the everyday operations at your workplace? Briefly list actions you take to mitigate them.
- 2) Regarding intercultural interactions, do you believe that factors such as language and cultural background differences are directly related to communication breakdowns and/or losses of situation awareness either by one individual or the whole crew?

()Yes ()No

- a. If positive, on a scale from 1 to 5, how important is the adoption of intercultural communication skills and multicultural team work in aviation personnel training to you?

1	2	3	4	5

- 3) Does the intercultural interaction in a multicultural context issue go beyond the flight deck sphere?

Yes No

- 4) Are there common difficulties related to the following groups? Mark the ones you have experienced some sort of difficulties with:

- a. Cabin Crew
- b. Ground Personnel
- c. Air Traffic Control Organs
- d. Corporate Environments
- e. Customers

- 5) Throughout the whole professional spectrum, specially across high-risk occupations, some widespread aspects are highlighted such as decision-making, situation awareness, communication, team coordination, stress/fatigue management (Identifying Non-Technical Skills. Flin, O'Connor and Crichton 2008)

Based on your experience in the growing globalized aviation sector, do you believe in intercultural communication, as a non-technical skill?

Yes No