A Qualitative Ethnographic Case Study Exploring the Hispanic/Latinx Interpretations of Collegiate Aviation Safety Culture

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Abstract

Through a combination of ethnographic principles and a qualitative case study structure, this study strives to understand how Hispanic/Latinx aviation students perceive the current aviation safety culture in their flight training program. Grounded in the reciprocal safety culture model, the researchers attempt to answer how does Hispanic/Latinx culture influence perceptions towards commitment to aviation safety? and what are Hispanic/Latinx students' perceptions of their ability to influence aviation safety culture? Three major themes emerged from the data: behavioral signs of safety culture at the collegiate level, obstacles to a sound safety culture, and methods to improve the safety culture. Moreover, factors such as individualism, masculinity, access to economic resources, and language were prevalent in the findings on how Hispanic aviation students perceive their collegiate flight training safety culture. Future studies should explore the perception of different ethnic groups of aviation students at various geographical locations to identify any added layers of threat, behavioral attitudes, and safety compromises related to flight training.

Keywords: aviation safety, culture, Hispanic/Latinx, ethnography

Safety is an exercise and an aspiration to protect people's integrity through preserving life, thus a continuous way of thinking among individuals. Similar to this continuous way of thinking, there is education, as individuals never stop learning and adjusting their behavior. Along these lines, the combination of safety, education, and diversity and inclusion practices plays a significant role in aviation accident prevention. Such a role is connected to *safety culture*, which allows for a group of people to learn, without blame, from others' errors, thus improving safety as a whole (Aburumman et al., 2019; Langer, 2021; O'Toole, 2002; Reason, 1998). Safety culture is the product of individual and collective values, competencies, and behaviors that determine organizational commitment to safety (Choudhry et al., 2007; Cooper, 2000). Safety culture places a high level of importance on safety attitudes and thinking that are shared within people from the same geographical location or with the same philosophy (Langer, 2021). Inclusively, safety culture is understood to drive people's attention into a positive or a negative stance, where a positive safety culture can result in improved workplace health and safety, as well as an improvement in organizational performance (Choudhry et al., 2007; Hofmann et al., 2017). Conversely, it could be argued that a negative or poor safety culture could lead towards widespread procedural violations and the failure of an organizational safety management system.

Due to the different processes and procedures within an industry, safety culture is not always the "holy grail": an individual's cultural ideas may not always allow for safety to lead, as there may be characteristics that undermine safety culture. For example, Butler et al. (2007) found "fairly extensive cultural moderation of both the correlates of habitual suppression and its immediate consequences during social interactions" (p. 44). The aviation industry, among many other industries, is cemented in safety practices. Nevertheless, the importance of safety in aviation cannot be underestimated as safety culture is, possibly, the first and last line of defense against injury and loss in the workplace (Reason, 1998; Wang, 2018). Thus, when culture and safety are brought together, a new issue could develop. This issue, contrary to cultural tendencies, could result in conflicts that may affect the overall safety performance and behaviors of a group of individuals within the same community. In other words, if safety culture is diametrically divergent on processes that require precise input and quick thinking, mishaps may occur.

This ethnographic case study investigates aspects of a safety culture through a diversity and inclusion lens, specifically a cultural lens, by illustrating the importance of education about aviation safety (Freiwald et al., 2013) related to how Hispanic/Latinx aviation students perceive the current aviation safety culture in their flight training program. The research questions guiding this study are: (1) How does Hispanic/Latinx culture influence perceptions towards commitment to aviation safety? (2) What are Hispanic/Latinx students' perceptions of their ability to influence aviation safety culture? At this stage in the research, safety culture will be generally defined as "the corporate atmosphere of culture in which safety is understood to be, and is accepted as, the number one priority" (Cooper, 2000, p. 113). The primary theory guiding this study is Hofstede's (2001) theory of cultural dimensions.

Review of the Literature

The completed literature review included empirical and statistical data from several academics who focused their research on safety culture (Adjekum, 2017; Adjekum & Fernandez Tous, 2020; Adjekum et al., 2015; Cooper, 2000; Reason, 1998) and education/training (Adjekum, 2014; Freiwald et al., 2013) within collegiate flight training programs (FTP). As safety culture covered both individual and collective principles about partakers within these flight training programs, it was possible to identify essential data pertaining to safety as well as to provide an explanation of the completed research studies. It was considered fitting to address current educational safety culture aspects at other organizations to analyze if these help mitigate the risks of incidents and accidents pertaining to Hispanic/Latinx interpretations of collegiate aviation safety culture.

Collegiate Aviation Safety Culture

To increase awareness of aircraft incidents and accidents, the United States Congress passed the Air Commerce Act of 1926. The act was the first step of many to increase safety in aviation. In a period deemed Thirteen Tragic Months, 282 fatalities were related to eight significant crashes from notable airlines up to January of 1995 (Stolzer & Goglia, 2015). The increase in aircraft incidents and accidents caused a reevaluation of regulations and safety systems in place at the time. Some of the proactive programs that emerged from the reevaluation of aviation safety regulation include the Advance Qualification Program, Air Transportation Oversight System, Safety Management Systems (SMS) (International Civil Aviation Organization [ICAO], 2018), Aviation Safety Action Program, and Flight Operations Quality Assurance (Oster et al., 2013; Stolzer & Goglia, 2015). These safety programs have begun to develop and strengthen the aviation safety culture in the United States. Moreover, they have helped aviation stakeholders develop and implement safety procedures and policies based on inferential data.

Federal Aviation Administration (FAA) 141 programs are yet to be required for the implementation of a SMS program. Some collegiate aviation programs have adopted voluntary SMS programs to enhance aviation safety (Adjekum, 2017; Adjekum & Fernandez Tous, 2020). The benefits of an effective SMS include reduced probability of aircraft accidents, improved employees' performance and morale, and efficient allocation of an organization's resources. Most importantly, a robust SMS can help an organization develop and maintain a healthy safety culture (Ayres et al., 2009). Therefore, the program's focus should be on resilient safety cultures. Resilient safety culture can be described as situational adaptive that implements institutional learning, and that has continuous improvements and is cost-effective (Adjekum & Fernandez Tous, 2020). The best predictor for a resilient safety culture is the emphasis on policy. Examples of situations that can deteriorate a resilient safety culture would be leadership attrition, quality of human resources, high-tempo operational activities, and national policies (Adjekum & Fernandez Tous, 2020).

Mendonca and Carney (2017) have suggested the benefits of SMS implementation in a part 141 collegiate aviation environment, and they include reduced costs resulting from safety occurrences and a robust safety culture. Some US-based collegiate aviation programs have implemented proactive safety initiatives to mitigate risks associated with training operations. With the implementation of SMS, these programs have been able to identify flight safety hazards and report these hazards through safety reporting systems that have been implemented into the program (Adjekum, 2014, 2017). Adjekum (2017) sustained that standardization and ease of access to reporting systems in

collegiate aviation programs can create a positive safety culture for organizations. Consequently, some collegiate aviation programs participate in voluntary SMS due to the positive benefits from the programs. Adjekum (2014) argued that having a positive safety culture ensures that hazards associated with the operation and errors that may occur are anticipated and mitigated.

According to Wiegmann et al. (2007), there is no universally accepted definition of safety culture. Notwithstanding, the ICAO (2013) definition of safety culture represents most of its essentials: "safety culture represents and influences the way in which safety is managed and understood in the organization, and reflects the attitudes, beliefs, perceptions and values that employees share in relation to safety" (p. 1). The five components of a positive safety culture are informing, reporting, just, flexible, and learning (Adjekum, 2014). Empirical evidence suggests that a positive safety culture is not the only determinant of safety in high-risk organizations, such as nuclear power, chemical processing, and flight training. Nonetheless, the investigation of high-profile disasters, such as the nuclear accident at Chernobyl in 1986 (Goodheart & Smith, 2014), the Columbia space shuttle explosion in 2003 (Wiegmann et al., 2007), as well as several aircraft accidents (National Transportation Safety Board, 2014, 2020) have identified a poor safety culture as a contributing factor to the accidents.

Key aviation stakeholders have indicated that a healthy safety culture is vital for aviation safety. An organization's safety culture influences and reflects how aviation safety is managed and practiced in the organization. Additionally, it "reflects the attitudes, beliefs, perceptions and values that employees share in relation to safety" (ICAO, 2013, p. 1). Therefore, enhancing an organization's safety culture is probably the most effective way to prevent aircraft accidents. A safety culture is difficult to measure (Wiegmann et al., 2007). Nonetheless, there are typical signs of a robust safety culture. For example, students in a collegiate aviation flight training environment with a strong safety culture understand the risks associated with their academic activities (i.e., flight training), know that safety is their responsibility, and are empowered to take actions to improve safety. In addition, they firmly believe that "safety does not have to come at the cost of productivity or profit" (Ayres et al., 2009, p. 93). Moreover, in a healthy safety culture people are encouraged and willing to share safety concerns even when that means divulging their own errors (Reason, 1998). This safety-related information is analyzed, right conclusions are drawn, lessons are learned, and appropriate actions (i.e., enhanced safety training) are taken to improve safety. Through training and education, they become aware of what is considered acceptable and unacceptable behaviors. Most importantly, they are provided with the knowledge, skills, and abilities to carry out their jobs safely and effectively.

Student Perception of Safety and Cultural Implications

Adjekum's (2014) findings from a survey conducted using the Collegiate Safety Culture Assessment Survey and modified using the Commercial Aviation Safety Survey showed that students involved in the collegiate program survey for a more extended period had a more positive perception of the safety culture than those who just entered the program. Another finding from the survey was that international students had a more negative perception of the safety culture than their domestic counterparts (Adjekum, 2014). Differences in culture can significantly impact the perceptions of the safety culture in a collegiate aviation program. Moreover, Adjekum (2014) in research between domestic and international students found that the international students were more likely to agree with the statement "Pilots do not bother reporting near misses or close calls, since this event does not cause any real damage" when compared to domestic students. Similarly, Dillman et al. (2011) found that international students, when discussing near-misses, do not see the value in reporting the incident due to the time, energy, and effort needed to complete the report.

Similarly, Adjekum et al. (2015) determined that negative perceptions associated with the safety culture can influence behavior and result in incidents and accidents. Many of which can lead to costly damages and loss of life. As collegiate aviation programs become more diversified with an increase of international pilots contracting for foreign airlines and government, cultural impacts can influence safety risk perceptions and reporting behaviors (Adjekum et al., 2015; Noort et al., 2016). A positive linear trend was found stating that domestic students had a more favorable perception of safety value items compared to their international counterparts. Adjekum et al. (2015) also found that when discussing safety reporting with Certificated Flight Instructors (CFI) versus those who did not hold an instructor certificate there was no correlation between the two; meaning that it did not matter whether those surveyed were a CFI or not in terms of safety reporting which can be a key indicator in the safety culture of an aviation program.

Hofstede (as cited in Noort et al., 2016) established five dimensions of national culture: power distance, collectivism, uncertainty avoidance (UA), masculinity, and long-term orientation. Using these dimensions, one can identify different cultural differences between a country's citizens. When identifying key aspects like the power distance dimension, it can impact safety culture and perception (Noort et al., 2016). For example, Liao (2015) emphasized three major elements in Chinese culture that are relevant to aviation safety: *guanxi*, high power distance, and harmony among people. *Guanxi* is a term used to describe social networking in Chinese social and business culture. It is representative of an interpersonal relationship with mutual

obligations and connections. Mutual obligations and connections can be considered flawed in aviation safety culture because they can become similar to a clique where if one is not a part of the group, others may be left out of the loop. In Noort et al. (2016), the findings support that national culture may influence safety culture. Consequently, if Hispanic/Latinx students were to avoid participation or misinterpret their current aviation safety culture, it is a behavioral problem that can pose a hazard within the aviation industry.

Methodology

Design

The researchers combined ethnographic principles with a qualitative case study structure. Ethnography is a unique research method that explores the implications of cultural meanings and interactions in a specific group of people (Creswell & Poth, 2018; Patton, 2002; Thomas, 1993). It involves studying feelings, beliefs, and meanings between a person's culture and a changing phenomenon (Barbour, 2010). Qualitative case studies enable researchers to understand and identify operational links between particular phenomena over time (Stake, 1995; Yin, 2014). By blending ethnography and case study methodologies, the researchers were able to understand how Hispanic/Latinx aviation students perceive their current aviation safety culture.

Theoretical Framework

Hofstede's (2001) theory of cultural dimensions examines the relationship between national culture and safety culture. Hofstede's (2001) theory can be impacted by a range of societal factors such as national culture, language, training, progression systems, political environment, and access to economic resources. Data derived from an organization's safety culture need to be examined as a whole from the perspective of the organization's safety culture and the national safety culture when attempting to compare safety culture data from one country to another (Hofstede, 2001; Noort et al., 2016). The analysis between safety culture and Hofstede's (2001) dimensions of national culture has been used in research to include the impact of cultural tendencies on the safety culture for an organization (Migliore, 2011). Hofstede's (2001) dimensions of national culture refer to power distance index, individualism versus collectivism, masculinity versus femininity, UA index, long-term orientation versus short-term normative orientation, and indulgence versus restraint. Noort et al. (2016) emphasized particularly UA, which is the extent to which people in society try to minimize anxiety caused by risky and ambiguous situations. In their review of safety culture history, Noort et al. (2016) found that countries with a higher UA culture may reduce the effectiveness of safety training due to the increase in focus of employees on structure scenarios than the alternative.

Now, within the context of aviation safety culture, Cooper (2000) reciprocal safety culture theory, accident causation models recognize an interactive relationship between psychological, situational, and behavioral factors to varying degrees. This relationship applies to all levels of an organization's accident causation chain. The same relationship applies to cultural change initiatives, as attempts to change people's attitudes without considering job or organizational features, to change organizational systems without regard to people's behavior or attitudes, or efforts to change people's behavior without considering the effects of organizational systems or attitudes often fail (Cooper, 2000). Therefore, safety culture change initiatives should consider the interactive relationship between psychological, behavioral, and situational factors to succeed. In the case of the present study, these safety culture change initiatives will be examined within the context of Hispanic/Latinx aviation students.

Procedures

Institutional review board (IRB) approval was sought prior to collecting the qualitative data (IRB #22-048). The researchers followed the sampling guidelines of both Thomas (1993) and Creswell and Poth (2018). The researchers identified the best participants that bear most directly on the topic (Thomas, 1993), while employing a purposeful, maximum variation sampling technique (Creswell & Poth, 2018). According to Creswell and Poth (2018), ethnographic research participant selection is a critical aspect of conducting ethnographic studies. It involves carefully choosing individuals or groups who can provide valuable insights into the research topic and help researchers understand the cultural context being studies (Creswell & Poth, 2018; Thomas, 1993). In terms of purposeful sampling, participants were selected based on their knowledge, experience, and relevance to the research focus. The researchers sought participants who could offer diverse perspectives and in-depth understanding of the cultural phenomena under investigation. Furthermore, the researchers aimed for variation and diversity in the participant selection to capture a range of experiences and perspectives within the cultural context.

The rationale for selecting Hispanic/Latinx students as the population was to understand the unique challenges underrepresented Hispanic/Latinxs face when it comes to their perception of their current aviation safety culture in their training program. The researchers were able to recruit 12 participants from a flight program located in the southeast of the United States (see Table 1). Creswell and Poth (2018) argue that a small sample size enables qualitative researchers to gather extensive detailed information from

Pseudonym	Ethnicity	Age	Flight certificate
Arthur	Hispanic	18	SP
Connor	Hispanic	19	PP/IR
Emma	Hispanic	19	PP
Ethan	Hispanic	21	CX/IR
Gabriel	Latino	18	PP
Henry	Hispanic	19	SP
Isabel	Latina	20	CX/IR
Michelle	Latina	19	CX/IR
Oliver	Hispanic	18	PP
Ryan	Latino	20	PP/IR
Stella	Hispanic	20	PP
Zachary	Latino	21	CX/IR

Note. SP, student pilot; PP, private pilot; CX, commercial pilot; IR, instrument rated.

each participant. Given the nature of ethnographic research, data collection continued until saturation was achieved. Saturation was around 10 participants, when the additional participants provided little to no new information or insight related to the phenomena under investigation (Creswell & Poth, 2018).

Data collection consisted of semi-structured interviews. Prior to commencing the interviews, participants were asked to share their preferred pronouns with the purpose of making them feel comfortable during the conversation and to later use in the findings section. The interview questions were crafted to understand how aviation safety culture affects the thinking and behaviors of Hispanic/Latinx collegiate aviation students (see Table 2).

The focus remained, as supported from the literature review, on Hispanic/Latinx aviation students' perceptions of aviation safety culture and cultural implications derived from their Hispanic/Latinx culture. All interviews took place remotely via Zoom. Interviews were audio-recorded. Audio files were transcribed utilizing the Zoom's platform transcription feature. Each transcript was then verified against the audio files and edited to ensure accuracy. Then, the transcription was sent to each participant for accuracy check (Creswell & Poth, 2018). Once each participant completed their accuracy checks, audio files were destroyed; however, transcriptions were de-identified and will be kept for a period of three years after completion of the research. Moreover, the data collected may not be used for future research studies without additional informed consent from the participants. Field observations were also conducted from June 2021 through November 2021 with the sole purpose of bringing a deeper insight of the phenomena (Rogers, 2014).

Data Analysis

The qualitative data for this ethnographic case study were derived from members who are "individuals

representatives of [a] group" (Creswell & Poth, 2018, p. 150). First, the transcribed data files were uploaded to NVivo, where the researchers were able to reduce and code the data appropriately. Then, a visual representation of the major themes and codes was developed to help the researchers understand the patterns of the culture-sharing group (Creswell & Poth, 2018) (see Figure 1). Using Hofstede's (2001) theory of cultural dimensions, the researchers explain the phenomena in question while drawing conclusions based on the themes that emerged from the data (Creswell & Poth, 2018; Rogers, 2014).

Limitations

Generalizability is one of the major limitations of any qualitative research (Creswell & Poth, 2018). The Hispanic/Latinx population of sampled students makes it difficult to generalize conclusions to other underrepresented minorities in aviation. However, the goal of an ethnographic study is to "bring data to bear on a topic, not to attack a favorite target" (Thomas, 1993, p. 63). Therefore, the researchers made every effort to establish a clear distinction between empirically based conclusions and freewheeling discussion of conjecture (Thomas, 1993). Moreover, the goal of an ethnographic study is not to "predict future behaviour but to use theory to guide the data collected" (Rogers, 2014, p. 4).

Findings and Discussion

The researchers analyzed the information collected from the interviews to formulate an understanding of how ethnographic principles align with the aviation safety culture. The unique structure of this qualitative case study allowed the researchers to understand the challenges underrepresented Hispanic/Latinx aviation students face in their routine flight training environment. Hofstede's (2001) theory of cultural dimensions was an essential tool in understanding how a national or ethnic culture plays a role in safety culture and how it is perceived by the active students of an aviation program. Factors such as individualism, masculinity, access to economic resources, and language were prevalent in the findings on how Hispanic/Latinx aviation students perceive safety culture. After further analysis of the participants' responses, the findings were divided into three themes to understand the Hispanic/Latinx aviation safety students' perception of aviation safety culture (see Table 3).

Theme 1: Typical Signs of a Safety Culture at the Collegiate Level

The first theme revealed the understanding of aviation safety culture at the students' collegiate training program. Safety culture is developed and implemented once a clear

Table 2
Standardized semi-structured interview questions.

1) Tell me about yourself.
   a) Background.
   b) How was your experience transitioning to college?
   c) Career aspirations.
2) Why did you choose to participate in this project?
3) What are some of the mental health issues, if any, for which you have sought support?
4) How would you define mental health stigma?
   a) What has your experience been when sharing (e.g., counselor, professor) your struggles with mental health?
5) Describe a healthy campus climate.
6) How has being a minority in aviation/aerospace education affected your ambitions for your future?
7) Describe any micro-aggressions that you might have experienced on campus.
8) What would you do to ensure others don't suffer from micro-aggressions?
9) What are your recommendations for improving the success rate of underrepresented minorities in completing a four-year degree in aviation/aerospace?
10) How would you define success in college?
11) What factors kept you motivated to complete your degree?
12) What social support do you feel is needed to improve students' mental health during college?

Figure 1. Visual representation of codes and themes.

vision on safety culture has been defined (Roughton et al., 2019). In order to study the perception of safety and safety culture at an institution, the researchers focused on the perspective of the students on what they define as safety culture in their respective training program. Many students believed a strong safety culture accumulated many shared benefits that emerge with a strong safety code. Henry expressed that the aviation safety culture at his training program was about maintaining the aviation institution's reputation and representing the larger aviation community.

According to the Flight Safety Foundation (2002), the possible consequences of an aircraft accident include loss of revenue, crew training and/or retraining, increased legal and insurance costs, and, most importantly, damage to the organization's reputation and thus the loss of goodwill and future customers. An abundant number of participants agreed that the reduced number of casualties and accidents was the main benefit of the aviation safety culture in their training program. Isabel best exemplified this ideal when she stated, "safety culture in aviation, they don't only apply

Table 3
Open codes and themes.

Open codes	Appearances across data sets	Category
Safety culture	20	Theme 1: Typical signs of a safety culture at the collegiate level
Safety report	19	
Professionalism	17	
Flight training	17	
Experience	7	
Reputation of institution	5	
Comradery	4	
Safety code	4	
Dedication	4	
Aviation community	3	
Proving self-worth	3	
Pilot career	3	
Safe environment	2	
Human factor	2	
Hard-working	2	
Hazardous attitude	18	Theme 2: Obstacles to a sound safety culture
Cultural expectations	15	
Challenges	13	
Risk	8	
Medication	6	
Prideful	6	
Macho	6	
Complacency	5	
Mental health	4	
Confrontation	4	
Resignation	4	
Language barrier	4	
Anti-authority	4	
Flying hungover	3	
Gender equality	3	
Intimidation	3	
Minorities	3	
Representation	2	
Sexual harassment	2	
Authority gradient	2	
Fatal accidents	2	
Communication	17	Theme 3: Methods to improve the safety culture
Integrated safety culture	16	
Aviation safety groups	14	
Safety program	11	
Encouragement	9	
Safety first	5	
Mentors	5	
Transparency	5	
Accountability	4	
Benefits	4	
Confidentiality	4	
Responsibility	4	
Anonymity	3	
Strict procedures	3	

to their pilot life, they also apply to their everyday life, and there's [sic] been occasions where it saves them from many troubles."

Aircraft accidents are rare events. Nonetheless, they provide abundant information that can be used for safety enhancements. A well-conducted investigation will "identify all immediate and underlying systemic causes of an accident and recommend appropriate safety actions aimed at avoiding the hazards or eliminating the deficiencies" (ICAO, 2000, p. 1-1-1). Furthermore, such investigations will often reveal other latent conditions not directly related to the accident but still posing a significant risk to aviation operations. Information obtained from effective safety reporting systems could provide significant insights into safety hazards and latent conditions with the potential to contribute to major safety occurrences (ICAO, 2005). Moreover, this information can help safety professionals define safety protocols to mitigate the risk associated with the identified hazards as well as to assess the effectiveness of these safety protocols.

Lastly, a large portion of students defined their perception of safety culture with the presence of strong safety reports and reporting systems, as suggested by Ayres et al. (2009). Ethan best demonstrated this concept when he emphasized the value of self-accountability in the aviation industry and the benefit of non-punishable safety reporting culture (ICAO, 2018) at his training program. A just culture is the backbone of a reporting culture (Reason, 1998). Ethan further added in his interview that safety starts with initial training, and it becomes a constant life habit that will carry long into the pilot career of these students. This particular theme of Hispanic students' perception of safety culture demonstrated the importance of a strong safety culture at an aviation training program, regardless of gender or ethnicity, as suggested by Adjekum et al. (2015).

Theme 2: Obstacles to a Sound Safety Culture

Hazardous attitudes and obstacles in aviation are applicable to any pilot from every experience and cultural background (FAA, 2016). The participants identified a number of unique factors that obstruct efficient safety culture from strengthening. Several participants identified the macho hazardous attitude as one of the most prevalent obstacles in Hispanic aviation students. Oliver and Ethan both shared their own experience of demonstrating such an attitude when flying under marginal weather conditions. Stella confirmed by stating that Hispanic students are prideful of their position and the opportunities that are given to represent a minority group. As a result, many students demonstrate the macho mentality in the training environment.

Effective communication during flight operations may be impacted by cultural, personal, and linguistic barriers. English has been the international aviation language for more than 70 years (Tiewtrakul & Fletcher, 2009). Nonetheless, investigation of high-profile accidents has suggested language barriers as contributing factors to safety occurrences (Brazilian Aeronautical Accidents Investigation and Prevention Center, 2008; National Transportation Safety Board, 2000). Due to the difference in languages spoken by Hispanic aviation students, many

participants identified the language barrier as one of the key obstacles in maintaining safety. Gabriel and Connor shared their personal experiences of miscommunication and compromises in safety caused by the simple misinterpretation of language. English is not the first language of many Hispanic students, and these participants' perception of safety culture could potentially get lost in translation.

Another factor that was unique to the Hispanic population in the aviation training program was the underrepresentation and the underlying desire for recognition (Dodd, 1989). Michelle expressed her frustration at how "minorities in aviation have to push harder to be recognized." Michele further added that minorities have a higher chance of being blamed on a larger scale, which then puts the whole community under blame for mistakes made by one particular group. According to Ayres et al. (2009), in a just safety culture errors are understood as unintentional and treated as safety lessons. Nonetheless, in a healthy safety culture there is a clear distinction between acceptable and unacceptable behaviors. Ryan expressed a similar opinion about the underrepresentation of Hispanics in the aviation community (Ison et al., 2016). Ryan believed that Hispanics have the mission of proving themselves and being a part of one of the most underrepresented groups at his institution was an inhibiting factor. Before understanding the perception of safety culture, the study needed to uncover the obstacles that hinder Hispanic aviation students in their training programs. These inhibiting factors are crucial in affecting the students' perception of safety culture as they can easily compromise safety if they are not identified and contained.

Theme 3: Methods to Improve Safety Culture

Many participants demonstrated a proactive approach in their responses on how safety culture can be better developed and implemented not just in their respective training programs but across the greater aviation community. An overwhelming number of responses requested stronger implementation of safety reporting systems (Ayres et al., 2009; ICAO, 2018). Michelle pointed out that the "students should be included and more involved in the safety reporting procedures along with their instructors." Zachary mentioned that he has "never filed a safety report on my own and I would not consider myself familiar with the system." Emma stated that many safety reports were not transparent, and students at her institution often shared rumors regarding the incidents. She believed that the training course managers and instructors were not respecting confidentiality which hindered many students from expressing their concerns. Aviation professionals could not report hazards for a number of reasons including embarrassment in front of their peers, self-incrimination in case they were responsible for the unsafe condition, and/or lack of confidence in the safety reporting system. According to

ICAO (2005), effective non-punitive safety reporting systems are based on confidentiality. Confidentiality was often brought up in the participants' responses as one of the most desired improvements in safety culture. Students demanded a safe and open atmosphere for them to share and discuss safety with a recognized figure of authority, as suggested by Reason (1998). For example, Arthur believed that "setting a positive image about safety reports with a secure structure with a [sic] chief pilot could be a good start in forming an open communication between the administration and the aviation students."

Increased exposure to safety reporting and transparency in presenting these safety reports remain crucial to the heart of safety culture (Ayres et al., 2009). Henry suggested an increase in outreach to the participating students as one of the methods for improving safety culture. He believed that "bi-weekly newsletters with accident and incident reports from the safety department could increase the trust of students and instructors. If there are no accidents, they can share current trends observed." In addition to Henry's point, Ryan added the importance of adding more safety student groups to his institution: "greater student involvement and networking between the administration and the rest of the training program could develop a clear line of communication that is solely focused on improving safety culture." As many participants have expressed in this study, Michelle's closing comment left an impression when she stated,

> Improving safety culture is to speak out and have a conversation which is the first layer to adding more safety. It should not be confronting but should be more like having everyone's back in the aviation community and looking out for each other.

For these Hispanic/Latinx aviation students and their perception of safety culture, there is plenty of room for growth. The drive to improve safety is strong, and the participants understand the importance of mutual effort and inclusivity. Many of these suggested methods to improve safety can be beneficial to the aviation community and training programs across the country.

Conclusion and Recommendations

According to Boeing (2022a), the in-service fleet in the next 20 years will increase from approximately 26,000 aircraft in 2019 to 47,100 in 2041. The need for qualified aviation professionals will remain strong as more that 610,000 new pilots, 600,000 new maintenance technicians, and almost a million new cabin crew members will be needed in 2041 to ensure efficient, safe, and sustainable aviation operations worldwide. Therefore, "effective training and an adequate supply of personnel remain critical to maintaining the health, safety, and prosperity of the

aviation ecosystem" (Boeing, 2022b, para 1). This is one of the key factors leading to the steady growth of professional flight programs nationwide (Mendonca et al., 2021).

Previous studies have indicated the benefits of safe aviation operations, including the reduced risk of aircraft accidents, potential reduced insurance costs, more business opportunities and competitive advantage (Ayres et al., 2009), compliance with regulatory requirements and standards, and improved productivity (Mendonca & Carney, 2017). Most activities performed by professional flight schools involve a number of hazards (e.g., language barriers during communications) and a certain level of risk. An effective safety culture creates an environment that is conducive to the achievement of an organization's business and safety objectives. Most importantly, it helps aviation students develop the knowledge, skills, and abilities to carry out their academic activities safely and efficiently.

The study aimed to understand the perception of safety culture by Hispanic aviation students, in which the result from the qualitative data collection revealed three themes as the typical signs of safety culture at the collegiate level, obstacles to a sound safety culture, and methods to improve the safety culture. Analyzing an already developed safety culture at an aviation training program required the researchers to understand the current status of safety culture and identify the unique cultural obstacles that a specific ethnic group of students experienced. These obstacles and their perception of safety culture can be subjective, but it provides an insight into the unique perspective of these Hispanic aviation students. In addition, the suggested methods for improving safety culture were unique to the institution and there is no overnight resolution which will drastically improve safety in aviation. Many participants shared the common goal of maintaining safety in their everyday operations and the desire to improve safety is only a positive message for the future of aviation. Safety culture is warmly accepted by these Hispanic/Latinx aviation students and the unique situation of adapting a safe lifestyle in and out of the cockpit is an admirable trait that many students demonstrated in their responses.

The study conducted semi-structured interviews with students who are currently part of a flight training program to explore their perception of safety culture. The research focused on Hofstede's theory of cultural dimensions which allowed the researchers to identify factors that influence the perception of safety culture by a specific ethnic group. The study was conducted as a qualitative case study with ethnographic principles in order to examine a specific ethnic group's perspective. The themes that emerged from the study provided a better understanding of how Hispanic/Latinx aviation students perceived the safety culture in their aviation program. As the emphasis on improving safety increases across the industry, collegiate aviation training programs should continue to thoroughly assess their safety

education and implementation in order to cultivate a strong safety culture.

The importance of safety in the aviation community has always been the priority in creating a safer air travel environment across the globe. For the Hispanic/Latinx aviation students, the issue at hand is no less important than for any other ethnic groups striving to achieve the same goal. Future studies can explore the perception of different ethnic groups of students at various geographical locations that introduce an added layer of threat and safety compromises. In addition, similar research can be carried out to study different perspectives of students in other industries outside of aviation as safety is a shared interest of the public. Moreover, some of the recommendations proposed by the participants that can be adopted across all industries are: (1) promote and create a welcoming environment in which students can share and express unique safety concerns and experiences, (2) facilitate student safety groups and increase community outreach to better promote the importance of safety culture, and (3) improve the representation of minority groups in aviation training programs as well as the administrative positions in respective safety departments and organizations.

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