**EXPLORING HANGAR FLYING AS A COMMUNICATION PRACTICE FOR VICARIOUS LEARNING: A QUALITATIVE CONTENT ANALYSIS OF GENERAL AVIATION STORYTELLING ON YOUTUBE**

by

Timothy Aaron Frizzell

Liberty University

A Dissertation Presented in Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy in Communication

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## Abstract

More than 50% of general aviation accidents are caused by pilot error, often due to inadequate formal training or inexperience in real-life situations (Pilot Institute, 2023). Some scholars suggest that learning from other pilots' experiences could supplement formal training and increase general aviation safety (Cohn, 1994; Harnagel, 2021; Krog, 2022). With this in mind, this study explored the communication phenomenon known as *hangar flying,* an aviation storytelling practice in which pilots share flying experiences. The goal was to investigate how hangar flying may enable vicarious learning, influence personal flying culture, and, as a result, increase flight safety. Employing a qualitative digital content analysis approach, 110 YouTube videos containing general aviation hangar flying stories were examined, revealing primary content themes of safety education, risk, and lifelong learning, as well as multiple vicarious learning examples within the viewer comments. Additionally, parasocial relationships were found between the viewer and storyteller, which may act as an accelerant to vicarious learning and influence the pilot's future flying behaviors. Findings also showed strong connections between social learning, social cognitive, narrative, and cultivation theories as means for socially constructing a pilot's unique view of flying. When pilots engage with high-quality narratives, they can vicariously learn from them and choose how to act upon that learning, ultimately determining the kind of pilot they become. This study is valuable for pilots, instructors, and general aviation leaders as it strongly indicates that hangar flying is an impactful communication-centric tool that may enable vicarious learning and enhance flight safety.

　　　*Keywords*: hangar flying, communication, general aviation, pilot, digital storytelling, vicarious learning, personal flying culture, content analysis, flight safety, YouTube, social learning

**Copyright Page**

**Dedication**

This dissertation is dedicated to my wife, Charity, and our four children, Abigail, Claire, Samuel, and Emma. Your support has seen me through the long days at the computer, creating this massive document. You have given so much to me, and this work belongs to all of you.

Charity, your love and support of my goals and aspirations are nothing short of amazing. Whether it was learning to fly airplanes, renovate houses, or pursue this Ph.D., you have been beside me, encouraging me consistently. Even though my natural pessimism often spoke of the gloom and doom of this doctoral journey, your sunny optimism drove all the clouds away and reassured me that God was in control and would lead and guide me through it all, which He did. You genuinely love me despite all my weaknesses, and I am blessed that the Lord brought us together. I appreciate your help in sorting out my ideas, narrowing my focus, and proofreading my papers. You gifted me countless hours as I droned on about various research directions, methodologies, hangar flying stories, and interesting YouTube videos. You were the best research assistant I could have asked for. Thank you for being my helpmate. I love you.

Abigail, Claire, Samuel, and Emma, thank you for tolerating me for the last few years. You have loved me anyway, despite me being a prisoner in my office at times. You all showed your support by getting along with each other on those days when Mom was working and I was writing. You brought me coffee and snacks and wrote encouraging words on my office whiteboard. I loved that! You have given me a great gift during this journey, and that is the gift of understanding. Although unfair to you sometimes, you have understood when I needed to work and loved me through it. I am grateful God has blessed my life with yours, and I consider it an honor to be your Dad. However, I will force you to call me Dr. Dad for a while. From the smallest to the tallest, I love you all.

**Acknowledgments**

This doctoral journey has shared many similarities to my flight training. Both have required long hours of study, have tested my patience and skill levels, and pushed me beyond my comfort zone often. Flight training requires a disciplined mind and persistence to complete the mission while maintaining your safety and that of your passengers. Just like flying, writing this dissertation has required preparation, attention to detail, and a systematic approach. Like achieving my pilot's license, finishing this degree was not easy. Nothing worth doing ever is. I believe I became a better version of myself when I learned to fly an airplane, and I believe this doctoral experience has also brought me to a new level of personal growth. That said, I did not complete this journey alone, nor would I have made it this far. Thus, many deserve my thanks.

First, thanks be to my Lord and Savior, Jesus Christ, who, despite my shortcomings and whining prayers about returning to school at 41 years old, loved me and drew me close to Him throughout the process. Undoubtedly, the Lord led me to Liberty University and into the care of fantastic mentors and friends. For his lovingkindness, Lordship, and sacrifice on my behalf, I will never cease to praise Him.

To my family, I thank you all for your love, patience, and support these last few years. When I started this journey, I had no idea how much time and attention it would take away from you all. Thank you for sticking by me.

To Dr. Hartley, I will be forever grateful for your prayers, encouragement, and kindness. Your Godly mentorship and guidance have been blessings to me. Early in my coursework, I called Dr. Mott to learn more about the dissertation process. When I told him the topic I was considering involved aviation, he immediately recommended that I seek you out as my committee chairperson. I knew the Lord had led me to Liberty because He provided me with a chairperson who loved aviation, just like me. Since then, I have enjoyed our hangar flying

conversations, whether about the research or more important things like airplanes. You have truly blessed my life, and I am so thankful for your Christ-like example and leadership. Even on those days I resisted your encouragement, I was grateful for your care and friendship. Again, thank you for pushing me, consoling me, and helping me. I feel that I have grown as a person and a scholar, and I partly owe this growth to you. It has been an honor to know you, and I pray we have the chance to fly together someday.

To Dr. Mott and Dr. Hepburn, I have appreciated your insights and guidance throughout this journey. Although my interactions with you have been limited, I have been blessed to have you alongside me. Dr. Mott, thank you for encouraging me to pursue the hangar flying topic, which allowed me to focus my doctoral studies on two things I enjoy: aviation and communication. This choice made the journey so much more fun! I am also thankful that you love airplanes, too. Dr. Hepburn, I always appreciated your kindness and encouraging feedback. I know you are not an aviation geek like the rest of us, but your honesty and insight into my initial writing process were constructive. Thank you both for serving on my committee, reading this document, and helping me to grow beyond this degree.

Special thanks go to the newly credentialed Dr. Kailey Spilger, who ran this dissertation race with me. I have been very thankful for your encouragement and kind words these last several months. Whether those were in our discussion posts or on Facebook, you have been a safe place to share struggles along the way. Thank you for being the light of Christ. Although we have not met in person, I consider you a dear friend, and I am glad we did this together.

Thanks to another special friend, Zoe Montoya, who journeyed with me during the coursework phase of this program. We had several classes together, and even though we did not finish this together, you played a significant part in this achievement. I was so thankful I had you

to talk to about our classes, papers, and, sometimes, teachers. You were a solid rock I could

count on, and I will be forever grateful for your friendship. I believe God wove our paths

together for a reason, and I hope to hang out with you, Estevan, and Rufus one day.

   To all those I have met in the multiple Liberty Facebook Groups, thank you for your

support and cheerleading throughout my journey. I have treasured the advice and insights that I

have received from other students and newly minted doctors in the groups. The social support

shown during my doctoral journey has been impactful for me. Thank you all.

   I also thank all the pilots with whom I have had the pleasure of hangar flying over the

years. The laughter, learning, and friendship brought about by sharing stories have enhanced my

life and my flying. I am a wiser pilot and person because of what I have learned from other

aviators. I thank you and your stories for inspiring this research study. I wish you all blue skies

and tailwinds.

   Finally, thank you for reading my dissertation about hangar flying. Although you may

have doubts about this being groundbreaking research, I want you to know that I believe

everything comes from God, including stories, learning, and airplanes. Further, I think that God

created each of us and allows us the choice to learn, understand, and change our behaviors. God

also guides our steps and places others in our lives to learn from and build relationships with.

While hangar flying stories might seem random or told only to amuse, I see a greater God-given

purpose in them. Those communication encounters happen for a reason, one that God has control

over. The knowledge exchanged, or the future behavior change is all part of His larger plan and

narrative. These beliefs guided my research concerning the use of stories in aviation, and I pray

you will find value in this study.

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## List of Abbreviations

Air Safety Institute (ASI)

Air Traffic Control (ATC)

Aircraft Owners and Pilots Association (AOPA)

Airline Transport Pilot (ATP)

Certificated Flight Instructor (CFI)

Code of Federal Regulations (CFR)

Experimental Aircraft Association (EAA)

Federal Aviation Administration (FAA)

Fixed Base Operator (FBO)

Instrument Flight Rules (IFR)

Instrument Meteorological Conditions (IMC)

National Transportation Safety Board (NTSB)

Private Pilot License (PPL)

Social Cognitive Theory (SCT)

Visual Flight Rules (VFR)

Visual Meteorological Conditions (VMC)

**PROLOGUE**

There I was, flying along my little four-seat Cessna 172 when suddenly, two F-16 military jets appeared on each side of my airplane. This is the end, I thought. Tomorrow's headline would read, "Student Pilot Shot Down Over Kentucky." I was terrified.

It had been a beautiful day with hardly a cloud in the sky. I was flying solo as a student pilot on a short cross-country flight to an airport about 50 miles from my home base. The flight south to the destination airport was slow and uneventful with no other airplanes in the sky with me. I then left that airport and climbed to an altitude of 5,500 feet. I was in control of the aircraft without an instructor telling me what to do. I truly felt like the pilot in command and was enjoying the flight home. That is when they showed up, one on my right and one on my left, creating this F-16 sandwich with me as the meat. I was not having fun anymore.

I had to pinch myself to make sure this was not a dream. What was happening? Did I violate some special air space? Was the president in town? Were they here to escort me away or shoot me down? The bead of sweat that had formed on my brow was now a fully developed stream running down my face. I started to panic as I ran through the possible outcomes of this encounter. I thought that I should try contacting them on the radio. Just as I prepared to say something, they sped away, leaving me confused, shaken, and needing a restroom.

I later discovered I had crossed a military training route, a special path in the sky where military aircraft can operate at low altitudes and any speed. Usually, this was not a big deal, as I rarely saw military aircraft on those routes. My flight was not illegal, but I had neglected the possibility of military air traffic along the path when mapping out my trip the previous day. I had failed to prepare, which could have led to a dangerous situation. The lesson I learned was that proper planning can prevent panic! I hope others can learn from this story and my mistakes.

## CHAPTER 1: INTRODUCTION

### Overview

Although the story in the prologue may sound like a tall tale, it is true and happened during the author's flight training days. The story is an example of a communication practice within aviation called *hangar flying*, and it is likely as old as the first flight made by humans. It has been the researcher's experience that pilots love to gather with each other and tell stories of their flying adventures, some with excellent historical accuracy, others with some embellishment. This act can be educational, entertaining, and influential for pilots. Pilots also choose what stories to give their attention to and how those stories shape their future flying. This storytelling practice within the aviation community is integral to its culture, safety, and future, yet it has not been explored much within aviation or communication scholarship.

Aviation storytelling, known as *hangar flying*, has been shown to have the potential to impart knowledge and skill to aviators (Harrison, 2021; Kruschwitz & Roth, 1999; Vandenputte, 2021) but has yet to receive much attention in scholarly literature. First, storytelling of any kind is a communication practice that has been used for generations to pass down history, cultural traditions, and beliefs and as a tool for teaching knowledge and skills (Clair et al., 2014; Cleverley-Thompson, 2018; Hoffman-Bergholm, 2023; Landrum et al., 2019; Wiessner, 2014). Additionally, several studies have shown the act of storytelling to be an effective tool for learning in various fields, including education, business, healthcare, information technology, and social media (Austin et al., 2016; Gallo, 2019; Humpherys & Babb, 2020; Landrum et al., 2019; Sharf et al., 2011; Zazkis & Liljedahl, 2009). Fisher's (1984) narrative theory also claimed that stories were how people constructed and understood their world. Hangar flying may be a way for pilots to use stories to build their personal flying cultures and better understand the world of

aviation. Stories like the one at the beginning of this chapter may help them learn new skills,

increase safety, or possibly lead them to risky behaviors. Storytelling may be one of the oldest

forms of human communication (Ong, 1982/2002), and has evolved from face-to-face

interactions to embrace emerging technologies. Today, online digital storytelling has created a

new way of sharing experiences and teaching lessons through video, images, audio, and social

media. Hangar flying has also evolved from a story shared around a table to online communities

of individuals from around the world. With a focus on this evolving storytelling communication,

this research study explored the communicative impact of hangar flying on general aviation

pilots as it relates to their continuing flight education and personal flying culture. The study

investigated the topic by examining online hangar flying stories shared by real general aviation

pilots in videos posted on YouTube.

The problems addressed in the study are twofold. First, few studies have explored hangar

flying as a communication practice for vicarious learning in the broad development of general

aviation pilots' personal flying culture. While other studies have investigated the use of

storytelling in various disciplines, from psychology to information technology (Austin et al.,

2016; Landrum et al., 2019), hangar flying has only been briefly discussed in the non-scholarly

realm of magazine articles, blogs, and social media (Harrison, 2021; Vandenputte, 2021).

Second, the formal training that most general aviation pilots receive is deficient in preparing

them for real-life scenarios or problems they may encounter during their operation of an aircraft.

Unfortunately, these deficiencies can lead to increased accident rates and fatal injuries,

suggesting a need for a different kind of educational method. Engaging in hangar flying is a way

for pilots to learn from the errors of others without risk to themselves and potentially prevent

their own injury or death. This study addressed the problems by exploring hangar flying's origin,

evolution, use as an informal learning tool, and contribution to developing general aviation pilots' personal flying cultures. The goals were to foster a better understanding of the impact of this communication phenomenon on the general aviation community, pilot education, and safety, and to establish some baseline scholarly research on the topic.

This study used qualitative methods and an emergent design to explore the communication phenomenon known as hangar flying. Qualitative research cannot be tightly prescribed, which allows for new ideas or concepts to emerge during the study and grants the flexibility to explore these various paths (Creswell & Creswell, 2018).

Hangar flying has progressed from face-to-face encounters at the local airport to online interactions. Because of this evolution, the study utilized a qualitative digital content analysis approach focused on 110 selected online videos depicting general aviation hangar flying stories, which were analyzed and coded for emerging and common themes. The core element of the videos was that they featured a hangar flying story that taught a lesson or shared an experience related to general aviation, which was told by a general aviation pilot. The videos were curated and deemed appropriate for the study by the researcher, who is a certificated private pilot and familiar with hangar flying content. The selected videos had at least 1,000 views and 1,000 subscribers and showed viewer comments below the video. Content deemed purpose-built, as well as user-generated content, was collected. Originally, approximately 75–100 artifacts were the target sample size. However, data collection continued beyond the target, reaching data saturation with 110 videos. Saturation occurs when no new data or themes emerge (Charmaz, 2006). As a secondary data source, the viewer comments for each video were explored for common themes, indications of vicarious learning, and general perceptions of hangar flying story content.

The video samples were selected through purposive sampling, primarily through the YouTube video-sharing platform. Transcriptions of the videos and viewer comments were analyzed using thematic analysis to identify emerging themes related to the viewers'—who are likely general aviation pilots—perceptions of hangar flying.

Chapter 1 includes background concerning general aviation and storytelling, an overview of the theoretical underpinnings of the study, as well as the problem statement, purpose, significance of the study, research questions, definitions, and summary.

## Background

Since this research focuses on communication and aviation, some background information and explanations are necessary to understand the role of hangar flying as a communication method that can impart knowledge and shape a general aviation pilot's personal flying culture.

### Categories of Civil Aviation Operations in the United States

Civil aviation (non-military) operations in the United States are regulated by the Federal Aviation Administration and are separated into the following three broad categories: commercial airlines, non-scheduled air carriers, and general aviation. Different flight rules regulate each category, otherwise known as the Code of Federal Regulations (CFR), which is segmented into various parts. These three categories of aviation are regulated under Part 121, Part 135, and Part 91, respectively. Commercial airlines like Delta or Southwest operate under Part 121 and have scheduled air transportation services carrying passengers, while air carrier services under Part 135 involve non-scheduled charter, air taxi, and corporate flight operations. General aviation, operating under Part 91, encompasses all civilian aviation operations besides commercial airlines and consists of small, often single-engine aircraft for business or personal use (International Civil

Aviation Organization, 2009). A single-engine aircraft is powered by one engine and often

carries six or fewer passengers. This category can include fixed-wing (airplanes) and rotorcraft

(helicopters); however, this research focused on fixed-wing general aviation aircraft and the

pilots that fly them. The pilots primarily flying in general aviation hold Private Pilot Certificates,

although individuals can have other certificates and ratings and still operate general aviation

aircraft. In the United States alone, there are over 200,000 registered general aviation aircraft and

approximately 500,000 pilots that could operate within general aviation (Federal Aviation

Administration, 2023). More than 90% of civil aircraft registered in the United States are general

aviation aircraft, and more than 80% of certificated pilots in the United States fly general

aviation aircraft (Aircraft Owners & Pilots Association, n.d.-a). This research study primarily

focused on the general aviation category operating under Part 91 rules and, more specifically, on

the general aviation pilot.

**General Aviation Pilot Training**

General aviation, as well as the overall aviation industry in the United States, relies on a

system of experiential education to build piloting skills, pass examinations, and earn pilot

certificates (Kearns & Sutton, 2013). This education comes in the form of some textbook reading

but mostly hands-on practice in an aircraft. The assumption is that over the course of the

minimum time required for a pilot to earn a certificate, they will have been naturally exposed to

enough scenarios to build their skills sufficiently (Kearns & Sutton, 2013). However, more than

time may be needed to create proficiency and confidence.

Besides building the necessary skills to fly an airplane successfully, much aviation

education and training seems centered on avoiding death, injury, and property damage. For

example, there are entire organizations focused on the subject of aviation safety education, like

the Air Safety Institute, Flight Safety Foundation, Flight Safety International, the Aviation Safety

arm of the Federal Aviation Administration (FAA), and the Office of Aviation Safety within the

National Transportation Safety Board (NTSB) to name a few. Each of these organizations creates

safety education content in various forms, much of it online in blogs, videos, and podcasts. It is

not a secret that flying airplanes can be dangerous, and the reason for focusing on safety is that

there is a high rate of accidents, especially in general aviation. In 2021, the NTSB reported 1,156

general aviation accidents, 210 of which resulted in fatal injuries to 344 individuals. It has also

been determined that over half of all general aviation accidents are caused by pilot error due to

inadequate or improper training and a lack of experience (Pilot Institute, 2023). The accident

reports often mention a pilot's lack of training or experience as a cause, even though the pilot

received the minimum training to operate the aircraft legally. This fact suggests that pilots need

more knowledge beyond formal training to lower the accident rate.

Major et al. (2017) found that many weather-related accidents were caused by

deficiencies in pilot training and a lack of experience. In a national survey, Major et al. found

that many pilots reported that they received enough training to pass the checkride, the test needed

to become a pilot, but admitted that their overall flight education was lacking in some areas,

especially real-world weather situations. The pilots also revealed that they do not receive

ongoing training after earning their pilot certificate. Another example is provided by Boyd

(2023), who also illustrated deficiencies in general aviation formal education regarding flying in

potentially hazardous flight conditions and suggested more demanding and frequent training or

recurrency for all general aviation pilots. Kearns and Sutton (2013) discovered that many pilots

reported low confidence in their non-technical skills like communication or situational

awareness. They felt that more experience and education would benefit their future piloting endeavors.

Most general aviation pilots are not professionally employed to fly aircraft and do so more for recreation or business. Thus, the formal training requirements are less stringent than those for professional airline pilots. A common misconception among non-aviators is that pilots earn licenses to fly as one earns a license to drive various types of vehicles, but this comparison is inaccurate. For example, to drive a car, an individual must be 16 years of age and pass a written and driving test. If someone wishes to drive a motorcycle, there is a test and license for that vehicle. Obtaining a license to drive a tractor-trailer entails more training and testing, as does driving a tractor-trailer that hauls hazardous materials. All of these vehicles require special testing and licensing. Aviation follows a similar testing pattern as one learns to fly bigger, more complex aircraft. However, in aviation, pilots earn certificates and ratings, not licenses, for each level they attain.

**Pilot Certifications**

The Code of Federal Regulations (CFR) lists several levels of pilot certificates in order of the requirements needed to obtain them. The certifications are student pilot, sport pilot, recreational pilot, private pilot, commercial pilot, and airline transport pilot (Certificates and Ratings Issued Under This Part, 14 CFR § 61.5, 2023). However, for this research, the following will describe three of the more significant certifications so that the reader has context and information to understand the various types of pilots mentioned in the study. One should note that while commercial and airline transport pilots are often engaged in professional operations outside general aviation, they may still fly general aviation aircraft recreationally or simply maintain those levels of certification for personal reasons. Two examples in this study are

Missionary Bush Pilot (n.d.) and steveo1kinevo (n.d.), who hold commercial certificates but share their experiences flying single pilot operations on YouTube, which are valuable for general aviation pilots.

### *Private Pilot*

Most aspiring pilots begin by attaining their private pilot certificate, which allows them to fly single-engine aircraft weighing less than 12,500 pounds in good weather conditions. A person must be at least 17 years old, have logged at least 40 hours of flight time, and pass written, oral, and flight exams to be eligible to receive a private pilot certificate (Subpart E–Private Pilots, 14 CFR § 61, 2023). There are approximately 164,000 individuals with private pilot certificates in the United States (Federal Aviation Administration, 2022). Private pilots may add an instrument rating to their certificates, allowing them to fly in poor weather conditions or in the clouds while piloting only by reference to the instrumentation in the aircraft. Private pilots may also attain ratings or endorsements that allow them to operate aircraft with more than one engine, retractable landing gear, more powerful engines, or aircraft that can operate on water. All of these require the pilot to acquire knowledge and be tested.

### *Commercial Pilot*

After obtaining a private pilot certificate, the next certification is the commercial pilot certificate. This certificate allows pilots to receive compensation for their flying and is the next step toward flying professionally. These pilots operate more powerful and complex aircraft and must gain a higher level of precision and aviation knowledge. Individuals must be at least 18 years of age, have a minimum of 250 hours, and pass written, oral, and flight exams to be eligible to receive the commercial pilot certificate (Subpart F–Commercial Pilots, 14 CFR § 61, 2023). Currently, the United States has approximately 104,500 commercial pilot certificate

holders (Federal Aviation Administration, 2022). As mentioned, many commercially rated pilots still fly general aviation aircraft.

### Airline Transport Pilot

Airline transport pilots (ATP) are certificated to fly the *big iron*, also known as commercial airliners, like the Boeing 747 or 777. These individuals have earned their private and commercial certificates as well as multi-engine and instrument ratings to be eligible to earn their airline transport pilot certificate. Individuals must be at least 23 years of age, have amassed at least 1,500 flight hours, and pass written, oral, and flight exams to be eligible to fly commercial airliners (Subpart G–Airline Transport Pilots, 14 CFR § 61, 2023). While individuals with ATP certificates do not often operate within general aviation, they are mentioned here to contrast with the requirements of the private pilot, which, as noted previously, composes the largest group operating in general aviation (Federal Aviation Administration, 2022).

### Ongoing Training and Other Requirements

Pilot certificates must also be maintained or kept current with periodic evaluations by a certificated flight instructor; however, general aviation and professional airline pilots do not have the same requirements. In professional aviation, airline pilots must participate in recurrent training every 6 to 9 months, which is more frequent than general aviation pilots (Hoke, 2018). This training may take several days and require flying with an instructor, logging a set number of hours in a flight simulator, and classroom reviews. General aviation pilots are only required to pass a flight review with a flight instructor every 24 calendar months, which consists of 1 hr of ground instruction and 1 hr of flight instruction (Subpart A–Flight Review, 14 CFR § 61.56, 2023). A successful flight review keeps the general aviation pilot "current" or legally allowed to operate an aircraft. Additional currency requirements include completing three takeoffs and

landings every 90 days to legally carry passengers for private pilots and six instrument

approaches every six months for instrument-rated private pilots to exercise the privileges of the

instrument rating (Recent Flight Experience: Pilot in Command, 14 CFR § 61.57, 2023).

Ongoing training is not required for general aviation pilots.

Additionally, general aviation pilots must be certified by a physician or aviation medical

examiner as medically fit to fly based on the requirements listed in the Code of Federal

Regulations (CFR) and the level of pilot certification they hold or pilot privileges they choose to

exercise (Medical Standards & Certifications, 14 CFR Part 67, 2023). For example, a third-class

medical certificate is appropriate for those exercising the rights and privileges of a private pilot

certificate in general aviation, while a first-class medical certificate is required of airline pilots

(Stack, 2020). Medical certificates must be renewed at regular intervals depending on the level of

pilot certification one holds and the age of the pilot, and one must be certified as fit to fly by an

aviation medical examiner (Medical Certificates: Requirement and Duration, 14 CFR § 61.23,

2023).

**Why Focus on General Aviation?**

Since childhood, the researcher has longed to "slip the surly bonds of earth" and dance on

the skies (Magee, 1941, line 1). These words were penned by pilot and poet John Gillespie

Magee Jr. in a letter to his parents during his service in World War II. These words inspired a

younger version of the researcher to look skyward and fueled his desire to fly. After many ups

and downs—pun intended, the researcher earned his private pilot certificate at age 30. During his

training and other attempts that failed to take off, he learned the value of hangar flying sessions.

Listening to the stories of pilots, mechanics, instructors, other students, and occasionally just an

enthusiastic non-aviator was the best part of his flying education. Even more than face-to-face

interactions, the researcher consumed and continues to consume digital hangar flying stories found in online blogs, articles, podcasts, and videos. The availability and convenience of these online aviation stories helped him learn informally while training formally and continued to aid him in his piloting journey. Although he has never pursued a formal career in aviation, these stories made the journey to the researcher's private pilot certificate more enjoyable, and he feels he arrived at his destination wiser because of them. General aviation is where the individuals who fly for the fun of it are, and the researcher loves those people. The author is interested in how these hangar flying stories teach and shape individuals into the pilots they become, for good or ill. The author is also a communication educator with nearly 20 years in the community college system. Although his subject is not aviation, the researcher is very interested in how individuals learn through the communication practice of storytelling, whether in traditional or online modalities. This research study blends the author's interest in communication studies and his passion for aviation in an exploration of hangar flying. Though an ancient form of communication, stories like those told in hangar flying sessions are potent influencers on attitudes and behaviors.

**Storytelling**

Since the earliest days of humanity, people have listened to and told stories, often sharing their daily adventures around a campfire and passing down their knowledge to the next generation (Gallo, 2019). Stories were used to entertain, inspire, and even educate those who listened. Anthropology professor Polly Wiessner (2014), whose research focused on the narrative storytelling practices of early humans, concluded that "through stories and discussions, people collected experiences of others and accumulated knowledge of options that others had tried" (p. 14030). Many scholars, ranging from ancient philosophers like Aristotle to more modern-day

researchers like Kenneth Burke and Walter Fisher, have studied and concluded that narratives are the primary way human beings understand the world around them. Whether employed orally, textually, or via digital modalities such as social media platforms like YouTube or Instagram, storytelling remains an ever-present form of human communication to share information and connect with others (Clair et al., 2014; Fischer et al., 2020; Musfira et al., 2022; Yeh & Mitric, 2019; Zammit et al., 2016).

Storytelling is also a form of indirect communication whereby information is transmitted implicitly rather than explicitly (Fraser, 2020). Direct forms of communication convey information via logic and reason, while indirect approaches favor narrative, allegory, and symbolic interaction. An example of direct communication is telling someone to "shut the door," while alternatively saying that "it is loud in the hallway, and I am having trouble hearing you" communicates indirectly that an action should be taken. The parables of Jesus Christ are examples of indirect communication that also taught lessons. These parables were allegorical stories, usually with imagery, which are believed to have been designed to aid those listening with remembering and retaining the information (Chia, 2020). By using simple visualizations of information that most people could recognize, complex spiritual teachings could be made easier to grasp, thus helping people understand Jesus' teachings and choose to follow Him.

Today, stories are still told as Jesus did, although the modalities have changed. Today, one can tell a story in a traditional face-to-face method, post it online, or create a video to share it or record it on a podcast. New forms of digital storytelling use images, audio, and video to convey story messages to others (Chan & Sage, 2019). Choi (2018) added that digital storytelling could include entertainment value, enhance learning in educational environments, and increase listeners' engagement in shared information. Further, Choi suggested that some YouTube videos

can be used to educate and simplify concepts and messages to increase engagement and learning in the listener.

Whether in video, audio, or parable form, storytelling can be a valuable way to impart knowledge. A well-told story often has more impact and can illustrate a complex concept more effectively than a textbook can. Landrum et al. (2019) suggested that storytelling is an essential educational and pedagogical tool, often creating better student connections than traditional lectures. Landrum and colleagues discussed how learning from stories helped children and adults better understand themselves and the topic of study. Listeners are effectively transported into the story and see themselves within it, which allows them to learn without ever having to experience what the storyteller recounts. In this way, storytelling becomes a form of indirect communication, enabling what psychologist Albert Bandura (1977) called *vicarious learning*.

**Vicarious Learning**

Vicarious learning is a central element of Albert Bandura's (1977) social learning theory, which posits that individuals learn behaviors and knowledge through observing others' actions and communication. For example, individuals can watch another person touch a hot stove and learn that burns and pain result from this action and that it is best to avoid this behavior themselves. While the observers were not burned, they learned vicariously through the actions of the other. Vicarious learning is based on observational learning, which is learning through watching and listening to others (Rymanowicz, 2015). Similarly, the communication act of storytelling may also enable vicarious learning through hearing stories. People may learn and alter their future behaviors to avoid or achieve the results of the story told. Bandura (2006) wrote that storytelling had excellent teaching and learning power, especially in enabling personal and social change, and is often more effective when the story's message is communicated indirectly.

More specific to this study, Myers (2022) qualitatively explored the use of storytelling for vicarious learning amongst flight crews in an air medical transport team, revealing the value of this communication tool for gaining knowledge and skill through sharing experiences. In addition to oral and textual-based storytelling, research has also been conducted illustrating the use of digital modalities such as YouTube videos to enable vicarious learning among students (Choi, 2018; Choo et al., 2020; Nair & Yunus, 2021). Related to the current research study, Sellberg et al. (2021) investigated how educators could curate YouTube videos to teach situational awareness and crew resource management for pilots, finding that there was value in the videos if the content was selected well. Fussell and Thomas (2021) found strong evidence to suggest that interactive learning via video and other online forms could enhance the education of flight students, especially those considered digital natives in Generation Z.

Interestingly, the Federal Aviation Administration (FAA) created a system called *scenario-based training* that uses real-world experiences or stories as the basis for training exercises (FAA, 2007). The training is meant to teach piloting skills similar to situations the pilots may encounter while exercising their flying privileges without being in those actual situations. While the FAA does not mention the term *vicarious learning* in its descriptions of scenario-based training, it seems that this system meets the criteria. Others have suggested that stories of flying experiences might be sources for mental practice exercises in scenarios one might complete in an aircraft (Jentsch et al., 1997).

Vicarious learning and storytelling have been applied positively to many other disciplines (Choi, 2018; Landrum et al., 2019). However, few scholarly studies focus on storytelling in aviation or the indirect effects these *hangar flying* stories may have on general aviation pilots and their flying culture.

**Hangar Flying**

Informal conversations containing subject matter specific to an occupation or area of interest are often called *shoptalk* (Merriam-Webster, n.d.-a). Those who enjoy cars or motorcycles call this practice *bench racing* (Benty, 2017). Other versions may be called *water cooler chats* or *hair salon gossip*. (Eisenhauer, 2020; Hill, 2002). Within the general aviation community, pilots often share stories about airplanes, flights, mistakes, and even emergencies they have encountered in a similar act called *hangar flying* (Vandenputte, 2021). These story sessions are often very entertaining but also very educational, filling gaps in training and further adding to the skill levels of pilots (Harrison, 2021). The author's hangar flying story at the beginning of the chapter contains elements of education and entertainment, and while seeming a bit fantastic, it was a true story. This researcher speculates that the communication practice most likely began with Orville Wright running up to his brother, Wilbur, saying, "You'll never believe what I did a few minutes ago!" While the origin of the term has not been officially determined, it has been speculated that whenever there was bad weather and pilots could not fly, they would sit around the hangar, drink coffee, and swap stories until the weather cleared (Huss, 1999). Another description of the term is the "reliving and retelling of past moments in the cockpit while surrounded by other pilots and aviation addicts waiting their turn to do the same" (Emblem, para. 2, 1975). Although the term may have originally referred to sharing flying experiences while sitting or standing in an aircraft hangar, the act is not limited to a specific setting. Hangar flying can occur in person, in print, or online through social media, articles, videos, and podcasts. Social media and video sharing offer the opportunity for interaction between those who create the content and those who consume it through replies, likes, and comments (Bayer et al., 2020).

Regardless of modality, Harrison (2021) and Vandenputte (2021) concluded that hangar flying was an invaluable learning experience for all pilots of any skill level.

Vandenputte (2021) claimed that learning from the stories and experiences of other aviators can be equally valuable for increasing knowledge, safety, and skill. When pilots tell stories about their adventures, mistakes, close calls, or successes, those listening can learn from their experiences (Meyer, 2015). For example, imagine a student pilot in the early days of her flight training, listening to a story told by an experienced pilot who once forgot to check the fuel caps before a flight. The fuel caps had not been secured by the fueling agent, resulting in fuel being siphoned out of the airplane by suction during flight. This oversight could have ended in fuel exhaustion and catastrophe; however, the pilot noticed the loss of fuel and landed the aircraft without further incident. The experienced pilot then tells the student to always check the fuel caps before takeoff to avoid a situation like the one he encountered. The next day, when the student has a training flight, she remembers the story and checks the fuel caps. Stories like these augment pilots' learning and help them vicariously build their personal flying culture from others' experiences.

The example above illustrates a typical traditional face-to-face version of hangar flying. Before the Internet, pilots would gather at the local airport, drink coffee, and share their stories. While traditional hangar flying still happens today, it also happens online in Facebook groups, YouTube channels, and other social media gathering places. While it has been said that good pilots never stop learning (Mahany, 2023), the information sources and learning networks may have changed.

**The Evolution of Hangar Flying**

Long ago, when Orville and Wilbur Wright took to the sky and brought the world the invention of powered flight, formal flying education had yet to be born. The Wright brothers learned from others who had gone before them, like Otto Lilienthal, Samuel Langley, and Sir George Cayley, who had all studied and experimented with human flight (Barata & Neves, 2017). Barata and Neves noted that learning from the successes and failures of those who had come before them was necessary for the Wright brothers to bring the world the powered airplane. Later, after their success at Kittyhawk, the brothers began the first flight school in Montgomery, Alabama, with five students (Ennels, 2007). This site would later become Maxwell Air Force Base. It is clear from Ennels' (2002) writing that these students did not gain their training from books, magazines, or videos but through the hands-on training and teaching of Orville Wright. They learned socially via observation, listening to the experiences of the Wrights, and through hands-on practice with the flying machine. Edwards (2009) also offered evidence that during this time of early flying, the Wrights would provide informal advice to their students, which may have been some of the earliest examples of hangar flying.

Though later aviators like Amelia Earhart and Charles Lindbergh undertook formal flight training, both also learned in less traditional ways. For example, Lindberg bought a Curtiss Jenny aircraft and taught himself what he did not learn from formal training (Fife, 1927). Pilots always seek out other informal means of educating themselves when needed, and as time and technology progressed, so did this informal training. Hangar flying was one of these informal methods.

Ong (1982/2002) wrote that the earliest forms of human communication were oral, and language was used to pass traditions and knowledge to the next generation, often by sharing stories. Since telling stories to one another is a natural way of sharing experiences, it can be

assumed that the earliest forms of hangar flying were face-to-face encounters. Hangar flying

would later evolve into print mediums, and stories would be written for a broader audience to

share. *Air Facts*, a monthly printed publication, was founded in 1938 and contained stories and

experiences of pilots' flying adventures (Air Facts, n.d.). These journals continued to be

published for many years, providing hangar flying in a written medium. Many other aviation

magazines printed columns with the hangar flying theme, where stories written by pilots were

shared with the aviation community to promote knowledge and safety. Magazines such as *Flying*

and *Plane and Pilot* have had columns recounting pilot stories and experiences for many years.

Technology has always driven aviation (Murugan, 2023). After all, if it had not been for

the invention of the combustion engine, powered flight may have never been achieved. From

print, technology advanced aviation and hangar flying to video format with the invention of the

video cassette in the early 1970s (Britannica, 1998). In the early 1980s, while some were

reluctant to embrace video as an instructional tool (Laaser & Toloza, 2017), John and Martha

King started creating aviation courses on video (King Schools, n.d.-a). The Kings were pilots and

flight instructors who traveled the United States in the 1970s, giving in-person seminars on

aviation topics. The Kings are staunch advocates for aviation education in both formal and

informal modes. In one of their videos, entitled "Hangar Flying with a Point," the expert hangar

flyers told the tale of buying and flying their first multi-engine airplane, which had multiple

mechanical issues (King Schools, n.d.-b). These problems, coupled with many poor decisions on

the part of the pilot, John, nearly caused a serious accident on their flight home. It is a cautionary

hangar flying tale of how even smart, experienced pilots sometimes do dumb things.

Hangar flying then evolved even more when the Internet became mainstream. Today,

various blogs, podcasts, videos, and online magazine columns are the communication channels

for hangar flying stories to be told and shared. The Aircraft Owners and Pilots Association

(AOPA) has several podcasts that could be considered examples of hangar flying (AOPA, n.d.-

b). These include *Hangar Talk* (Twombly & Tulis, 2016–present), in which the hosts converse

about all things flying; *Never Again* (Tallman, 2013–present), in which pilots share stories of

frightening experiences so that others can learn from their mistakes; and *There I Was*

(McSpadden, 2017–present), which shares stories of unpredictable events in the cockpits. The

*Air Facts Journal* is now a fully online publication, still sharing the stories of pilots with the

world to increase knowledge and safety (Air Facts, n.d.). Aviation organizations such as AOPA,

the Experimental Aircraft Association (EAA), the Air Safety Institute, and the Federal Aviation

Administration use blogs, vlogs, and social media platforms to share stories and information in a

high-tech form of hangar flying. Additionally, multiple user-generated videos are available via

YouTube, TikTok, and other online video-sharing sites.

Since YouTube now has over 2.7 billion users (Shewale, 2023), and TikTok has 1.7

billion (Ruby, 2023), these communication channels have become a source of information and

entertainment for many, including aviators. It is estimated that 720,000 hours of video are

uploaded to YouTube each day (Shewale, 2023), and if only .01% of those were aviation hangar

flying-type stories, that would still be 72 hours of video each day. Given the many YouTube

channels the researcher discovered related to general aviation, this fact is easy to imagine. The

count was stopped at 50 channels, but there were many more. Prior research found that pilots can

gain helpful information and education from watching these digital hangar flying stories on

YouTube (Frizzell, 2022). John Zimmerman, the chief editor of *Air Facts Journal* and the

president of Sporty's Pilot Shop, concluded that YouTube was the primary medium that had the

power to inspire today's youth to pursue aviation (Zimmerman, 2022).

In addition to YouTube, hangar flying is happening via various other social media platforms, including the largest, Facebook. Like YouTube, Facebook has multiple general aviation-themed groups that one can join to discuss everything about flying that an individual would want. The researcher belongs to 32 of these groups, although he is not active in all of them. One of these groups is called *Airplanes and Coffee,* which has 163,000 members (Airplanes & Coffee, n.d.). Individuals ask for advice about situations, complain about regulations, and share their latest flying adventures with other aviators. Many other pilots may respond to a single post, creating a sizable digital hangar flying session. The digital realm of hangar flying allows thousands of individuals to effectively be "in the same room," sharing stories and experiences without stepping one foot outside their door, visiting an airport, or even breathing the same air as their fellow pilots. In an age when pandemics are a reality, digital hangar flying is a safe and convenient way for pilots to learn and socialize.

Although the origins of hangar flying may be unknown, it has evolved from face-to-face interactions around the airport to now include various digital modalities like YouTube and Facebook. However, the communication act remains the same: to share flying experiences with others who might appreciate and learn from them. Today, pilots may engage in multiple forms of hangar flying. They may talk with other pilots face-to-face at the airport, respond to a post in a Facebook group, and then later watch a YouTube video that recounts a pilot's true story of a near accident. Multiple modalities of hangar flying may contribute singly or cumulatively to a general aviation pilot's flying culture.

**Personal Flying Culture**

How can hangar flying build a personal flying culture? First, an understanding of a personal culture must be gained to answer this question. Culture consists of people's beliefs,

traditions, attitudes, behaviors, and, essentially, their way of life (Cambridge University Press & Assessment, n.d.-a). Some distinctions have been made between public culture, which refers to the elements that apply to a group, and those that are more individual. Lizardo (2017) said that culture can exist at the personal, individual level, and group levels, meaning that individuals can have their own beliefs, attitudes, and worldviews that may be similar or different from the larger culture to which they belong. One's culture is often attained through social learning by observation and immersion in the language and environment of the group, leading individuals to model their behaviors in alignment with what they have learned and observed (Yilmaz et al., 2019). This description aligns well with this study's focus, as social learning is vital to understanding how hangar flying stories teach and shape pilots.

Further, a personal culture is one that individuals create based on their values, behaviors, practices, and processes and can be distinct from a larger culture that one may belong to (Daimler, 2021). A person could apply this concept to a pilot's personal approach or culture of flying. In that case, it could mean how individual pilots view flying, what kind of flying they are drawn to, what practices they learn about and implement, and where they choose to get their information. This idea raised many questions for this study: When pilots fly, do they seek information to create a culture of safety or risk, of practicality or adventure? Do they have a flying culture focused on building skills and knowledge or making money from aviation? Are frugal pilots more concerned with saving money than addressing aircraft maintenance issues? Do the narratives that pilots curate from hangar flying cultivate particular personal flying cultures? Can pilots curate the content of hangar flying much like social media algorithms feed a user content based on what they like or comment on (Lehman, 2023)? For example, a pilot engages in hangar flying about repairing airplanes themselves to save money. In that case, they might

continue to seek out and curate stories that feed this preference, thus building a personal flying culture of "do it yourself."

Individual and group cultures are also influenced by communication rituals in which individuals share meaning and beliefs through participation in some kind of ritual (Carey, 1975). Carey believed communication rituals were closely tied to culture, helping establish and maintain it. Hangar flying could be seen as a communication ritual involving a shared fellowship of aviators exploiting their common traits within a community. This community could be at the local airport, online in a Facebook group, or amongst viewers in the comment sections of YouTube videos.

Even with this understanding of how hangar flying and storytelling may influence a pilot's culture, much remains unknown concerning the connection between hangar flying and what pilots learn from the practice.

## Problem Statement

### Lack of Research

The primary problem this research addressed was that few studies have explored hangar flying as a communication practice for vicarious learning in the broad development of general aviation pilots' personal flying culture. While other studies have investigated the use of storytelling in various disciplines, from psychology to information technology (Austin et al., 2016; Landrum et al., 2019), hangar flying has only been discussed briefly in the non-scholarly realm of magazine articles, blogs, and social media (Harrison, 2021; Vandenputte, 2021). Additionally, general aviation has not been explored as a context in storytelling research, nor has the general aviation pilot population been studied regarding vicarious learning. Again, there is a lack of research that investigates a connection between storytelling and social learning, and none

could be found that applied these concepts within general aviation. Further, little is known about where pilots informally seek information and knowledge beyond their formal flight training and how those sources might influence their personal approaches or flying cultures.

**Formal Flight Training is Deficient**

A second problem is that formal general aviation pilot training cannot prepare future aviators for real-life scenarios or difficulties they may encounter, resulting in higher accident rates. The National Transportation Safety Board reported that in 2021, there were 1,156 general aviation accidents, 210 of which resulted in fatal injuries to 344 individuals. Over half of all general aviation accidents are caused by pilot error due to inadequate or improper training and a lack of experience (Pilot Institute, 2023). Major et al. (2017) found that many weather-related accidents were caused by deficiencies in pilot training and lack of experience. In a national survey, Major et al. found that many pilots reported that they received enough training to pass the checkride, the test needed to become a pilot, but admitted that their overall flight education was lacking in some areas, especially real-world weather situations, and also revealed that they do not receive ongoing training once they have earned their pilot certificate. Another example is provided by Boyd (2023), who also illustrated deficiencies in general aviation formal education regarding flying in potentially hazardous flight conditions and suggested more demanding and frequent training or recurrency for all pilots.

The simple truth is that aviation can be a dangerous and deadly game. Pilots cannot afford to learn all the lessons or make all the errors themselves, as no pilots would be left. Thus, the need to vicariously learn through the stories and experiences of others is vital not only to the pilots' safety but also to the safety of all who fly with them.

Hangar flying could be an informal supplement to formal and traditional general aviation flight training. Stories like these could augment the learning experience of pilots, prevent future accidents, and build a culture of safety in the aviation community. However, much about how and what hangar flying communicates to pilots is unknown. Given this lack of information and scholarly research, a more comprehensive exploration of hangar flying's use as an informal learning tool and its contribution to the development of general aviation pilots' personal flying cultures is needed to understand the impact of this communication phenomenon on flight safety and the general aviation community.

## Purpose Statement

The purpose of this qualitative content analysis was to explore hangar flying as a communication practice for vicarious learning in the broad development of general aviation pilots' personal flying cultures by identifying emergent themes within online digital hangar flying content. Through this exploration, the goal was to fill gaps in current scholarly literature and investigate hangar flying's use as an informal learning tool that could increase aviation safety, prevent accidents, and strengthen pilot proficiency.

## Significance of Study

The concept of *hangar flying* has been written about in various blogs, online articles, and print but not addressed well in scholarly literature, specifically communication research. As this study focuses on understanding hangar flying as a communication practice, the findings will significantly contribute to the body of communication research. This study provides a starting point for future discussions about hangar flying, its use as a communication tool, its role in informal and continuing pilot education, and its contribution to personal flying culture, flight safety, and the larger general aviation community.

Storytelling is known as *narrative communication*, which has been proven to be an effective tool for teaching and learning (Dunn & Reed, 2020; Landrum et al., 2019; Zazkis & Liljedahl, 2009), but there is a lack of information regarding a connection between storytelling communication and vicarious learning in general aviation. Exploring the content of online hangar flying videos and the perceptions of general aviation pilots, as shown in the connected video comments, is beneficial to both communication and aviation scholarship. The value of this study is found in filling gaps in both fields by providing qualitative scholarly research on the communication practice of hangar flying as a possible informal communication tool to educate pilots, improve flight safety, and reduce accidents.

The study benefits certified pilots, student pilots, flight instructors, aviation enthusiasts, and general aviation industry leaders as it explores the impact of an informal educational tool that may bolster pilot proficiency and safety and strengthen the aviation community. As previously mentioned, aviators need the vicarious learning experiences that come from consuming the stories of other pilots who have "been there and done that" and lived to tell about it. Pilots cannot limit their learning to only their own experiences and mistakes, as few pilots would be left to fly. They must take advantage of the stories of others to prevent future mishaps and thrive in aviation. Further, the research will help industry leaders better understand where pilots are informally learning so that they can create more hangar flying content to impact more pilots. The study also extends the concept of vicarious learning beyond observational learning (Bandura, 1977) to include listening and sharing others' experiences through narratives.

## Research Questions

The research study explored hangar flying as a communication practice by analyzing the content of online hangar flying videos and the responses made by pilot viewers. The study aimed

to fill gaps in communication and aviation research concerning the connection between hangar

flying stories and their use as vicarious learning tools in cultivating general aviation pilots' flying

cultures. The following questions drove the study:

**RQ1:** *What are the primary themes of the digital hangar flying content?*

**RQ2:** *How do the viewers of the digital hangar flying content respond to it?*

**RQ3:** *What inferences can be made concerning a connection between vicarious learning*

*and hangar flying?*

**RQ4:** *What primary goals of the digital hangar flying content can be inferred?*

## Theoretical Perspectives

This study explored hangar flying in three ways: as a type of storytelling communication,

a tool for vicarious learning, and as an influencer of a pilot's unique flying culture. Considering

these aspects, three theories were chosen to provide a broad perspective of each area and guide

the research. The theories chosen were Fisher's (1984) narrative theory, Bandura's (1977) social

learning theory, and Gerbner's (1969) cultivation theory. Since this study was qualitative, the

goal was not to prove or disprove these theoretical perspectives but to use them as lenses to view

the communication phenomenon of hangar flying (Creswell & Creswell, 2018). Together, these

theories guided the research in investigating how hangar flying is used as a vicarious learning

tool in developing a general aviation pilot's flying culture.

### Narrative Theory

Narrative theory is a communication concept that posits that individuals tell stories to

rationalize their world, creating shared meaning and understanding of actions and behaviors

through communication (Fisher, 1984). Walter Fisher (1984) claimed that stories are a primary

way of constructing reality and that human beings create meaning and understand the world

through stories. Put simply, individuals tell stories to rationalize their world, creating shared

meaning and understanding of actions and behaviors through communication (Fisher, 1984).

Fisher (1985) also pointed out that stories can provide a rationale for decisions or actions and

may influence an individual's future behaviors. Thus, the motive of a story or storyteller may

also be important to consider in how individuals use narratives to communicate and construct

reality. From Fisher's viewpoint of narrative socially constructing reality, this study explored the

communication practice of hangar flying. As pilots tell and share stories and experiences, these

narratives provide the means for them to construct their personal realities of flying and influence

the overall culture of aviation.

Myers (2022) qualitatively explored the use of storytelling for vicarious learning amongst

air medical flight crews, finding that the participants valued the stories of other crew members to

gain knowledge and skills. In another study, Alvarado et al. (2020) studied entrepreneurship and

vicarious learning and discovered that students in an entrepreneurship education class reported

benefiting from listening to the stories of failures of other entrepreneurs.

**Social Learning Theory**

Psychologist Albert Bandura (1977) developed social learning theory with the central

premise that humans learn best by observing others' behaviors, and through this vicarious

learning, people change behaviors, although this result is not always necessary. Bandura (1977)

said that learning could occur without imitation. Bandura (2006) also referred to this practice as

*social modeling*, in which individuals observe the behavior or listen to the experiences of others,

benefiting from their mistakes and successes without needing to experience it themselves.

Vicarious learning and social modeling are central to social learning theory. These concepts

apply to many communication scenarios, such as children observing and modeling their parents'

use of expletives (Wright & Mokbel, 2016) or a student pilot listening to a flight instructor describe how to perform a maneuver, observing the instructor perform it, and then reproducing the action. Rymanowicz (2015) described observational learning as when children learn through watching and listening to others.

Though often focused on how individuals learn vicariously through observation, this research extended social learning theory's focus on observation to include listening to others' experiences, as Rymanowicz's (2015) work described. Horsburgh & Ippolito (2018) also studied medical students as they watched instructional mentors and listened to their experiences. The students said they learned new information from their observations and hearing of the mentors' experiences, showing that vicarious learning can be visual *and* auditory. Further, Mayes (2015) explored vicarious learning through interpersonal dialogues, which showed that social learning can extend beyond visual observation to include other communication channels. Through hangar flying stories, a pilot may learn vicariously through observation and listening to the experiences of other pilots.

### *Social Learning Theory Renamed*

Social learning theory was renamed social cognitive theory to emphasize specific individual cognitive processes humans use to process information from observational learning (Bandura, 1986). Social cognitive theory builds upon social learning theory and still focuses on vicarious and observational learning, although some key differences exist (Nickerson, 2023). Social cognitive theory added the concept of *self-efficacy*, or the belief in one's abilities to fulfill a goal or perform an action (Bandura, 1986). Social learning theory posits that all learning is through observation and reinforcement, while social cognitive theory allows for learning through direct experience. Social learning theory focuses on the individual's capacity to learn, while

social cognitive theory acknowledges other factors like environment, past experiences, and self-efficacy in learning (Nickerson, 2023).

Both theories informed the study, as social learning theory is the basis for how hangar flying works as an informal vicarious learning tool, and social cognitive theory builds on this concept to suggest how pilots' flying cultures and perspectives are also influenced by their past experiences, past hangar flying stories, and their self-efficacy. As this self-efficacy grows, and pilots gain more experience, listen to more hangar flying stories, and increase their skills, their personal flying culture also changes, as will their choices of what narratives to consume. While these theories have some differences, this study references social learning theory throughout, as it is the primary guiding theoretical perspective.

**Cultivation Theory**

While social learning theory holds that individuals learn by observation, Gerbner's (1969) cultivation theory holds that they similarly cultivate or acquire beliefs and attitudes through immersive television viewing. Gerbner believed that television programming in the 1960s contained content laden with violence and that heavy exposure would cause individuals to develop fearful beliefs about the world (Romer et al., 2014). Similarly, Bandura (1978) also posited that heavy exposure to violence would cause children to learn aggression and be more likely to behave aggressively in social situations. Gerbner et al. (1986) believed television to be a centralized system for storytelling, so pervasive that the stories shaped not only individual cultures and beliefs but also the national culture. While Gerbner developed his theory long before social media, other scholars have studied cultivation theory concerning individuals' perceptions and attitudes influenced by Facebook posts (Hermann et al., 2020).

Similarly, this study analyzed online videos depicting hangar flying stories and the viewer responses to make inferences regarding how general aviation pilots may cultivate their personal flying culture from these stories. The research suggests that hangar flying presents narratives that pilots curate to form their unique flying cultures. For example, if they heavily consume hangar flying messages focused on risk mitigation, they will likely cultivate flying cultures and beliefs focused on safety. Thus, the content themes of hangar flying stories that indicate vicarious learning were crucial to identify and investigate.

### Definitions

The following terms and definitions are provided to ensure that the reader understands the researcher's specific use of them throughout the study.

1. *General Aviation:* The segment of aviation consisting of all civil aviation operations other than scheduled air services and non-scheduled air transport operations and that does not include military or airline operations (International Civil Aviation Organization, 2009). It is also referred to as Part 91 operations and consists of small private aircraft flown for recreation or business.

2. *General Aviation Pilot:* For this study, the term refers to anyone who has attained a minimum of a private pilot certificate from the Federal Aviation Administration (Private Pilot Privileges and Limitations, 14 CFR § 61.113, 2023).

3. *Hangar Flying:* Refers to the sharing of flying stories and experiences among pilots, often occurring in an aircraft hangar, although the act is not limited to a specific setting (Harrison, 2021). This communication practice is also known as *hangar talk* (Kearns & Sutton, 2013).

4. *Personal Flying Culture:* A term created by the researcher that refers to a pilot's personal worldview or perspective on flying aircraft. The term encompasses the unique set of knowledge, skills, and attitudes that a pilot develops over time. Examples may include safety, risk-taking, frugality, or adventure. Through the communication and curation of narratives (hangar flying stories), pilots come to understand the world of aviation and construct their personal view of it, thereby shaping the kind of pilot they become.

5. *Vicarious Learning:* A central element of Albert Bandura's (1977) Social Learning Theory focused on learning by observing, listening to, or reading the experiences of others without performing the learned behavior directly.

6. *Purpose-Built Content:* Any communication artifact (i.e., article, post, tweet, video, or other content) often created by a brand to solve a specific problem or fulfill a purpose (Katai, 2023). It is also referred to as *purpose-driven content*. An example would be a hangar flying video created by the Air Safety Institute with the purpose of increasing flight safety.

7. *User-Generated Content:* Any content, including texts, videos, images, reviews, and more, created by individuals rather than brands or organizations (Beveridge, 2022). An example is the YouTube Channel known as Missionary Bush Pilot (n.d.).

8. *Overt Hangar Flying:* Overt means "done or shown publicly or in an obvious way" (Cambridge University Press & Assessment, n.d.-c). Using this definition, the researcher named overt hangar flying content as that which directly conveys a specific lesson or message. Videos often depict a single person telling a story to the camera or a usually silent and invisible interviewer.

9.  *Covert Hangar Flying:* Covert content is less obvious and occurs when a pilot does not

   directly tell a story but allows the viewer to share an experience. This type of storytelling

   was most commonly found in what the researcher called ride-along hangar flying, in

   which the viewer is an unseen passenger in the cockpit sharing the flight experience via

   cameras.

**Summary of Chapter**

Chapter 1 introduced the problems of a gap in aviation and communication research

concerning the topic of hangar flying and the deficiencies in formal general aviation flight

training. Hangar flying was introduced as a possible informal educational tool to foster vicarious

learning, develop general aviation pilots' flying culture, and increase flight safety. The chapter

provided background information regarding storytelling, general aviation, the evolution of

hangar flying, vicarious learning, and personal flying culture. Additionally, the chapter

introduced three theoretical perspectives that guided the research, along with a brief overview of

the study's methodology. Chapter 2 reviews relevant literature, provides more insight into the

theoretical perspectives, and discusses the communication traditions of the study.

## CHAPTER 2: LITERATURE REVIEW

### Overview

Chapter 1 established the problem that few studies had explored hangar flying as a communication phenomenon or its possible contribution to a pilot's vicarious learning or personal flying culture development. Hangar flying is a well-known term and communication act within the aviation community; however, it is known less outside of it. Thus, this qualitative study aimed to add to aviation and communication research by exploring hangar flying as a communication practice for vicarious learning in the broad development of general aviation pilots' personal flying cultures. Chapter 2 presents the topic's situation to communication traditions, expounds on the previously mentioned theoretical frameworks, reviews related literature, and provides a summary.

### Situation to Communication Tradition

Many students and scholars are challenged by defining and understanding the various facets of communication, and Robert Craig's (1999) framework of traditions can help make sense of this complex process (Maguire, 2006). Craig (1999) attempted to offer a constitutive model for communication theory that allows communication to be conceptualized via seven traditions, including rhetorical, semiotic, phenomenological, cybernetic, sociopsychological, sociocultural, and critical. Craig posited that there was no consensus among scholars concerning communication theory as a field. He offered his traditions as a starting point for scholars to begin discussions, engage in debate, analyze, and assess various viewpoints on communication, and work toward more unified thinking about the field of communication theory (Craig, 2015).

**Sociocultural Tradition**

This research study is primarily situated in the sociocultural tradition, as it seeks to understand how pilots may socially construct their perspective of flying and aviation through storytelling. The study explored how pilots may use context-based storytelling (hangar flying) as a social learning tool and how the stories and the knowledge acquired through them may influence pilots' personal culture of flying. For example, some individuals may listen to a story of an aircraft accident and develop a focused attention to safety in their flying. Another may create a unique culture of risk-taking by listening to stories of daredevil stunt pilots.

Craig (1999) designated the sociocultural tradition as focused on how reality is socially constructed through human communication interactions. Further, communication was "a symbolic process that produces and reproduces shared sociocultural patterns" (Craig, 1999, p. 144). Maguire (2006) added that in the sociocultural tradition, communication was "theorized as the (re)production of social order" (p. 90). Through communication, human beings develop worldviews, practices, and processes that help them better understand the world and their role in it. Although individuals are not born with an understanding of culture or society, it is socially constructed through interactions with others, creating the unique way each person sees the world (Magut, 2016). In this tradition, a pilot's personal view or culture of flying is also seen as socially constructed. Meaning, norms, rules, and understanding come from their interactions with other pilots and from other sources of hangar flying, like print magazines, videos, and social media posts. Apuke (2017) said that communication is how people understand the world, and this understanding shapes the human beings they become. Through the communication and curation of narratives (hangar flying stories), pilots come to understand the world of aviation and construct their personal view of it, thereby shaping the kind of pilot they become.

**Sociopsychological Tradition**

Additionally, the study can be situated in the sociopsychological tradition. Craig (1999) describes this tradition as theorizing communication regarding how people interact and influence one another in relationships. The human mind is the focus of this tradition, delving into the exploration of individual psychological states, emotions, and attitudes. The tradition also houses theories that investigate cause-and-effect relationships. Craig asserted that communication was a common element of cause-and-effect relationships, and a person's psychological state can influence the communication process in these relationships. In short, communication can affect individuals' social and psychological behaviors and those they interact with, and this tradition provides a framework for studying these influences.

In this research, though primarily focused on how stories influence learning and help build personal flying cultures for pilots, the presence of cause-and-effect relationships warrants a mention of the sociopsychological tradition. When pilots consume an aviation story via hangar flying, this story may cause pilots to encounter changes in their psychological state, resulting in a changed behavior or a new perspective on flying. The cause (the story) may influence the pilots' view or culture of flying (the effect). While the degree of this influence or change would be difficult to measure or even accurately discern, it seems fitting to at least mention the aspects of the study that fit the sociopsychological tradition.

**Situation of Theories to Traditions**

The research study uses social learning theory (Bandura, 1977), narrative theory (Fisher, 1984), and cultivation theory (Gerbner, 1969) as guides to offer broad perspectives on the topic. Concerning the research topic, the three theories are situated in the sociocultural tradition. Interestingly, two of these theories can also be located within other traditions. Social learning

theory could be described as a sociocultural theory as it views learning as a social process, constructing an individual's reality and understanding of the world through interactions with and observations of others (Bandura, 1971; Jadallah & Ballard, 2021; Magut, 2016). Narrative theory has roots in the rhetorical tradition, as it has often been seen as purpose-driven communication in settings where stories have been used for persuasive effect (Phelan & Rabinowitz, 2012). Cultivation theory could be situated in the sociopsychological and sociocultural traditions as it focuses on how media can influence the perceptions and behaviors of individuals (Chung, 2014; Hoffman et al., 2023; Wang et al., 2016; White, 2012) while also looking at how media influences society as whole, affecting the shared values of the culture (Gerbner, 1969; Hermann et al., 2023; Stacks et al., 2015).

While these are all possibilities, these three theories support one another in the sociocultural tradition as each can also be interpreted as socially constructing reality and understanding for individuals. General aviation pilots engage in hangar flying in various ways, vicariously learning from stories that shape and cultivate their understanding of the world of aviation and their personal flying culture. In this way, narrative theory is at work in the stories, social learning theory is at work in the vicarious learning process the stories provide, and cultivation theory helps understand how these stories influence the pilots' perceptions of flying and behaviors. The weaving together of these theories from a sociocultural perspective aids in understanding how hangar flying helps pilots learn and build their personal flying culture.

### Theoretical Framework

This research study was qualitative, and thus, theories were used to give a "broad explanation for behavior and attitudes" suitable for exploring the communication phenomenon (Creswell & Creswell, 2018, p. 61). Theories provided frameworks or lenses to view hangar

flying and, in so doing, gained more knowledge and perspective. In short, communication theory allowed the researcher to better explain and understand the concept and influence of hangar flying as a storytelling act. The goal of this qualitative research was not to prove any theory but rather to use theories to explore the topic within a context. The researcher did not expect that any theory or group of theories would provide any conclusive truth regarding the topic. Instead, theories served as guides for the research, focusing on storytelling communication and leading the researcher along the path of exploration of the phenomenon.

This study utilized three theories to provide perspective and broader background to hangar flying and its role in aviators' social learning and personal culture building. The theories are Bandura's (1977) social learning theory, Fisher's (1984) narrative theory, and Gerbner's (1969) cultivation theory.

**Social Learning Theory**

Much of the earliest research claimed learning was built upon rewards and punishments, such as the tasting of sweet food resulting in pleasure and touching a hot stove resulting in pain (Balliet et al., 2011). In the early years of developing learning theory, most ideations were primarily supported by studies involving learning in one-person situations (Lundin, 1961; Rotter, 1954; Skinner, 1953). Some scholars thought the view that learning occurs through first-hand experiences was limited and negated other ways that human beings learn concepts, including the possibility that they can learn from each other (Bandura & Walters, 1963). Psychologists Albert Bandura and Richard Walters (1963) posited that learning could occur through observation and imitation of others and that this kind of learning was more effective for long-term knowledge retention. This concept became known as the *social learning theory*. It drew from previous research of scholars such as Miller and Dollard (1941), Rotter (1954), and Maccoby and Wilson

(1957), who studied the roles of imitation, reinforcement, and observation in childhood learning.

While other scholars have contributed to a more extensive understanding of social learning

theory, Bandura is considered the primary author. Social learning theory is well summarized

here:

> Learning would be exceedingly laborious, not to mention hazardous, if people had to rely
>
> solely on the effects of their own actions to inform them what to do. Fortunately, most
>
> human behavior is learned observationally through modeling. Because people can learn
>
> from example what to do, at least in approximate form, before performing any behavior,
>
> they are spared needless errors. (Bandura, 1977, p. 22)

Bandura's theory began with his research into incidental learning in children, which

focused on the tendency to develop aggressive behavior if the child observed aggressive

behavior in others (Bandura & Huston, 1961). Ninety percent of the child subjects in the study

adopted aggressive behaviors after watching them (Bandura & Huston, 1961). This study led to

another, entitled *Transmission of Aggression Through Imitation of Aggressive Models* (Bandura

et al., 1961), in which children again observed adult models portraying aggressive and

nonaggressive behaviors in play activities. Among the toys and games for the adult models to

interact with was a five-foot-tall inflatable Bobo the Clown doll. The adult model in the

aggression group hit, kicked, and verbally assaulted the doll, while the adult in the nonaggression

group either ignored or gently played with it. Next, the children in each experimental group were

placed in the play areas with the doll and other toys. The children who had observed the

aggressive behavior imitated the same actions they had witnessed, even mimicking the verbal

phrases used by the adults (Bandura et al., 1961). The authors posited that "imitative learning can

be clearly demonstrated if a model performs sufficiently novel patterns of responses which are

unlikely to occur independently of the observation of the behavior…and if a subject reproduces these behaviors in substantially identical form" (Bandura et al., 1961, p. 576). The research concluded that those exposed to aggressive acts are more likely to learn from and imitate them when placed in similar situations. These results confirmed Bandura's thoughts on imitation and added to the current research concerning observational learning.

*Social Learning and Personality Development* (Bandura & Walters, 1963) was another seminal work built from Bandura and colleagues' (1961) work with children and the Bobo doll. In this work, Bandura and Walters argued the viability of observational and vicarious learning in affecting the social behavior of children and adults. Specifically, the authors discussed how observing and imitating others can shape personality development and affect prosocial and deviant behavior. Much attention is paid to how children observing aggressive or deviant behavior will likely lead to future imitation of those behaviors and how, by knowing this tendency, steps can be taken to decrease or increase the chances of this future imitation. Bandura and Walters posited, "One can readily produce a highly aggressive child by merely exposing him to successful aggressive models and rewarding the child intermittently for aggressive behavior" (p. 159). However, they mentioned that many steps can be taken to reduce or eliminate future aggression after it has been observed, including modeling nonaggressive behavior and limiting a child's exposure to aggressive behaviors (Bandura & Walters, 1963).

Later, Bandura (1977) wrote an entire book titled *Social Learning Theory*, which was often cited in the works of scholars who followed him. The works by Bandura and his colleagues have laid the foundation for a better understanding of how humans process and act on information. This theoretical perspective suggests that pilots may be able to learn information via hangar flying stories and then choose to model behaviors or attitudes from the stories.

Bandura's original social learning theory has been applied to many fields, including communication, psychology, education, agriculture, social media studies, and more (Landrum et al., 2019; Gallo, 2019; Zazkis & Liljedahl, 2009; Humpherys & Babb, 2020; Sharf et al., 2011; Austin et al., 2016). For example, Havenhill (2023) applied social learning theory in a longitudinal study of gender portrayals in Super Bowl commercials to determine how these commercials influenced the social construction of gender. In agriculture, BenYishay and Mobarak (2019) leveraged social learning among farmers to increase the adoption of new technologies for farm production. Interestingly, these researchers purposely created communication interactions between farmers that enabled social learning to influence their behaviors. Farmers and government agricultural agents spoke with farmers and shared how technologies had benefited their operations. Even though these interactions did not occur naturally, the experiment showed that they influenced farmers and positively altered their views of technology.

In the new digital age, Deaton (2015) studied how social media communication could enhance social learning in classroom settings. Deaton argued that social media had the potential to help educators positively impact social learning factors and improve overall student achievement. He concluded that social media use should be embraced in education as social media platforms could allow students to exchange knowledge in an interactive environment far beyond the traditional classroom. Thus, as these communication interactions occur, there is space for social learning, imitation, and influence of future behaviors, attitudes, and actions. Social media may be a valuable tool for other social learning interactions like hangar flying between pilots. In a similar study, Zhou et al. (2020) found that YouTube videos could be a viable learning resource. They concluded that the sociability of the platform aligned with social

learning and cognitive theories, which posit that learning occurs through interacting with and observing others. YouTube allows users to interact with one another through likes, comments, and replies concerning the video content, which these researchers believed could increase social learning. This research is supported by others who investigated the learning potential of YouTube videos and concluded that this content could be a valuable resource leading to a greater social learning experience as users connect and communicate with one another (Lee et al., 2017).

An older study that applied social learning to aviation contexts looked at how pilots who observed others could learn and apply knowledge. Shebilske et al. (1998) discovered that observational learning effectively compensated for hands-on practice in aircraft trainer simulators. By watching others perform tasks, the observer learned just as well and could later perform the task efficiently. Although the observers watched over the shoulders of the pilots in the simulator, they could apply what they gained vicariously and complete the exercises without any additional instruction.

### Social Learning Theory Becomes Social Cognitive Theory

The original theory evolved when Bandura (1986) developed the social cognitive theory (SCT). Social cognitive theory expanded his work with social learning beyond social contexts to emphasize specific individual cognitive processes that human brains use to process information from observations. SCT encompasses social learning theory but has been viewed as a separate stand-alone theory (Nickerson, 2023). Nickerson pointed out that both Bandura's theories emphasize observational and vicarious learning but maintain some key differences. Social learning theory focuses on reinforcing knowledge, while SCT emphasizes human cognitive processes involved in learning. Social learning theory posits that all behavior is learned through observation, but SCT allows for learning through direct experience. Social learning theory is

focused on individualistic learning, whereas SCT acknowledges the importance of environmental factors in learning.

Grusec (1992) pointed out that renaming the theory to *social cognitive theory* better represented the concepts and processes Bandura had been advocating since the 1960s. Further, after 1986, Bandura consistently referred to his theory as social cognitive theory, leaving the *social learning* moniker behind (Grusec, 1992). Social learning theory is the foundation of social cognitive theory, and thus, the terms are often used interchangeably in scholarly research, which makes contrasting the two challenging. Interestingly, some scholars have combined the names of these theories into *social cognitive learning theory* in what they believe is a more accurate representation of the framework (Money, 1995; Whitham et al., 2013).

While still holding all the core principles of social learning theory, Bandura's new social cognitive theory added the concepts of self-efficacy and reciprocal determinism as central tenets (Bandura, 1986). *Self-efficacy* refers to the belief in one's abilities to fulfill a goal or perform an action. Bandura concluded that the more self-efficacy one has, the more likely one will be motivated to reproduce observed behaviors. Bandura (2008) later wrote that achieving self-efficacy involves setting goals, pursuing them, and achieving mastery. In addition, one builds self-efficacy by watching others achieve mastery, gaining inspiration from the experience, and pursuing their goals. Children, as well as adults, learn from watching others succeed and fail, and this observation builds confidence and resilience.

*Reciprocal determinism* refers to the mutual interaction of the person, the environment, and the person's behavior in the social learning process (Bandura, 1986). The social cognitive theory advanced that learning and behavioral change were determined by more than positive or negative reinforcement, as social learning theory posited, but also by individuals' past

experiences, as these shape their future decisions and influence whether they would engage in a specific behavior or not (Bandura, 1986).

Perhaps the most significant difference between social learning theory and social cognitive theory is the focus on human agency in self-regulating learning and environment (Bandura, 2001). Simply put, humans are not passive learners; instead, they have control over their thoughts and behaviors. Individuals can be both producers and products of their learning (Bandura, 1989). Additionally, a person's interpretation of behavior can alter their perceptions and future actions or decisions (Bandura, 1986).

Social learning theory is more limited to the study of an individual's learning within a social context. However, social learning theory is not passive as it still encompasses the core element of observational and vicarious learning. According to Bandura (1977), for successful vicarious learning to occur, four processes are necessary: attention, retention, production, and motivation. An individual must decide to attend to the information or observation, retain enough knowledge to reproduce the action or behavior, possess the ability to produce the observed behavior, and desire to reproduce the modeled behavior (Bandura, 1977). After renaming the theory as social cognitive theory, Bandura (2006) added that vicarious learning could also be referred to as *social modeling*, in which individuals observe the behavior or listen to the experiences of others, benefiting from their mistakes and successes without needing to experience it themselves. These concepts apply to many communication scenarios, such as children observing and modeling their parents' use of expletives (Wright & Mokbel, 2016) or a student pilot listening to a flight instructor describe how to perform a maneuver, watching the instructor perform it, and then reproducing the action.

The theories proposed by Albert Bandura (1977, 1986) emphasize the role of modeling and imitation in acquiring new behaviors and beliefs. Though social learning often focuses on observations, Bandura (2006) suggested that storytelling was another tool for vicarious learning. Bandura (2012) applied social learning/cognitive theory to how storytelling can influence global issues via various dramatic productions that could be broadcast through mediums such as television and the Internet. He discussed how television dramas could shape the behavior of individuals through symbolic modeling regarding issues like the AIDS epidemic, the subjugation of women, and overpopulation. He posited that storytelling was an effective communication device for influencing the vicarious learning of individuals concerning these global issues and had the power to bring about both personal and social change (Bandura, 2012).

This connection between social learning and storytelling is helpful to the current research in that narratives often feature characters who model behaviors and face consequences. Hangar flying stories may provide those characters and vicarious learning experiences that shape individuals' attitudes, behaviors, and worldviews. Through hangar flying stories and subsequent modeling, pilots may gain knowledge that helps them socially construct their personal flying culture.

### *Criticisms of Social Learning/Social Cognitive Theory*

Although Bandura and others have presented much evidence to support the salience of social learning via observation, there have also been many criticisms of this theoretical construct. One example is Bandura's lack of research addressing changes in social learning concerning changes in subjects' ages (Grusec, 1992). Bandura's work primarily involved young children but generalized the findings to apply to all ages. However, he produced little evidence to support that social learning processes functioned similarly for adults as children. Coates and Hartup (1969)

were scholars who criticized Bandura's early work in social learning and aggression concerning

changes in age. They attempted to recreate some of Bandura's early experiments and succeeded

in casting some doubt regarding the validity of the research. Coates and Hartup could not

replicate Bandura's findings regarding the children's verbalizations while watching observed

behaviors. Their experiments contradicted his, especially regarding children's verbal responses in

varying age groups (Coates & Hartup, 1969).

Psychologist Christina Lee criticized Bandura's concept of self-efficacy as being non-

scientific and imprecise (Lee, 1989). Lee argued that there was no precise way to measure a

person's self-efficacy level, making applying the idea practically challenging. Lee further argued

that the terms *self-efficacy* and *social learning* have become too familiar and overused in

scholarly writing, leading to widespread acceptance without much understanding of their

theoretical implications. The theory, she claimed, has strength for describing human behavior but

is not an adequate model for explaining human behavior. Her critique is summed up well here:

Bandura's self-efficacy theory is a vague descriptive model, not an explanatory theory. It

provides clinicians and researchers with a non-scientific framework which describes, in

metaphorical terms, a hypothetical process by which behavior might result from current

environmental, and other, influences. (Lee, 1989, p. 122)

Lee's focus in the article is on the lack of usefulness of the concept of self-efficacy and, by

relation, social cognitive theory. Lee pointed out the inability of the approach to accurately

predict future behaviors, which she says makes it useless and impractical. However, despite these

claims, several scholars have shown the usefulness of Bandura's theory, including Sabido's work

to reduce Mexican birth rates and increase condom usage through educational telenovelas

(Murphy, 2021).

Vicarious learning and social modeling are central to social learning and social cognitive theories and are most important to this study. These concepts are elaborated on more in a later section. Thus, both theoretical approaches are used to guide aspects of the study. Social learning theory informs the research on the elements of vicarious learning that occur when general aviation pilots engage in hangar flying, while social cognitive theory adds the components of human agency, environmental factors, and past experiences as the pilot curates specific narratives from hangar flying in shaping their flying culture.

**Narrative Theory**

Narrative perspectives have roots in rhetoric, in which the narrative has been seen as "somebody telling somebody else on some occasion and for some purpose(s) that something happened" (Phelan & Rabinowitz, 2012, p. 3). Narratives are seen as purpose-driven communication that seeks to accomplish some goal (Phelan & Rabinowitz, 2012), such as teaching a lesson or changing behavior. Several scholars, including Braddock and Dillard (2016), have researched the rhetorical value of narrative and determined that stories are an effective persuasive messaging tool. This concept is apparent in stories with moral messages like those seen in Al Gore's *An Inconvenient Truth* regarding climate change; *The Boy Who Cried Wolf*, which aims to persuade children not to lie; or in the teachings and parables of Jesus Christ (Chia, 2020; Fischer et al., 2020).

Beyond this rhetorical point of view, others have developed ways to understand how narrative works more as a system to create meanings for individuals. Walter Fisher (1984) proposed his narrative theory as an alternative to traditional rhetoric and logical argument creation that had dominated the communication field. He posited that rationality and reasoning were not reliant on the logical argument alone but could be found through other means, including

"all sorts of symbolic action," which he believed were stories (Fisher, 1984, p. 1). Fisher thought

that people make decisions based on what he called "good reasons" that come from the

narratives that individuals engage in (Fisher, 1984, p. 2). He further contended that storytelling

must have *narrative probability*, meaning the story had to make sense, and *narrative fidelity*,

which meant the story must ring true and be accepted by those engaging with the story. Put

simply, individuals tell stories to rationalize their world, creating shared meaning and

understanding of actions and behaviors through communication (Fisher, 1984).

Fisher's (1984) narrative theory emphasizes stories' significant role in shaping and

influencing human communication. Fisher believed that stories were the primary way human

beings constructed their realities, understood the world, and created shared meaning. Through

stories, people create personal cultures or worldviews, influencing their interactions with others.

Several scholars have researched narrative as an educational resource and found it is an effective

way to share knowledge and influence behavior (Fraser, 2020; Humpherys & Babb, 2020;

Landrum et al., 2019). Fisher believed storytelling was at the core of human existence. It may be

the oldest form of oral communication, through which people pass their cultures and history

down to the next generations (Ong, 1982/2002). Hangar flying is a context-specific kind of

storytelling shared by those in aviation (Emblem, 1975; Harrison, 2021; Kruschwitz & Roth,

1999; Vandenputte, 2021).

The strength of this theory lies in its multiple ways to function, explore, and expound on

the human condition. The numerous functions that Sharf et al. (2011) discovered when analyzing

narratives dealing with health and illness apply to many other contexts where narrative is

present. Sharf et al. said that narratives function to make sense of situations, assert control, create

community, transform identities, justify decisions, and humanize experiences. At the heart of this

theory is that the human being is a natural storyteller and uses stories as a primary way of

communicating with others (Fisher, 1984). Fisher (1985) later pointed out that stories can also

provide a rationale for decisions that may influence an individual's future behaviors. Thus, the

motive of a story or storyteller is also essential to consider in how individuals use narratives to

communicate and construct reality.

Narrative theory is connected to several other concepts of note for this research study,

including *transportation* and *identification* (Humpherys & Babb, 2020). Transportation explains

how a reader or listener can be so engrossed in or transported into a story that they lose track of

time and space while being influenced by the story's events (Green & Brock, 2000). Here, the

narrative plays a role in the cognitive processes of the reader or listener, influencing actions or

emotions (Bandura, 2006). Busselle and Bilandzic (2009) discussed how individuals can identify

with characters in a story to an extent where the reader or listener adopts the same perspective as

the character, thus influencing their actions or beliefs. One other concept that connects to

narrative and the research's goal is symbolic convergence, which explains storytelling's

importance in building and sustaining groups of people and cultures (Bormann, 1982).

### *Criticisms of Narrative Theory*

Narratives are often seen as subjective and lacking in scientific basis, thus making them

less credible in some contexts (Barbour et al., 2016). Narrative theory is grounded in the idea

that humans are storytellers. Therefore, the stories are subjective, can change, and may not be

helpful in building professional arguments. Barbour and colleagues furthered that stories are

great ways to raise awareness of a topic or issue but often fall short of providing solutions to a

problem, making them less valuable. The subjectiveness of storytelling may lead to exaggerating

details and creating a tall tale, which listeners may perceive as deception, causing mistrust

(Caron, 1986). Even Fisher (1984, 1985) understood that the storyteller determines the story's effectiveness and that some stories are of higher quality than others. Some are truer and more engaging, logical, and coherent than others. Unfortunately, hangar flying has had a reputation for telling tall tales for entertainment, even though there is much educational and constructive content offered by the practice (Harrison, 2021; Vandenputte, 2021).

**Cultivation Theory**

In the late 1960s, George Gerbner began to recognize the power and danger of television and its domination as an entertainment medium in American culture. He was most concerned that the type of mass-mediated, industrially controlled storytelling television presented was laden with violence and fear, potentially distorting individuals' view of the world and cultivating or developing a fearful attitude towards everything and everyone (Romer et al., 2014). Gerbner believed that heavy television viewing could fundamentally alter the perceptions of the culture due to its pervasive nature. He remarked that television was now so present in people's lives that individuals learned to watch television even before they knew how to talk (Gerbner & Gross, 1976). Television was an invisible member of the family that became the primary source of socialization and information in American culture, shaping viewpoints, norms, and morality in ways never seen before (Gerbner et al., 1986). Before television, one needed a level of literacy, social class, and access to learn information through the print mediums of the day, but with those barriers removed, learning could take place simply by viewing others on a screen, performing actions, or telling stories.

Romer et al. (2014) stated that cultivation theory was one of the most cited theories in communication research explaining how media influences society. Utilizing cultivation theory, Hoffman et al. (2023) identified 165 studies that examined the influence of health storylines on

fictional television programs on viewers' health-related outcomes. They discovered that exposure

to health stories, even if the stories were fictional, cultivated particular views of health issues,

healthcare workers, and health behaviors. The researchers shared the example of the Netflix

program *13 Reasons Why,* which depicted graphic suicide attempts and noted evidence

suggesting that viewers of the program cultivated suicidal thoughts and self-injurious behavior.

Additionally, Chung (2014) found that heavy viewers of medical dramas that regularly featured

death from cancer were more likely to have a skewed perception of cancer mortality and survival

rates than non-viewers.

Wang et al. (2016) experimented to determine if media exposure to news of an airline

crash would cultivate feelings of anxiety. Two groups of individuals were chosen, with one

watching television news footage of an airline crash while the other watched airline television

commercials. The researchers found that none of the participants exhibited high anxiety levels

during each situation. Still, there was evidence to suggest that anxiety levels increased after

watching the crash video. Those who watched the airline commercials reported favorable views

of air travel. The results showed that viewers cultivated both positive and negative opinions of

air travel, illustrating the mass media's influence on the general public whenever there is an

aviation accident.

Gerbner (1969) was concerned with the influence of television programs of the 1960s,

which seemed to invade the American culture and alter perceptions. However, a recent study by

the Pew Research Center shows that social and digital media sources may be far more influential

than television was in Gerbner's day. The study found that over 80% of Americans get their

news from digital media sources, including social media (Shearer, 2021). Building on Gerbner's

cultivation theory, Hermann et al. (2020) posited that Facebook and other social media provided

environments where stories and values could be conveyed. Specifically, their study focused on how Facebook use cultivated attitudes towards ethnic minorities in Germany. Using an online questionnaire, the researchers polled undergraduate students to estimate their Facebook use and attitudes toward minorities. They found that with their participants, high Facebook use was associated with cultivating positive attitudes towards minorities, which contrasted with prior research. Hence, they concluded that social media platforms can be used to share stories and information that produce positive outcomes in the culture.

A different study led by Hermann et al. (2023) looked at the effects of social media in cultivating worldviews through a meta-analysis of existing research. The researchers posited that cultivation theory was based on how media contributed to a homogenization of viewpoints in the culture through heavy television exposure. However, given that social media messages are far more fragmented and individualized, they were unsure if individuals would still cultivate values or norms from them. Hermann et al. (2023) discovered that social media does have a cultivating effect on users, especially as usage increases. Further, they proposed that particular social media platforms may cultivate specific views or assumptions from users. Given social media's pervasiveness and global reach today, the researchers suggested that a revised version of cultivation theory that addresses social media's effects on enculturation may emerge (Hermann et al., 2023).

In a study of makeup tutorials on YouTube, Chae (2021) found that postfeminist beliefs in young females were often reinforced through frequent viewing of the content. Learning how to enhance one's appearance was seen as a mark of individualism and empowerment, and young women who watched these videos were more likely to be shaped by these beliefs. Chae's work focused not only on cultivation theory but also on social cognitive theory, as the beliefs and

behaviors the young women cultivated came from observing other young women in the video

content. This point is important as it supports this research study's assertion that these theories

and narrative theory are connected and serve to inform one another. As YouTube offers

favorable conditions for the observational learning process through mediated content, one can

infer that pilots who view videos containing hangar flying stories may cultivate various beliefs or

personal cultures regarding flying, just as the young females did from makeup tutorial videos.

*Criticisms of Cultivation Theory*

Cultivation theory is often criticized for the assumption that all television or media

consumption can lead to fearful attitudes about the world rather than looking at particular genres

or programs (Moyer-Gusé et al., 2008). The theory may also assume that television viewers are

consumers of violent television only or that social media users only read one type of post, which

is not likely. Moyer-Gusé and colleagues et al. also found criticism of the theory saying it does

not consider various individual perceptions of the mediums, nor how viewers living in areas with

varying crime rates may perceive the television stories and what they may cultivate from them

based on their unique perspectives.

An aspect of cultivation theory that is important to the research is the role of stories in

cultural development. Gerbner (1990) focused on the role of stories in enculturation, or the

gradual adoption of norms and values as one becomes part of or develops a culture. Gerbner

thought stories in all forms, whether fairy tales or religious parables, were messages that could

communicate roles, norms, values, and priorities in a culture (Gerbner, 1990). Gerbner thought

that whatever people viewed on television the most would influence their knowledge and

attitudes toward the world around them. However, today, individuals have many sources of

information through which they may be enculturated both in traditional and digital formats

(Shearer, 2021).

**Theoretical Connections to the Research Study**

This research used cultivation theory, social learning, social cognitive, and narrative

theories as guiding perspectives to investigate the content of digital hangar flying stories found in

online videos, and to explore how these stories may influence the learning experiences of general

aviation pilots and their cultivation of their personal flying culture. These theories support and

connect in that narrative theory is at work in the stories themselves, social learning and social

cognitive theories in the vicarious learning the narratives provide, and cultivation is seen in how

the stories influence the pilot's view of aviation. In other words, pilots engage in hangar flying

stories, learn from them, and choose how to react to the learning, and this process shapes the

kind of pilot they become and the kind of future hangar flying content they consume. For

example, if they heavily consume hangar flying messages focused on risk mitigation, they may

cultivate flying cultures and beliefs focused on safety.

**Related Literature**

This qualitative study explored hangar flying as a communication practice for vicarious

learning in the broad development of general aviation pilots' personal flying cultures. Since few

scholarly studies have been conducted concerning hangar flying, a broader approach was taken

to reviewing the literature relevant to the current research study. Therefore, this section reviews

the literature to understand general aviation pilots and the deficiencies in their training. The

focus then turns to hangar flying as a storytelling tool, a means for vicarious learning, and an

influencer of a pilot's flying culture. The goal is to share literature that will help the reader be

more informed on the topic and illustrate a gap in the current literature that this study fills.

**Understanding General Aviation Pilots**

As mentioned in Chapter 1, most general aviation pilots are not professionally employed as pilots and fly for recreation or business. However, 80% of pilots in the United States fly general aviation aircraft (Aircraft Owners & Pilots Association, n.d.-a). Determining who these pilots are would better inform the study and give some insight into their flying perspectives. This research explored how general aviation pilots vicariously learn through hangar flying and how those narratives may influence their personal flying culture. A glimpse into the literature that describes average general aviation pilots and their typical personality traits provides helpful information.

*Demographics*

The primary certification held by most general aviation pilots is that of *private pilot*. As of 2022, there were 435,000 individuals holding at least a private pilot certificate in the United States, with 164,090 holding that certificate alone (Federal Aviation Administration, 2022). The FAA estimates that 8% (12,831) of those private pilots are women, comprising less than 10% of the entire pilot population. The largest single group of private pilots is between the ages of 20-24; however, the average age for a private pilot is 47.4 as of 2022 (FAA, 2022). Most private pilots are white (81.7%), and nearly 67% of pilots hold at least a bachelor's degree (Zippia, 2021). Beyond these demographics, some scholars have written about the type of person a general aviation pilot is.

*Personality Traits*

Chaparro et al. (2020) researched personality characteristics of the current pilot population, providing the current study with insight into the kind of people who engage in aviation and hangar flying and why they might do so. The researchers found that most pilots

exhibited low levels of neuroticism and agreeableness. They also found that most pilots have

high levels of externally motivated extraversion and a drive for accomplishment. Additionally,

research from Breuer et al. (2023) shows that pilots tend to have more self-confidence in their

abilities and openness to learn new ways of doing things, connecting to Bandura's (1986)

concept of high self-efficacy being a factor in social learning. Although this research did echo

the findings of Chaparro et al. (2020) in that pilots are generally more extroverted, open, and

motivated, their study did not necessarily support these as factors of a pilot's success in aviation

training.

Craig (2013) wrote that safe pilots were mature, achievement-driven, curious, and able to

cope with challenging situations. His work focused on why pilots are often the cause of aviation

accidents and concluded that in addition to a lack of experience, the pilot's personality may also

be a factor. He further noted that pilots were driven by the achievement of challenging tasks as

they needed personal rewards. However, this trait might also cause pilots to attempt flying in

unsafe situations just to prove they could. Craig also claimed that pilots seek recognition for their

accomplishments, have a need for dominance, and often seek adventure and exhibition. He

pointed out that these traits, while typical, may also be traits that can lead to overconfidence,

arrogance, and reckless behavior, leading to accidents. This point is essential to better understand

pilots' underlying reasons for hangar flying, the kind of stories they curate, and what personal

flying culture they ultimately create.

**General Aviation Flight Training Deficiencies**

Several studies have described deficiencies in formal general aviation pilot training

related to a lack of real-world or authentic scenario-based training (Boyd, 2023; Major et al.,

2017; Whitehurst et al., 2019). Unfortunately, these deficiencies can lead to increased accident

rates and fatal injuries. The National Transportation Safety Board reported that in 2021, there were 1,156 general aviation accidents, 210 of which resulted in fatal injuries to 344 individuals. Over half of all general aviation accidents are caused by pilot error due to inadequate or improper training and a lack of experience (Pilot Institute, 2023). Some have suggested that the way to remedy pilot error is with more formal training, computer simulations, more regulations, or additional technologies in the cockpit (Fuentes & Chung, 2023; Harnagel, 2021; Wildes, 2021), but they have neglected the viability of informal methods, like storytelling.

Major et al. (2017) discovered that general aviation pilots in their study believed they received enough training to pass the checkride. However, they admitted that their overall flight education was deficient, especially in handling adverse weather conditions. The pilots also revealed that they do not engage in formal ongoing training after earning their private pilot certificate. Boyd (2023) also found weaknesses in formal general aviation training in the area of handling hazardous weather and flight situations. He called for more recurrent training as well as alternative methods of education. Boyd also suggested in-depth interviews with pilots to learn why they might take risks and fly in hazardous conditions when they are not trained well for it.

In professional aviation, airline pilots must participate in recurrent training more frequently than general aviation pilots, often every 6 to 9 months (Hoke, 2018). This training may take several days and require flying with an instructor, logging a set number of hours in a flight simulator, and classroom reviews. However, general aviation pilots are only required to pass a flight review with a flight instructor every 24 calendar months, which consists of 1 hr of ground instruction and 1 hr of flight instruction (Subpart A–Flight Review, 14 CFR 61.56, 2023). Ongoing or other recurrent training is not required for general aviation pilots. Since it is not required, it is likely that many pilots do not engage in any training practices other than preparing

for flight reviews every 2 years. This lack of training may lead to diminishing skill sets and further deficiencies.

In addition to deficiencies in training, the minimum hourly requirements to become a private pilot in the United States may also not provide adequate time to gain real-world experiences. The Federal Aviation Administration (n.d.-a) states that the minimum requirement is 40 hr of training for a private pilot certificate, but the national average is closer to 75 hr. Aviation educator and pilot Paul Craig (2013) conducted a study that presented evidence for what he called the *killing zone*, a range of total flight experience between 50-350 hr, which he linked to most general aviation accidents with fatalities. Craig posited that this band of time was when pilots faced the most significant risk due to lack of experience and skill, as most are newly minted pilots and have not had the education or opportunity to handle challenging flight operations. Research from Knecht (2015) supported Craig's conclusions but added that the total flight hours range could be 2,000 or greater before accident rates truly plateau. Both authors concluded that accident rates were higher for those pilots in the early days of their careers, post-certification, due to lack of education or experience but declined as flight hours increased.

**The Need for Alternative Education for General Aviation Pilots**

Chui et al. (2021) posited that flight training has not changed significantly in the last 30 years and cited the need to explore non-traditional approaches to aviation education. Cohn (1994) also wrote that flight training remained little more than a "crash course in not crashing" (p. ix). Cohn's book explored the vast real-world scenarios not included in his pilot training, including using oxygen, dealing with icing, spatial disorientation, or optical illusions. The author recounted true tales of aviation accidents that were attributed to pilot error and caused by

inexperience, lack of training, or ignorance. Like Chui and colleagues, Cohn alludes to the need

for a different kind of training to enhance the formal training pilots receive.

Steve Krog (2022) wrote in the *Hangar Flying* blog of the Experimental Aircraft

Association that initial pilot training today seems little more than preparing students to pass a test

and is not focused on building confidence or proficiency. In some informal hangar flying visits

with young pilot instructors, Krog discovered that students are pushed through programs with

little extra time to spare for building proficiency or improving weak skills. The author expressed

his concern that this mindset would produce generations of mediocre, inexperienced pilots,

which are potentially dangerous. While Krog does not offer any specific solution, he concludes

that this trend cannot continue and that pilots and students must learn more about flying than just

how to pass a test. Another key study supporting the current study is found in Harnagel's (2021)

work, which found that pilot proficiency is the key to reducing general aviation accidents and

suggested that more resources must be provided. Like Krog (2022), Chui et al. (2021), and Cohn

(1994), Harnagel strongly urged that alternative methods be developed for pilots to gain and

maintain their skills. They suggested that a possibility could be learning from the stories and

experiences of other pilots via general aviation print materials like *Flying* magazine's "I Learned

About Flying From That" series (*Flying*, n.d.). Additionally, Harnagel specifically mentioned

that pilots can build proficiency beyond their formal training by using scenario-based training,

which is often based on the stories and experiences of other pilots.

### Scenario (Story) Based Training

One method of aviation training with elements of storytelling and hangar flying within it

is called *scenario-based training*. Scenario-based training is a formal training system developed

by the Federal Aviation Administration (FAA) that uses real-world experiences or scenarios to

meet flight training objectives (FAA, 2007). This training is designed to teach piloting skills in

scenarios that mimic the kind of real-world flying that pilots will actually do. For example, in

learning cross-country flying, pilots might plan a trip to a fly-in at an airport 100 miles away.

The FAA believed that a more accurate evaluation of their risk management and decision-

making skills could be taken by assessing pilots' skills during scenario-based training. As this

training was optional, it is unclear how many general aviation flight schools may have integrated

this training into their curriculums. For example, the researcher did not receive any kind of

scenario-based training when learning to fly, illustrating that not all instructors use the method.

Andrews et al. (2009) provided research that indicated scenario-based training was a type

of storytelling-based instruction. The author describes scenario-based stories and training as

being used in the military to help develop battlefield strategies. More aligned with the case-based

kind of storytelling (Chappell et al., 1997), scenario-based training does contain elements of

story design and may be based on some real-life event, situation, or mission (Federal Aviation

Administration, 2007). Jentsch et al. (1997) suggested that stories might be used as sources of

mental practice exercises, which could be scenarios one reenacts in the aircraft during flight.

Using stories and experiences as the basis of scenario-based training is also supported by Myers'

(2022) research with flight nurses on air transport crews. The nurses often used past experiences

and stories to create educational programs that recreated scenarios for other nurses or medical

professionals. This concept is interesting in considering how hangar flying sessions might help

pilots create scenario or story-based missions or training to hone their skills.

**Storytelling**

Storytelling is as ancient as human beings, intertwined with their very nature and present

in much of the communication that takes place between them (Wiessner, 2014). Stories and

storytelling have existed since humans first began to create language and communicate with one

another (Clair et al., 2014). In those early days, humans' primary form of recording history was

through oral storytelling passed down from generation to generation (Ong, 1982/2002). From the

days of Aristotle to 20th-century philosophers like Kenneth Burke, who studied narrative from a

literary criticism perspective, many scholars have understood that narrative gives "meaning to

our lives" (Clair et al., 2014, p. 3).

There is also science that supports the power of storytelling. Research shows that when a

person is telling a story, and another is listening, a neural link is formed in which each shares the

experience with the other, creating a powerful force for teaching and understanding (Gallo,

2019). Will Storr's book, *The Science of Storytelling* (2020), discusses how the human brain is

wired to understand the world through stories. He described a region of the brain called the

neocortex, which scientists believe helps interpret facial expressions and gestures and is

responsible for planning, reasoning, and making connections between thoughts (Storr, 2020). He

argued that this is why, when asked to explain a complex idea or thought, like love or freedom,

humans use stories to simplify and make sense of the idea. In addition, Stephens et al. (2010)

conducted brain scans of individuals telling and listening to stories and discovered that while

engaged in the story, there was what they called *neural coupling* between the speaker and the

listener or similar activity in the same areas of the brain. In other words, when engaged in the

narrative, both the speaker's and the listener's brain activity mirror each other, showing a

connection to each other and the story's events. When humans share this connection, there is a

higher degree of comprehension of information, leading to a better understanding of concepts or

ideas and longer retention of information (Lerner et al., 2011).

### *Storytelling as a Learning Tool*

This current study on hangar flying posits that storytelling can be a vicarious educational tool for pilots. Though often an informal form of education, stories can impart knowledge and contextualize learning through tales of real-world experiences (Dunn & Reed, 2020). Landrum et al. (2019) argued that storytelling may be foundational to the learning process, no matter the subject. They further contended that stories allow for a "purposeful introduction of complexity," and placing a concept within a real-world context can increase comprehension and understanding for the student (Landrum et al., 2019, p. 250). While these researchers were working in the field of psychology, others have shown the use of stories in other disciplines. Bell (2009) used storytelling to educate students about racism and social justice in middle and high school settings, while Mutonyi (2016) explored how stories could improve high school students' comprehension of science. Austin et al. (2016) examined the use of storytelling to help information technology (IT) students understand such concepts as security, managing an IT department, and working with vendors. They discovered that using stories to illustrate concepts was enjoyable to the students and helped them succeed.

Research from Zazkis and Liljedahl (2009) supports that creating meaning should be the central thread to teaching, engaging students to think through and understand complex concepts. Their research focused on the use of storytelling to help students in mathematics classes solve equations and other mathematical problems, creating a better understanding of the how and why of the problem. For example, an instructor could teach various concepts or simply make connections to ideas by telling the story of Archimedes, who died while still intently studying a mathematical diagram, or the origin of the decimal point, or how Pythagoras came up with that famous theorem (Zazkis & Liljedahl, 2009).

Further learning benefits of storytelling are outlined by Hopfer (2012), who listed five

outcomes of storytelling as a tool for conveying information. These are the ability of the story to

a) overcome resistance in the listener or reader, b) engage less interested audiences, c) engage

audiences with less knowledge on a subject, d) make complex information easier to understand,

and e) culturally ground the topic to the target audience. These benefits were also seen in

Humpherys and Babb's (2020) study regarding fable-based storytelling in assessment exams.

They determined that "stories can be leveraged to reduce resistance to learning and help the

learner interpret experiences in the story to their own problem-solving experiences" (p. 7), which

helps them complete the exam more successfully. In addition to higher scores, students reported

enjoying the exam process much more than with previous tests. One student even remarked,

"That was the most fun exam I have ever taken" (Humpherys & Babb, 2020, p. 7).

### *Digital Storytelling as a Learning Tool*

Recently, researchers have been studying narratives in connection with new technologies,

creating the concept of digital storytelling (Chan & Sage, 2019; Choo et al., 2020; Nair & Yunus,

2021). Digital storytelling incorporates videos, graphics, text, audio, and animations to tell

stories as opposed to traditional oral modes (Chan & Sage, 2019; Choo et al., 2020). These

stories are often found on online platforms such as YouTube. For example, the Air Safety

Institute creates videos of authentic pilot stories focused on increasing safety in aviation (Air

Safety Institute, n.d.-b). Additionally, digital stories like those found on platforms such as

YouTube are usually short, easily viewed on multiple devices, and simplistic to understand by a

large variety of audiences (Nair & Yunus, 2021).

Research by Sui et al. (2022) concluded that YouTube's ability to foster connections

between content creators and viewers makes it a valuable tool for communication, interaction,

and engagement. Sui et al. also discussed the value of YouTube as a data source for studying various phenomena, like hangar flying, from investigating content themes to the sentiment of the viewers in the comments. Patterson (2018) discovered the depth of information that YouTube videos offer, specifically in the intimacy shown in the viewer's comments. Patterson found that individuals often share much more information online than they might elsewhere, concluding that this level of sharing may rival that of in-person interviews.

Chan and Sage's (2019) research, which focused on the social work profession, concluded that digital stories were a beneficial tool for education and building community strength for multiple disciplines. They, like Patterson (2018), suggested that digital storytelling offers advantages over face-to-face interactions, allowing a listener to reflect on the information without the need to give instant feedback. Choo et al. (2020) concluded that digital storytelling is especially effective at catering to multiple student learning styles as it combines visual and auditory learning. The researchers also found that digital storytelling benefits teachers and students more than traditional oral narrative methods (Choo et al., 2020). Moghavvemi et al. (2018) found that many university students rely on YouTube videos to solve academic problems and seek information about topics unknown to them. They further posited that more institutions of higher learning are seeing the benefits of YouTube videos as a pedagogical tool in the classroom and that many of these videos are presented in a storytelling form. Reinforcing this study, the authors concluded that video stories can help people learn something new or reinforce existing ideas.

Using YouTube and other social media platforms for digital storytelling allows stories to be told from multiple perspectives and in various ways (Musfira et al., 2022). These researchers also posited that social media is used more for educational purposes and is an effective strategy

for telling stories that enhance learning. Yeh and Mitric (2019) discovered that Instagram could be used in a college-level English as a Second Language (ESL) class for sharing students' stories and their classwork beyond the classroom. This storytelling via social media increased student engagement in both speaking and writing and their participation in the larger online culture. Zammit et al. (2016) also investigated social media and video-sharing tools for capturing and sharing specialized employee knowledge, a method that proved effective and allowed the authors to develop a model that could be implemented in organizations.

Aligning with the qualitative content analysis method used in this study, Hou et al. (2016) investigated the promotional videos used by the ten major tourist destinations in China, analyzed their content for specific elements of tourism, and found that the elements were not evenly balanced, resulting in skewed perspectives of the destinations. Additionally, Yoo and Kim (2012) studied how topics of obesity are framed in YouTube video clips exploring themes found in their content analysis, finding that the videos influence the viewer's perceptions about obese persons and often reinforce the negative stigma around them. Andriopoulou et al. (2022) investigated video storytelling and practical experiences as informal instructional tools for high school students studying the environmental issue of marine pollution. They discovered that video storytelling raised awareness of the issues and was an ideal tool for scientific education and environmental literacy. Students reported that they enjoyed the process of learning about science through stories. Furthermore, Andriopoulou et al. concluded that this kind of informal education contributed to the cultivation of student's desire to learn about science and environmental issues. Though this was a relatively small study, it lends credibility to storytelling being a valuable informal educational tool that can positively contribute to a person's overall view of a topic and shape their development.

### Storytelling as Indirect Communication

Storytelling is also a form of indirect communication whereby information is transmitted implicitly rather than explicitly through more direct means (Fraser, 2020). Fraser studied the work of Søren Kierkegaard, a Danish theologian and philosopher of the 1800s, who believed that indirect communication moved individuals beyond simple belief to action and the formation of habits and behaviors. Fraser focused on using indirect communication strategies to share the gospel message of Jesus Christ with cultures that are reluctant to hear the truth directly. He argued that God's message was originally delivered to a people with an oral culture who shared it successfully with others via storytelling, but this way had been lost and neglected in favor of more direct communication tactics, which he concluded were not as effective in sharing the Gospel. He used C.S. Lewis's *Chronicles of Narnia* as an example of how Christian messages and teachings could be shared indirectly via allegory and symbolism.

Jesus himself communicated indirectly and often told stories or parables to help His followers better engage with, understand, and remember His teachings. Chia (2020) concluded that parables effectively influenced the perceptions and behaviors of Jesus' listeners. The parable of the mustard seed found in Matthew 13:31-32 or the parable of the sower in Matthew 13:24-30 are two examples (*English Standard Version Bible*, 2001/2016). Jesus used parables to teach His disciples the "knowledge of the secrets of the kingdom of heaven" so that they could better engage with, understand, and remember the secrets so they could be passed on to others (*English Standard Version Bible*, 2001/2016, Matthew 13:11-13). Given that little was written down at the time, Jesus' stories had to resonate in the memory until they could be recorded.

Another important study connected to indirect communication and the concept of hangar flying is Taeger's (2020) work regarding narrative distance. Taeger defined narrative distance as

the "cognitive or emotional space afforded by indirect communication that invites listeners to make sense of content" (Taeger, 2020, p. 213). Taeger argued that the combination of storytelling and narrative distance can create transformative learning experiences without the need for direct messages. Whether a person reads, watches, or listens to a story, they usually must interpret the meaning of the narrative for themselves and must have time and space to make sense of it before they can make any decisions or alter actions based on it (Taeger, 2020). This concept is important to the research on hangar flying as it helps one understand how a pilot processes a hangar flying story, learns vicariously through it, and interprets its meaning for their future behaviors.

**Vicarious Learning**

Vicarious learning is a core element of social learning theory (Bandura & Walters, 1963; Bandura, 1971, 1977) and social cognitive theory (Bandura, 1986). Bandura's work showed that vicarious learning can occur through observing and consuming another's verbal and nonverbal communication, which may lead to alterations in behavior. The concept of vicarious learning has been explored in various contexts, but few examples were related to aviation. This section discusses those examples that inform and provide support for the research study.

Related to this research study, Myers (2022) qualitatively explored the use of storytelling for vicarious learning amongst flight crews in an air medical transport team, revealing the value of this communication tool for gaining knowledge and skills by sharing experiences. Myers constructed a conceptual model to explain how stories were the means by which the flight nurses converted their experiences into actionable knowledge to better respond to future situations and challenges. Although more focused on storytelling's effects on teams within organizations, the author's research supports the current study's purpose in exploring storytelling as a vicarious

learning tool. Flight nurses, like pilots, share stories of their experiences and learn from discursive storytelling interaction, "providing an opportunity to understand and draw lessons from that experience despite not having directly observed or participated in it" (Myers, 2022, p. 383). Myer's study informs the research on hangar flying by illustrating the use of storytelling to not only build culture or convey values but also to transfer knowledge and skills. Through interviews and ethnographic research, Myers found that the flight nurses found great value in sharing stories of their experiences transporting patients via helicopter and were able to gain knowledge that informed their future actions, decisions, and learning efforts. Like hangar flying, the stories enabled the nurses to add to their "mental toolkits" and gain new perspectives and reassurance in dealing with challenges (p. 399). Additionally, Myers also discovered that the extant literature was limited in its view of storytelling as a tool for vicarious learning, of which their research helped close a gap. In an earlier work concerning vicarious learning, Myers (2018) noted that more research was needed to understand how storytelling interactions affect future tasks undertaken by those in the exchange and how different contexts may influence the impact of what is learned and retained.

Exploring those other contexts in relation to vicarious learning, Rae (2005) studied how the narratives of three entrepreneurs' career journeys could teach future entrepreneurs. Rae found there was potential to create a learning model based on sharing these experiences. Rae concluded that much of entrepreneurship education is learned experientially from others, suggesting there is great value in observing, listening, and sharing the stories of others. In a similar study, Chavoushi et al. (2020) paired experienced entrepreneurs with college-aged student entrepreneurs in a mentoring relationship, in which the mentors shared advice and narrative experiences with the students. They discovered that the young students learned vicariously

through their mentors' sharing of experiences with them and through observations. Chavoushi

and his colleagues' work supports the current study's focus on hangar flying, providing evidence

of vicarious learning through another person's experience. These experiential learning

interactions involved the mentors sharing their experiences with the students, just as pilots share

their experiences with others via stories. Alvarado et al. (2020) also studied entrepreneurship and

vicarious learning and discovered that students in an entrepreneurship education class reported

benefiting from listening to the stories of failures of other entrepreneurs. Through consuming

these failure stories, the students learned what mistakes to avoid in their own business endeavors.

The literature implies that this concept of vicariously learning from the failure or mistakes of

others can be applied to other fields. Pilots may be able to learn from stories of other pilots'

mistakes, thus helping them avoid similar situations in their flying endeavors.

Finally, Horsburgh and Ippolito (2018) conducted qualitative research with medical

students and their teachers focused on modeling and imitation via vicarious learning. Semi-

structured interviews with final-year medical students indicated that observing more experienced

physicians perform tasks was beneficial and helped them gain new understanding, skills, and

behaviors (Horsburgh & Ippolito, 2018). The participants also said they learned vicariously from

listening to the physicians' prior experiences and stories. While not explicitly focused on the

influence of narratives on learning, this study noted both visual and auditory observational

learning, which included listening to the experiences of their mentors.

Vicarious learning, as originally posited by Bandura and Walters (1963), asserted that

learning could occur through observation of others' behaviors and did not explicitly explore

other modes, such as reading about others' behaviors or listening to stories of their experiences.

However, much of the literature on vicarious learning mentioned in this section shows that

vicarious learning is attainable through sharing stories and listening to others' experiences. This literature and that of others like Mayes (2015), who studied how vicarious learning can occur through dialogues, illustrate that vicarious learning can extend beyond mere observation of behavior to include various communication channels.

**Hangar Flying**

The central focus of this academic work was to explore a communication practice among general aviation pilots. Within aviation, stories are shared between individuals in an act known as *hangar flying* (Harrison, 2021). The term refers to sharing flying experiences while sitting or standing in an aircraft hangar, although the act is not limited to a specific setting. Hangar flying can occur in the hangar, around a table, in person, in print, or online through social media, YouTube, and podcasts. As Harrison noted, the practice can be full of truth or contain only shreds of it, serving to be educational and entertaining, whether it is based on fact or fiction. Hangar flying is a well-known form of storytelling amongst pilots and aviation enthusiasts but has not been written about extensively until now. However, some have tried to offer explanations of the communication phenomenon.

*Possible Origins*

Meyer (2015) wrote that the term *hangar flying* appeared in aviation periodicals in the late 1920s as a common phrase for talking about airplanes in an aircraft hangar waiting for bad weather to clear. However, hangar flying may have been occurring orally long before the 1920s. Edwards (2009) found that hangar flying occurred amongst the earliest fliers at Orville and Wilbur Wright's flight school between 1910 and 1916. His research into the history of the Wright brothers' short-lived flying school revealed that these were often informal conferences between instructors and the students regarding the student's "aerial transgressions" during

training (p. 9). Edwards' research found that many of these discussions were to debrief after a day's lesson and the Wright brothers often attended. Another of the earliest mentions of hangar flying is a 1941 article in the *Journal of Consulting Psychology*. The article discusses a project where psychologists were trained in piloting to evaluate potential aviators on their mental fitness to fly (Jenkins, 1941). Jenkins wrote that in 1941, aircraft were being used in modern warfare and were predicted to see much more use. There was a growing concern that as the aircraft's performance increased, pilots must have the physical and mental aptitude to handle the various stresses climbs, dives, and aerial combat might place on them. The author noted the psychologists-turned-pilots spent hours hangar flying, building "intimate knowledge of the skills and vocabulary of flying," which better enabled their work in assessing the future military pilots (Jenkins, 1941, p. 231).

Media has been a vessel of hangar flying from the early days of aviation. As Meyer (2015) found, aviation stories began to surface in printed articles in the late 1920s and reached a larger population than those just at the local airport. Aviation magazines formalized hangar flying stories in print with *Flying* magazine's column titled, "I Learned About Flying from That!" which has been a popular feature since 1939 and is now available in a podcast version (Godlewski, 2022). In 1958, the Aircraft Owners and Pilots Association (AOPA) launched a monthly column in its *AOPA Pilot* Magazine titled "Never Again," which shared lessons learned from piloting mistakes (AOPA, 2008). Both of these print-based features have now evolved into digital formats of hangar flying.

### Criticisms of Hangar Flying

In the early days of flying, hangar flying sessions at the local airport drew some criticism as some thought these jovial storytelling gatherings promoted a negative view of aviation. In

1949, R.E. Dutton of the Cessna Aircraft Company warned that tall tales of dangerous flying

were bad for selling airplanes and promoting flying lessons (Meyer, 2015). The critics perceived

that most hangar flying was spinning tall tales and fiction, which would scare potential pilots and

create the perception that flight was too risky. Richard Collins, the long-time editor and writer

for *Flying* magazine and later *Air Facts Journal,* said that non-aviators may have poor

perceptions of pilots because of the fictions that some have told during hangar flying sessions.

He acknowledged that pilots love to tell stories, which is one of the most cherished privileges in

aviation, but perhaps the tales should only be shared amongst themselves (Collins, 1969).

Despite the criticism, hangar flying became an accepted forum for socializing, sharing

information, and educating new pilots (Meyer, 2015).

### *Hangar Flying as Entertainment and Education*

Harrison (2021) provides a humorous but valuable description of the concept of hangar

flying. He gives several examples of this kind of storytelling as a device for entertainment and

education among pilots. As Harrison noted, these stories can range from fantastical and

exaggerated to stories of real situations that teach valuable lessons to those listening. While he

advocated hangar flying for its entertainment value, he also concluded that "it may even become

educational" (Harrison, 2021, para. 16). There is also an allusion to hangar flying building and

maintaining the culture of aviation through fellowship with other pilots, enjoying laughs and

sharing stories of their flying exploits. Harrison showed that in most cases, an optimistic view is

cultivated from most hangar flying, even if the story is mostly fiction.

Meyer (2015) believed that hangar flying was an enjoyable rite of passage and played a

vital role in the informal education of pilots. Meyer discussed a kind of information conveyed

through hangar flying that was both educational and entertaining. This information was known as

a flying aphorism. An aphorism is a "short clever saying that is intended to express a general

truth" (Cambridge University Press and Assessment, n.d.-b, para. 1). Markovich (2019) of

*Aviation Humor* offered these aphorisms:

1. Every takeoff is optional. Every landing is mandatory.

2. There are old pilots, and there are bold pilots. However, there are no old, bold
   pilots.

3. It is always better to be down here wishing you were up there than up there
   wishing you were down here.

4. The only time you have too much fuel is when you are on fire.

5. Learn from the mistakes of others. You won't live long enough to make all of
   them yourself.

The last one connects well to Brown's (2018) concept of learning from older pilots via hangar

flying and to a possible reason other general aviation pilots engage in the practice. Meyer

mentioned that learning these aphorisms and the usually entertaining story that originated them,

along with learning other tricks of the trade, was part of the informal hangar flying experience

that pilots found so valuable.

Beyond aphorisms, hangar flying has provided other entertaining and valuable

information, such as the origins of rituals performed in general aviation. For example, it has been

a tradition in flight training that when student pilots complete their first solo, that is, flying alone

without the instructor on board the airplane, the instructor cuts off the student's shirt tail and

hangs it inside the airport office (Miculka, 2016). This rite of passage has been passed down for

generations of aviators, but no one knew where it originated. Thankfully, hangar flying fills that

gap. Pilot Charlie Gasmire of the YouTube Channel *Airplane Academy* offered that in the early

days of aviation, most training aircraft had tandem seating, meaning that the instructor would sit directly behind the student (Airplane Academy, 2019). Gasmire explained that long before radio communication, the instructor would get the student's attention by reaching forward and tugging on their shirt tail. They could indicate what they wanted them to do with varying degrees of tugs. Is this true? Maybe, maybe not, but it makes a good hangar flying story.

Although hangar flying may exaggerate or dramatize flying experiences, many stories can serve educational purposes, helping aviators learn information not found in formal flight training materials (Brown, 2018). Brown recounted how much of his informal aviation knowledge was gained from listening to the stories of older pilots at the airport on Saturday mornings. Vandenputte (2021) echoed this experience and added that these aviation stories shared with listeners are essential to building community and bonds amongst aviators. Vandenputte discussed how stories in aviation can inspire pilots to pursue adventure, learn new skills, and encourage the imagination. The author feared that traditional hangar flying—that is, aviators sitting around the airport sharing stories orally—might be a dying art form as he has observed that pilots often just show up and fly an airplane and then go home without stopping to chat with anyone. He advocated that pilots continue the tradition, go to the airport, share stories, and keep hangar flying alive. He noted that hangar flying can be motivational to those learning to fly and is important in the overall culture of the aviation community. While anecdotal, his personal account of how hangar flying and aviation have impacted him gives insight into this research study concerning how this storytelling communication can affect one's culture.

### Hangar Flying as a Learning Tool

Casner (2010) referenced hangar flying as a type of social learning, stating that much of what a pilot learns is not taught in books but learned via listening to other pilots' and instructors'

experiences. Casner's work supported hangar flying as a vicarious learning tool, aligning with

Bandura's (1977) social learning theory, which is one of the theoretical frameworks of this study.

Additionally, an important consideration for the research was Casner's conclusion that

information-sharing practices—like hangar flying—are changing due to the advances of social

media, blogging, and computer-based instruction. The advantage of social media is that pilots

and students can share information rapidly anywhere. Casner's assertion that few researchers

have studied social learning through hangar flying was also of interest in the current study. The

author also suggested more research be conducted on human factors in general aviation training,

including social learning and cultural issues, to improve pilot decision-making.

Chappell et al. (1997) concluded that hangar flying was a form of "case-based" teaching

using storytelling. The authors shared that stories describe memorable situations and the

consequences of the situation. Giving further support for this hangar flying research, Chappell et

al. claimed that training systems that utilize story-based approaches may be successful in sharing

valuable knowledge. In an example of this case-based type of teaching, Wildes (2021) modeled

hangar flying in his work by sharing a story of an accident, offering analysis, and pointing out

the need to combat pilot complacency with new methods to reduce future accidents.

Finally, Kearns and Sutton (2013) used hangar flying as a research tool to gather data on

general aviation pilots' perceptions of their training with threats and errors. The authors

developed a self-report survey called the Hangar Talk Survey (HTS), which was used to gather

narrative descriptions of the threats and errors that general aviation pilots encountered during the

hour-building phase of their flight training. The pilots' stories provided context that supported

learning and offered insight into the general aviation pilot's decision-making processes and

emotional states. The researchers discovered that by gathering the narrative accounts of the

pilots, there was more breadth and depth in the information gained than in other studies that used only observation to assess pilots' threat and error management. The hangar talk survey provided richer, thicker descriptions of the pilots' viewpoints, allowing them to expound on the questions with their personal stories and experiences. Kearns and Sutton also suggested using stories in future instructional techniques to develop general aviation pilots' nontechnical skills like communication and risk management. These scholars' study shows that there is much information and insight to be gained from these kinds of hangar flying narratives.

### Hangar Flying as a Mental Flight Simulator

Hangar flying stories may cause pilots to test out the scenarios they learned about while listening to them to prove or disprove them (Shanahan, 2020). This study is important as it illustrates that pilots are not always passive participants in hangar flying but choose to take action based on whatever narrative they have allowed to impact them. Similarly, Jentsch et al. (1997) found that pilots may use what they hear in hangar flying to create mental practice sessions to prepare for flight maneuvers. These sessions are performed outside of an aircraft in a method called *chair flying*, in which an individual sits in a chair, physically and mentally practicing operating the airplane in an imaginary scenario. This study shows that hangar flying can enable vicarious learning and cause individuals to take actions that increase their skill levels and knowledge. In the book *Made to Stick*, Chip and Dan Heath (2007) discuss how stories can prepare individuals for future decisions or situations they may encounter, and the authors even used an aviation reference when they mentioned that "hearing stories acts as a kind of mental flight simulator, preparing us to respond more quickly and effectively" (p. 18). The authors claimed that while listening to stories of scenarios is not the same as doing the actions in the scenario, it is the next best thing and is still effective at conveying knowledge to a person.

Vandenputte (2021) also noted that listening to these stories can be invaluable for student pilots learning how to operate an aircraft as they gain information beyond formal training books and lessons. Hangar flying was used in the United States Air Force to "debrief, compare notes, and analyze the day's events" of flying missions and operations with pilots (Kruschwitz & Roth, 1999). These hangar flying sessions were a friendly way to share the mishaps and triumphs of the day and learn from each other. According to Kruschwitz and Roth, the stories provided by pilots to others were a source of motivation and informal education.

Hangar flying can be useful for all those who fly, including those who teach others to do so. Work by Cross and Kiernan (2022) studied certificated flight instructors (CFI) ability to show resiliency and adaptation to their training and teaching environments. They found that CFIs learn formally and informally. They found CFIs reported that they learned much from an informal sharing of stories and experiences. Many instructors even said they could apply the knowledge they gained in these hangar flying sessions. Cross and Kiernan suggested that flight training organizations and CFIs build opportunities for hangar flying into their training curricula, as both teacher and student could benefit. Cross and Kiernan's work shows that the benefits of hangar flying extend to those who teach individuals to fly, which may be worthy of future research.

### Hangar Flying as a Part of the Pilot's Culture

Connecting to Bandura's (1977, 1986) theories, Yilmaz et al. (2019) discussed that the development of one's culture occurs through social learning via observation and immersion, which leads individuals to model their behaviors to align with what they have observed. This description aligns well with the current study, as social learning is vital to understanding how hangar flying stories teach and shape pilots. Daimler (2021) added to this assertion, concluding

that one's personal culture is created distinct from a larger one with connected but unique values, behaviors, and processes.

Hangar flying from a cultural perspective is what Carey (1975) might view as ritual communication, in which the focus is not only on the transmission of information but the sharing of meanings and beliefs through participation and fellowship during the ritual. Through this lens, hangar flying is a shared fellowship of aviators exploring their common traits within a community, whether that community is at the local airport or online in a social media group. Carey furthered that individuals' lives are shaped by their life experiences as well as how they construct and share reality. Sharing in the ritual of hangar flying is communication that can influence a pilot's perspectives on flying and how they participate in the aviation community and the pilot culture. Fraser (2020), regarding culture, claimed that storytelling, although a central tenet of cultures worldwide, had been dismissed as a valuable way to build and maintain culture. However, Fraser argued that stories can linger in the memory for long periods and move and shape people in ways other forms of communication cannot. Although Fraser's work was focused on storytelling as an indirect communication tool for reforming and growing the Christian culture, the concept that storytelling could be a transformative device for shaping a person's cultural beliefs, attitudes, and behaviors is essential to understanding how the storytelling found in hangar flying rituals can also be transformative for a pilot.

### Hangar Flying as a Model for Other Disciplines

While many disciplines have incorporated storytelling to foster learning, some have not. Selby and Thompson (2018) argued that the medical field could learn much from aviators' informal hangar flying activities. They found that in the aviation culture, it is customary to admit mistakes and share errors to help others not repeat them, but due to legal and social constraints,

physicians do not willingly confess mistakes, making it challenging to learn from others' past errors. Selby and Thompson furthered that safety in aviation is promoted through collaboration and teamwork, but the medical field is often driven by ego and competitiveness. Although learning from others through well-told stories could benefit doctors as it has pilots, many are reluctant. The authors concluded that the power of stories could bring people together and better the industry through collaborative and cooperative learning. Unfortunately, some industries have such barriers to learning.

**Digital Hangar Flying**

Aviation organizations such as AOPA, the Experimental Aircraft Association (EAA), the Air Safety Institute, and the Federal Aviation Administration use blogs, vlogs, and social media platforms to share stories and information in a high-tech form of hangar flying. Additionally, multiple videos are available via YouTube, TikTok, and other online video-sharing sites. It is estimated YouTube has over 2.7 billion users (Shewale, 2023), and Facebook has nearly 3 billion users (Shepherd, 2023), making these online platforms perfect places to share stories and information globally.

Digital storytelling, using platforms such as YouTube, may be a viable way to increase the educational reach of organizations such as the Air Safety Institute and will continue to become more popular (Moghavvemi et al., 2018). These researchers concluded that university students regularly used YouTube for information-seeking and academic learning and often watched videos that contained entertainment and education. Given this conclusion, it is not too great a leap to suggest that general aviation pilots could also use YouTube videos to gain information and education.

Pilot Juan Browne stated via his YouTube video on December 23, 2018, that he learned the most about aviation from hanging around the airport and listening to the stories and experiences of older pilots. In this video titled, "The Art of Hangar Flying," he also suggested that new pilots spend an afternoon hanging around their local airport learning from the hangar flying stories of the more experienced, as the older pilots are more than willing to pass on their knowledge to the younger, and there is much to be gained from doing so (Browne, 2018). This video and others like it on YouTube provide helpful examples of digital storytelling to educate others.

In a previous work that parallels this dissertation, Frizzell (2022) conducted a qualitative thematic content analysis of comments posted on a YouTube video by the Aviation Safety Institute recounting a general aviation pilot's story of a near-fatal accident that occurred in flight over Alaska. The Air Safety Institute (n.d.-b) has many videos of pilot stories; however, only one was chosen for brief analysis. The video is entitled, "Real Pilot Story: Lost Elevator," and was posted on YouTube on February 25, 2022 (Air Safety Institute, 2022a). Specifically, the viewers' comments were studied to assess how they indicated learning connections or changed behaviors after watching the story and how they reacted to the story and the storyteller. The results of this analysis revealed several themes in the comments, including gratitude and praise for the story told, praise for the pilot's skill, affirmation of the pilot's decision, suggested alternatives the pilot could have used, learning connections made, or changes in behavior planned. Many comments indicated vicarious learning, as some said they would be more cautious in their future flying after watching the story, and some stated specific behavior changes that they would implement immediately, illustrating their recognition of their agency to change. Frizzell concluded that this kind of digital hangar flying can be incredibly beneficial in changing behaviors, creating learning

connections, and inspiring others to continue learning more about aviation. The author suggested

that examining more video content and conducting in-depth interviews would help gain more

information on the common themes of the digital stories and the pilot's perceptions of this form

of hangar flying (Frizzell, 2022).

Online videos can be an effective teaching tool, providing students with information in

visual and audio formats, including demonstrations of skills and practices (Kestin et al., 2020).

Video instruction has been shown to be effective in many subject areas, including flight training.

Long-time aviation educators John and Martha King started using video instruction for flight

training in the 1980s and have revolutionized the aviation education industry (King Schools,

n.d.-a). The website boasts that the Kings' videos have "taught more pilots than anyone in the

history of aviation" (King Schools, n.d.-a, para. 4). The National Aviation Hall of Fame (2019)

said that the Kings' video courses have profoundly impacted pilot training, enabling more pilots

to pass their exams and become safe pilots. Though the Kings' videos were likely on VHS in the

1980s, online platforms like YouTube are where 2.7 billion users get their videos today

(Shewale, 2023).

In an aviation-related study, Sellberg et al. (2021) explored how YouTube videos could

train pilots in non-technical skills like communication and decision-making and focused

primarily on how videos were curated for effective teaching. They described curating the videos

as the "process of selecting, analyzing, using, organizing, and sharing educational videos on

YouTube" (p. 94). They found selecting and curating the videos difficult, presenting many

challenges. Their study suggested that videos considered for hangar flying must also be curated

by general aviation pilots so that they receive the best information. The researchers also found

that videos that seemed authentic were perceived most favorably, as users believed they had

opportunities to learn the depicted mistakes of others (Sellberg et al., 2021). Frizzell (2022) also

found that the authenticity of the storyteller was considered an important trait by the video

viewers in their study. This finding pointed out a useful connection regarding how general

aviation pilots curate narratives from hangar flying, whether in person or digital format.

## Summary of the Chapter

Chapter 2 provided an overview of the communication traditions and theoretical

frameworks that guided the research exploring hangar flying as a vicarious learning tool for

developing general aviation pilots' flying cultures. The literature related to the topic was

reviewed, with attention given to storytelling and, more specifically, digital storytelling.

Literature related to vicarious learning, hangar flying, and the general aviation pilot culture was

also discussed. While there is a lack of studies addressing hangar flying as a vicarious learning

tool, some studies contained research paralleling the present analysis and provided insight into

how individuals learn through informal methods like storytelling. Even so, there remains a gap in

research on storytelling within the general aviation context and with general aviation pilots. This

research adds to communication and aviation scholarship by using qualitative methods to explore

the role of hangar flying as a vicarious learning tool. Chapter 3 explains the methodological

approach to this research study including data collection and analysis procedures.

## CHAPTER 3: METHODS

### Overview

This chapter presents the research method, design, data collection, and analysis for this study. Thus far, the researcher has shown that there is a lack of scholarly research regarding hangar flying and that this kind of context-based storytelling may help correct current deficiencies in formal general aviation flight training. Using a digital content analysis approach, the study explored the communication phenomenon of hangar flying via an investigation of YouTube videos containing pilot stories. This chapter further explains the research method, design, research questions, setting, sample, the researcher's role, data collection, analysis, trustworthiness, ethical considerations, and a summary.

### Research Method and Design

Communication scholars focus on the construction and effects of messages and their meanings, seeking answers to questions and exploring phenomena via various approaches (Keyton, 2019; Punch, 2014). With this focus in mind, the study used qualitative methods as its research approach to exploring a lesser-known communication phenomenon that occurs within the aviation community. Specifically, this research employed a qualitative content analysis approach, identifying emergent themes within digital hangar flying content in exploring hangar flying as a communication practice for vicarious learning in the broad development of general aviation pilots' personal flying cultures.

Content analysis can quantitatively measure the frequency of the occurrences of words or phrases in a text or can qualitatively focus on gaining understanding or interpreting meaning from a piece of content (Amundsen, 2021). The content analysis approach has been used in many other studies involving exploratory qualitative research (Gilli et al., 2023; Hou et al., 2016;

Joung & Byun, 2021) in which the goal is to investigate a topic or phenomenon that has not

previously been the subject of in-depth studies (George, 2023; Swedberg, 2020). Additionally,

coding themes within content to derive meaning has also been used widely in exploratory

qualitative research (Alexander et al., 2019; Choo et al., 2018; Warner & Griffiths, 2006). The

focus of this research was to collect data from online videos featuring hangar flying stories,

which were analyzed and thematically coded to gain an understanding and interpret meaning

concerning the communication practice of digital storytelling within an aviation context.

**Emergent Design**

This research process was emergent, which means the research plan could not be tightly

prescribed, as all elements of the plan may shift or change as the researcher begins data

collection (Creswell & Creswell, 2018). Hangar flying is not a new concept within aviation;

however, it lacks a base of scholarly research in aviation and communication. An emergent

design allows the researcher to adapt to new ideas and concepts and explore unexpected paths of

information that may be discovered during the research process. Further, an emergent design

welcomes unexpected or unanticipated information, adding depth and interest to the study

(Pailthorpe, 2017).

**Qualitative Methods**

The general method for this study was qualitative. Tracy (2020) claimed many

advantages of qualitative methods; most importantly, this method can help people better

understand the world, how meanings are shared, and how cultures are created. Unlike

quantitative methods, qualitative studies focus more on words than numbers and seek to include

multiple perspectives in creating a larger, more complex picture of a phenomenon (Creswell &

Creswell, 2018). The qualitative method differs from the quantitative in that the quantitative

seeks to prove or validate a hypothesis. In contrast, qualitative seeks to discover trends, patterns, and deeper meanings of an issue by analyzing multiple perspectives (Terrell, 2016).

Qualitative studies take a more holistic approach to a phenomenon, reporting multiple perspectives, thus creating a more complex picture of the subject or problem (Creswell & Creswell, 2018). This study aimed to analyze the content of the digital stories and gather perspectives on the hangar flying story to understand how storytelling may build general aviation pilots' knowledge, influence their flying, and help them construct new views of their piloting world. This study focused on collecting and coding digital storytelling content and user comments found in online hangar flying videos. The study utilized qualitative methods using an inductive style, allowing data to build from specific to general themes and allowing the researcher to interpret the more significant meaning of the data collected (Creswell & Creswell, 2018). Qualitative methods focus more on words, and this research specifically explored aviation storytelling and its effects, with data and further questions expected to emerge during data collection.

Qualitative inquiry is a broad approach to communication phenomenon based on the idea that people use what they see, hear, and feel to construct their realities and make sense of their social experiences (Rossman & Ralls, 2017). There are many approaches to inquiry within qualitative studies, including case studies, ethnography, grounded theory, narrative, and phenomenology (Creswell, 2013a). Additionally, Creswell (2013b) said that content analysis is a flexible approach to qualitatively analyzing data using inductive methods. The specific design for this study was a qualitative content analysis approach utilizing thematic coding of digital storytelling content found in YouTube videos featuring hangar flying-type stories and in the comments left by viewers of the content. In qualitative research, this type of data analysis is a

method to identify primary themes or classify written or oral content with similar patterns into

categories (Creswell, 2013b). Further, qualitative content analysis allows researchers to examine

meanings and themes subjectively, helping them understand a phenomenon and providing thick

descriptions in interpreting the content (Shava et al., 2021). In this academic study, 110 digital

artifacts consisting primarily of videos deemed by the researcher to contain hangar flying content

were analyzed to determine how the story is communicated, for what purpose it is being told, if

there are indications of vicarious learning amongst the viewer's comments, and what themes are

identified in the content and comments.

Finally, the data collection and analysis were guided by the theoretical frameworks of

Bandura's social learning and social cognitive theories (1977, 1986), Fisher's (1984) narrative

theory, and Gerbner's (1969) cultivation theory. These perspectives guided the content analysis,

coding, and theme generation and assisted in answering the research questions posed in the

study. Through these theoretical lenses, the data collected from the video content allowed the

researcher to make inferences regarding the role of hangar flying stories in the learning processes

and flying culture development of general aviation pilots.

**Research Questions**

The research sought to explore hangar flying as a communication practice by analyzing

the content of online hangar flying videos and the responses made by pilot viewers. The study

aimed to fill communication and aviation research gaps concerning the connection between

hangar flying stories and their use as vicarious learning tools in cultivating general aviation

pilots' flying cultures. The following questions drove the study:

**RQ1:** *What are the primary themes of the digital hangar flying content?*

Specific to this question, the researcher looked for recurring, repeating, or stand-out patterns within the videos of hangar flying stories and experiences. These themes helped the researcher understand what kind of personal flying culture a pilot has developed from the hangar flying they engage in. Through the video content analysis, the researcher identified multiple themes, including themes of adventure, safety, and learning.

**RQ2:** *How do the viewers of the digital hangar flying content respond to it?*

Analyzing the viewer comments on the videos provided insight into how this type of storytelling content is received and perceived by general aviation pilots who may consume this information. Further, by looking at the content of the comments, the researcher determined the overall sentiment of the responses and identified indications of how the story influenced the viewers.

**RQ3:** *What inferences can be made concerning a connection between vicarious learning and hangar flying?*

Building on the previous question, this question looked for any indication of vicarious learning from the hangar flying story amongst the viewers' comments. Did the viewers indicate that they had made a learning connection or that the story impacted them to make behavioral changes? If so, what can be inferred from these connections? If this kind of content can foster vicarious learning amongst viewers, inferences could be made that hangar flying content such as this could also foster learning amongst general aviation pilots and could influence their personal flying cultures.

**RQ4:** *What primary goals of the digital hangar flying content can be inferred?*

The researcher was interested in discovering the possible motive of the story and the storyteller in creating the content. Was it to teach a lesson, increase safety, share an experience,

entertain, or educate? Understanding the primary goal or lesson to be taught through the hangar

flying story helps understand the foundation of this kind of storytelling. From the content alone,

it would be difficult to determine the storyteller's motive or exigency. However, the researcher

can infer what the motive or goal of the storyteller might be. Further, by looking at the possible

motive, the researcher can infer if the motive was accomplished by careful study of the viewers'

comments.

**Setting**

Qualitative researchers do not often work in laboratories nor bring participants into

staged locations for study; rather, they conduct research in the field where the participants

experience the communication phenomena being explored (Creswell & Creswell, 2018).

Research has shown that traditional, in-person hangar flying often takes place around a table in

the airport's office or airplane hangar, although the setting can vary and is not specific to one

location (Harrison, 2021; Meyer, 2015; Vandenputte, 2021). A benefit of the Internet is that

hangar flying stories can now be found online via video-sharing sites such as YouTube, and thus,

one does not have to travel to an airport lounge to consume stories or learn from them. The

qualitative content analysis used in this research gathered publicly available hangar flying stories

found on YouTube, allowing the researcher to conduct a more in-depth study of the content than

possible with face-to-face interviews or observations at airport sites. The researcher was able to

review the content repeatedly by rewinding or fast-forwarding the videos and had access to user

comments typically found below the videos, which offered further data for analysis regarding

sentiment, indications of vicarious learning, and themes of personal flying cultures amongst the

viewers. The researcher believes that the visual nature of this content allows a general aviation

pilot or viewer to see and hear what happened to another pilot in some situation, creating a robust

opportunity for vicarious learning without any danger. While the setting for digital hangar flying may vary in location, the researcher could access the content from any Internet-connected computer, reducing the time needed for data collection and allowing more in-depth analysis.

**Sample**

A total of 110 online videos found on YouTube that represented digital hangar flying artifacts were collected. YouTube is the second-most visited webpage, boasting over 2 billion users and 500 hr of video uploaded every hour (Sui et al., 2022). These facts made the online video platform a good source for collecting the sample for this study's qualitative content analysis. The specific unit of analysis for this study was videos of a hangar flying story told from the pilot's point of view, and the core element was that the story offered a lesson to be learned or an experience to be shared.

Since the focus was primarily on general aviation, this study did not include airline accident analyses or tales from the airline industry. Some featured pilot storytellers held commercial or instructor ratings, but the stories or experiences shared were not related to airline operations or formal instruction. For example, Steveo1kinevo (n.d.) and Missionary Bush Pilot (n.d.) offered shared experiences on their channels, and while both often hold commercial ratings, they are still considered general aviation pilots. Although they often fly as a profession, they share many kinds of experiences related to general aviation on their channels, which is why they are included in the sample.

Each qualified video had to have a general aviation pilot story that teaches some lesson or shares some experience related to general aviation, have at least 1,000 views and 1,000 subscribers, and have user comments posted below the video. In an initial search, most videos with less than 1,000 views were generally of lower production quality. YouTube allows users to

monetize their content after reaching 1,000 subscribers (YouTube Help, n.d.). Thus, the

researcher created the parameters of 1,000 views and 1,000 subscribers as a baseline for

collecting hangar flying content of significance.

In addition, the viewer comments for each video also served as a secondary sample for

analysis. YouTube allows viewers to post comments that represent their opinions, questions,

insights, appreciation, and overall sentiment regarding the content and creator of the video

(Kavitha et al., 2020). Kavitha and colleagues looked at the relevance of YouTube comments to

the content of the videos, attempting to build a comment classification model. Comments can

gauge positive or negative sentiment and show viewers' connections to the video content. It was

believed that the comments of the hangar flying videos might provide data suggesting that this

kind of content could foster vicarious learning amongst general aviation pilots.

Two types of hangar flying video content were collected referred to as *purpose-built* and

*user-generated*. Purpose-built content is created to impart some lesson or knowledge via video

story, often by an established organization, and user-generated content is created by an

individual without any apparent purpose. Both types of videos contain stories from pilots;

however, purpose-built content has more of a staged, professional look compared to the raw,

authentic look of user-generated content. Purpose-built content may be compiled or created by

others and tends to be focused on relaying a message or solving a problem for a specific

audience (Katai, 2023). User-generated content contains information the user contributes and has

become a focus of communication research, especially content analyses focused on theme

identification and viewer sentiments (Naab & Sehl, 2017).

Qualitative research calls for purposeful data selection to help the researcher understand

the research problem (Creswell & Creswell, 2018). Purposeful or purposive sampling means the

researcher intentionally selects data that fits the project's research questions and purpose and

helps focus on the communication phenomenon being studied (Tracy, 2020). The research plan

cannot be tightly prescribed in qualitative research, as new data may emerge and alter the plan

(Creswell & Creswell, 2018). Further, sample sizes cannot often be strictly defined in qualitative

research, as the sample size often grows with new data until a point of saturation occurs where

no new information emerges or the information collected becomes repetitive (Kyngäs, 2020).

Lee (2014) concluded that there was no magic number regarding the amount of data that should

be included in qualitative research. Lee furthered that the quality of the data was more important

than quantity. The goal was to gain a sample size representative of available online hangar flying

video content to better understand what kind of content there is, what the primary themes of it

are, and how pilots are responding to it so that inferences can be made regarding hangar flying's

use as a vicarious learning tool. However, a larger sample size may be less important than a

smaller one that provides an in-depth understanding of the phenomenon (Boddy, 2016). Initially,

the researcher planned to use a sample of 75-100 digital artifacts, but as new data emerged, the

collection continued until a saturation point was reached with 110 total videos. The data became

repetitive, with no new themes emerging, so data collection was stopped, having achieved a

representative sample of digital hangar flying stories.

**Procedures**

Data collection involved initially selecting video artifacts from the online platform

YouTube. These videos were required to feature a hangar flying story told by a general aviation

pilot. They were curated and deemed appropriate for the study by the researcher, who is a

certificated private pilot. The video was required to have at least 1,000 views and 1,000

subscribers, and viewers' comments were to be shown below the video. Content deemed

purpose-built, as well as user-generated content, was collected. While 75-100 artifacts were an estimated sample size, data collection continued until saturation, or when no new data or themes emerged (Charmaz, 2006). Saturation occurred when the sample size reached 110 videos.

Videos were viewed multiple times, and transcriptions were collected for thematic coding. YouTube provided automatic transcriptions for each video, which allowed the researcher to begin analysis much earlier than planned. While this provision was advantageous, YouTube's transcription system often failed to record the exact words of the storyteller or erroneously autocorrected them. This issue required the researcher to review each transcript multiple times and make minor corrections for coherence. Once transcriptions were prepared, common themes were identified in the content, and inferences regarding the content's purpose were made.

As a secondary data source, the viewer comments for each video were also explored for common themes, indications of vicarious learning, and general responses to hangar flying story content. Primarily, the researcher reviewed the comments line-by-line for indications of vicarious learning and overall sentiment. Additionally, a free online tool, Hadzy.com (Hadzy, n.d.), was also used to search for keywords, such as "learn" or "lesson," among others, to find specific comments that would assist in answering the research questions. The tool can search, sort, and analyze YouTube video comments, which increased the efficiency of the analysis phase. Any indications of vicarious learning or general sentiment were then recorded in a Microsoft Access database and organized by video. This procedure was completed by directly copying the vicarious learning comment into a designated database section. This process was repeated for every video. Comments were also coded within the database using such words and phrases as "vicarious learning," "expect the unexpected," and "safety-minded." The codes for the comments were also analyzed for connections, and common themes were generated from them.

The combination of line-by-line review, database recording and searching, and the online tool Hadzy.com aided the researcher in deriving answers to this study's research questions regarding overall response and vicarious learning within the approximately 35,000 viewer comments.

Due to the large volume of data collected, a database was created using the Microsoft Access computer application. This program allowed the researcher to record the links to each hangar flying video and the findings as they emerged. All information regarding the video, including findings concerning the content and viewer comments, was recorded in the database along with the researcher's copious notes. The use of this database system allowed analysis to begin shortly after collection. Queries were conducted for reoccurring words or phrases, which proved valuable in the analysis phase of the research. Using these queries, a coding system was also developed to identify themes of the content of the videos as well as the connected viewer comments. The codes were recorded within the database and often changed as new data emerged. Once the analysis was complete, the researcher compiled the findings and prepared narratives and visualizations to report their interpretations.

## The Role of the Researcher

Creswell and Creswell (2018) contended that a researcher's "personal background, culture, and experiences hold potential for shaping their interpretations" and "may shape the direction of the study" (p. 182). Reflexivity or self-reflection upon these elements is vital to maintaining self-awareness of one's biases so that discrepancies in data or alternative explanations are not ignored. Additionally, in qualitative studies, the researcher is the key instrument of data collection and analysis and is primarily responsible for gathering and making sense of the data (Creswell & Creswell, 2018).

The author of this study is a certificated private pilot rated to operate single-engine land aircraft and approached this study with many personal experiences related to vicarious learning through storytelling. He is neither instrument-rated nor possesses any other advanced rating. His flight training took place over several years, with multiple flight schools and instructors, each adding to his overall learning experience. He also approached this study with the theoretical lens of social learning, meaning that attitudes, beliefs, and behaviors are learned through observations and interactions with others (Bandura, 1977). The researcher has been a pilot for over ten years, and in that time, he has encountered many other pilots, student pilots, and instructors who have shared stories and experiences that have proven personally helpful in conducting his flying activities. In addition to these face-to-face interactions, the researcher has consumed much digital hangar flying material in the form of online blogs, articles, and, most significantly, YouTube videos. The researcher subscribes to multiple YouTube channels featuring pilot stories, flight training, and other content generated by established organizations like the Air Safety Institute and individual users. The researcher's experience as a private pilot and his experience with this type of content aided in the selection of video artifacts for this content analysis study. He can discern a significant example of a digital hangar flying story from one that is not. The researcher strove to remain aware of any ethical implications these personal experiences and knowledge may have caused and worked to prevent them.

Creswell and Creswell (2018) pointed out that the researcher must be mindful of their past experiences and how these could shape the study's interpretations and outcomes. While the researcher's formal flight training taught him many technical skills, consuming the experiences of other aviators by watching, reading, or listening has increased the breadth and depth of his piloting knowledge. Further, these stories have influenced his behaviors, caused him to create

new routines, and saved his life on more than one occasion. The stories he has heard while participating in hangar flying at his local airport and through aviation videos, blogs, and articles have all shaped his personal flying culture, which he feels is characterized by themes of safety and adventure.

The researcher has also been an instructor in higher education for 20 years, and one of his primary teaching techniques is storytelling. He has seen stories impact students more than lectures can, increasing their retention and recall of information and simply making the class more enjoyable. Whether the topic is airplanes or public speaking, the researcher approached this study with the belief that storytelling allows individuals to engage with a subject uniquely, bringing about a deeper understanding and connection to it that shapes their future attitudes, perceptions, and behaviors.

Regarding this study, the author could relate to the pilot's experiences depicted in the videos and understood the terminology and jargon common in aviation. Additionally, his role as both pilot and researcher helped him understand pilot-viewer comments and recognize emerging data. The author accepts his position within the study as the primary research instrument, a pilot, and a storyteller. During the research process, the author remained aware of his biases, personal experiences, and background in shaping the study.

## Data Collection

This scholarly research collected qualitative data through a content analysis of aviation-related YouTube videos featuring hangar flying stories communicated by general aviation pilots to viewers, who are likely also general aviation pilots. Utilizing purposive sampling, the researcher collected 110 online video artifacts from the YouTube video-sharing platform and analyzed them using thematic codes. Initial Internet searches within both Google and YouTube

were conducted to collect video stories of pilots. Using keywords such as "pilot story," "hangar

flying," "hangar talk," and "airplane story," the researcher found and collected those videos that

met the criteria of a significant digital hangar flying story for this study. Those criteria were a)

the video must contain a general aviation pilot story that taught a lesson or shared an experience,

b) have at least 1,000 views, c) have at least 1,000 subscribers, and d) have viewer comments.

Stories regarding airline pilots or airline accidents were not included, as the focus of this study

concerned hangar flying and the general aviation pilot.

Additionally, each video's viewer comments were explored as a secondary and connected

data source. The viewer comments were analyzed for common themes, indications of vicarious

learning, and general responses to hangar flying story content. For most videos, the researcher

reviewed each comment line by line, looking for indications of vicarious learning, which were

then recorded into the Microsoft Access database. The exact viewer comment was cut and pasted

into the database and organized by vicarious learning connections and general responses and

sentiments. Additionally, the researcher discovered a free online tool called Hadzy, which can

search, sort, and analyze YouTube video comments, providing usernames and the dates on which

they commented (Hadzy, n.d.). This tool allowed the researcher to search for keywords in a

particular video's comments. The tool also provided a link back to the YouTube website for each

comment and, when used, pinned the specific comment at the top of the comment section. This

feature proved helpful when the researcher wanted to screenshot the comments for visualization

within this document. The combination of line-by-line reviews and the features of the database

and Hadzy.com increased the efficiency of data collection regarding the viewer comments on the

hangar flying videos. Most videos had multiple comments and replies, providing ample content

to inform the study concerning the role of hangar flying in a general aviation pilot's life.

Videos were viewed, and transcriptions of the content were collected, coded, and analyzed for emergent themes and findings to answer the study's research questions. The overall goals were to understand the communication practice of hangar flying, how the stories are communicated, the themes that are present, and how viewers and pilots respond to the content. Additionally, the researcher looked for connections between the content and comments and vicarious learning, as well as indications of how the content may influence a pilot's personal flying culture. The researcher took copious notes while viewing the videos and comments to record his thoughts and perceptions concerning the hangar flying interaction. As mentioned, transcriptions were automatically generated by YouTube's platform, although these were often incomplete and incorrect, requiring the researcher to review them many times and make corrections. Transcriptions were read and reviewed while viewing and listening to the playback of the online video to ensure a match.

The data was organized using the computer database program Microsoft Access, which proved to be very useful in managing the large volume of data collected from the videos and comments. The researcher used the program to create a digital data entry form, which allowed him to record information from the video story and the comments all in one place. Data collected included the title of the video, its website address (URL), username, number of subscribers, views, and entry points for recording codes, notes, themes, and direct quotations from the story and comments. The researcher used dual computer monitors, which were helpful to view the video on one screen and enter data on the Access form on the other. The data was simultaneously recorded on a master spreadsheet within the database. Due to this helpful system, analysis began nearly simultaneously with data collection. Once compiled, the database allowed the researcher

to easily search for recurring words or phrases and quickly access the videos by clicking their recorded links.

**Qualitative Content Analysis**

Using qualitative content analysis was valuable for exploring hangar flying in online videos and its potential role as a communication practice that enables vicarious learning and influences the personal flying culture of general aviation pilots. An advantage of a content analysis approach is that it is rooted in communication studies, as the data is always understood in relation to a specific communication context (Mayring, 2015). In this study, the communication act of storytelling was studied within the context of aviation and focused on a particular type of storytelling in that context, known as hangar flying.

Content analyses are often used in quantitative research, in which the frequency or occurrence of words and phrases are measured within some text or other content; however, this method can also be used in qualitative research (Terrell, 2016). Quantitatively, one is focused on measuring or counting, and qualitative content analysis focuses on interpreting and understanding the meaning of the data (Luo, 2023). Scholars have defined and redefined content analysis for many years, although most conclude that a qualitative content analysis allows researchers to make inferences based on a systematic analysis of some kind of recorded communication, whether that be in text or visual format (George, 1959; Krippendorff, 2004; Terrell, 2016). Researchers look for both a manifest or apparent meaning as well as the latent or underlying meaning of the content, identify themes that align with the purpose of the study, and answer the research questions (Terrell, 2016). An inductive or deductive approach can be taken, and while both have some merit, an inductive approach to the content analysis was taken for this study. Inductively, themes and categories emerge through the researcher's investigation and

careful examination of the content, followed by coding the raw data to make inferences and interpretations (Shava et al., 2021). Creswell (2013b) concluded that qualitative content analysis allowed flexibility in analyzing data in a study. Shava and colleagues found it to be a valuable alternative to traditional quantitative methods, especially when the researcher is concerned with providing rich, thick descriptions or interpretations of a phenomenon. Additionally, Shava et al. added that qualitative content analysis can lead to a better understanding of a phenomenon from the perspective of those participating.

Content analysis has historically been used for print-based content research, including newspapers, magazines, and advertisements (Robinson & Callister, 2008). For this study, the researcher focused on online video artifacts as the unit of content analysis. Many previous studies have explored online artifacts, including videos, as a data source for content analysis. Hou et al. (2016) investigated the promotional videos used by China's ten major tourist destinations. Yoo and Kim (2012) studied how obesity topics are framed in YouTube video clips exploring themes found in the content. Several studies, including Gaus et al. (2021) and Alharethi et al. (2022), have used a qualitative content analysis approach to explore online video artifacts and viewer comments, just as this study set out to do. These researchers found emergent themes in both the content and the comments that helped them better understand a phenomenon. An advantage of such digital content analysis research is that digital content is vast and widely available due to the Internet, which allows the researcher to gather a large quantity of data to analyze (Shava et al., 2021). Further advantages include the fact that data collection is noninvasive and unobtrusive, as most content is publicly available, like the hangar flying videos found on YouTube (Amundsen, 2021).

Hangar flying is a well-known communication practice in the aviation community; however, it is lesser-known outside of it. This study aimed to explore the practice and provide a starting point for future research that contributes to both the body of communication and aviation knowledge. Since the Internet can now offer broad access to content, a qualitative content analysis of YouTube hangar flying stories allows the researcher to discover more nuanced themes within the video storytelling than may have been found through other approaches and seems a sensible way to build a foundation for future research.

A qualitative content analysis approach to hangar flying in the digital format was a sensible choice for this study as the communication phenomenon has evolved from face-to-face to online interactions. While the researcher has experienced hangar flying in the traditional in-person format and is assured it still exists, it seems to no longer be the primary method of sharing aviation stories. Given the number of online magazine articles, blogs, vlogs, podcasts, and videos available, including those created by the Aircraft Owners and Pilots Association, Air Safety Institute, the Experimental Aircraft Association, and individuals, it is fair to say that hangar flying has shifted from primarily a face-to-face interaction to include a digital one occurring in online spaces.

### *YouTube Videos as a Data Source*

Many studies have used YouTube videos as a data source for content and thematic analysis. They can provide a wealth of content on a variety of subjects for researchers to explore, including fitness, obesity, bullying, COVID-19, self-harm, and more (Ratwatte & Mattacola, 2021; Ryan-Vig et al., 2019; Thelwall & Cash, 2021; Yoo & Kim, 2012). Sui et al. (2022) confirmed that the nature of the YouTube platform can provide many research opportunities through the content, likes, and viewer comments left in response to the videos.

YouTube videos provide a participatory and interactive data source as users and viewers create and engage with the content on the platform (Sui et al., 2022). The site allows viewers to comment on the content of the videos and share insights, thoughts, and opinions publicly (Patterson, 2018). Patterson discovered that one could witness a level of intimacy and sharing that may not have been achievable in face-to-face interviews as individuals may choose to share thoughts online that they might not in their offline worlds. Comments on videos may reflect very personal thoughts and are a secondary data source to the content of the video. Exploring the connections between the content of the hangar flying videos and the user comments grants some interesting insight into how hangar flying stories are perceived and utilized by pilots who consume them. Looking beyond the content to the comments of users humanizes this content analysis of hangar flying and keeps the focus on how communicating stories may shape the learning and personal flying culture of a general aviation pilot.

## Data Analysis

The study used qualitative content analysis to collect digital hangar flying artifacts found on the YouTube platform to understand the communication practice of hangar flying and its influence on general aviation pilots' learning and personal flying cultures. These videos were analyzed and coded to identify emerging themes in the content and the connected viewer comments.

YouTube's platform automatically generates transcripts for videos on its site, which saved the researcher the step of manually transcribing 110 videos. However, it was discovered that there were some drawbacks to this auto-generated process. First, the transcripts were not downloadable and had to be copied to a separate document or read on screen, a process that was sometimes inefficient and disorganized. Second, the system that generates the transcript often

does not transcribe completely verbatim, losing some words and adding others. This flaw

necessitated the researcher checking the transcripts multiple times while viewing the video to

ensure a match between the storyteller's words and the transcript. While this process was

tedious, the numerous reviews allowed the researcher to begin the initial analysis while ensuring

data accuracy.

**Thematic Analysis**

Thematic analysis was used to analyze the data collected from the videos and field notes,

noting common themes and any possible relationships between them. Thematic analysis is used

for "identifying, analysing and reporting patterns (themes) within data" (Braun & Clarke, 2006,

p. 79). Themes are patterns in the data, or as Keyton (2019) said, "a theme is a conceptualization

of an interaction, relationship, or event" (p. 313). Themes are often recurring or repeated words,

phrases, and other patterns of meaning within textual data, and while these are said to emerge,

the analysis is not passive (Braun & Clarke, 2006). The researcher actively identified the patterns

and selected those that served to answer the research questions posed in the study while noting

and exploring all others for more breadth and depth of knowledge.

This study followed Braun and Clarke's (2006) phases of thematic analysis as a guide for

analyzing the transcribed online hangar flying videos. The first phase consists of familiarizing

oneself with the data by reading and re-reading the transcripts and noting any initial patterns.

Second, the researcher begins coding any interesting features or patterns across the entire set of

transcriptions and organizing these using spreadsheet computer software. The third phase begins

to collate the codes in potential overarching themes and gather specific quotes and data from

relevant transcriptions. Next, the researcher reviews the theme choices, ensuring the codes and

extracted data from the transcripts make sense. The fifth phase involves creating clear definitions

and writing explanations for each theme so the reader understands what the themes are and what they are not. Finally, the sixth phase concludes the analysis, with the researcher telling the story of the data and showing its validity and merit by providing vivid examples from the data that answer the study's research questions and fulfill its purpose. This process was initially carried out with the hangar flying video content and then repeated with the viewer comments for each video.

**Coding of Content**

A coding system was developed to identify the transcripts' recurring words, phrases, themes, and patterns. Codes are tags or labels assigned to pieces of data to attach some meaning to them (Punch, 2014). The researcher created coding labels with *in vivo* terms, which originated with the language used by people in the videos. Punch furthered that these types of descriptive codes are helpful in the initial analysis phase.

An initial coding process was developed early in the analysis process and modified as necessary. The story's content was labeled with such codes as: "mechanical failures," "weather-related," "hazardous attitudes," "aircraft ownership," "aviation is fun," "emergencies," "safety is important," and "great lessons." These codes were analyzed for connections and combined to form common themes within the video stories. Additionally, the viewer comments for each video were analyzed to determine overall sentiment and indications of vicarious learning. Coding for the comments included "vicarious learning," "learning from mistakes is valuable," "safety is the top priority," "gratitude," "inspired to learn to fly," "never stop learning," and "expect the unexpected." The codes for the comments were also analyzed for connections and common themes.

A database was created to house all of the collected data and serve as the source of data analysis. Forms, reports, and queries were created to analyze certain concepts further, as well as the occurrences of words and phrases within the content, allowing the researcher to analyze and make initial interpretations more efficiently. Additionally, the researcher discovered a free online tool called Hadzy, which can search, sort, and analyze YouTube video comments, providing usernames and the dates on which they commented (Hadzy, n.d.). This tool allowed the researcher to search for keywords within the comments for a particular video. The use of the database and Hadzy aided the researcher in creating codes and generating primary themes in an efficient and organized way.

## Trustworthiness

The value of qualitative research is its particularity, or the particular themes and outcomes developed in a specific context, such as those found in this study concerning general aviation pilots and hangar flying (Creswell & Creswell, 2018). Creswell and Creswell also claimed that qualitative studies do not focus on replicability like quantitative ones. Thus, each research study is unique, and outcomes are based on the researcher's subjective interpretation. Therefore, since the data cannot be validated quantitatively, qualitative researchers must establish their data's trustworthiness instead so that readers will have confidence in the research outcomes (Stahl & King, 2020). While the content of each online hangar flying video was unique, as was the researcher's analysis and interpretations, the researcher strove for the data to be trustworthy and worked to ensure the study's credibility, dependability, confirmability, and transferability (Claxton & Mott, 2022; Lincoln & Guba, 1985).

**Credibility**

Credibility refers to the believability of the data or a quality that reflects that the data and findings of a study are true and accurate so that a reader can use the data to act or make decisions (Claxton & Mott, 2022; Keyton, 2019; Tracy, 2020). In qualitative research, credibility can be established in various ways, including prolonged time in the field, triangulation, member checking, thick descriptions, clarifying researcher bias, and presenting discrepant information (Creswell & Creswell, 2018). This research study established credibility through prolonged time in the field, triangulation, and thick descriptions.

*Prolonged Time*

Some have argued that qualitative content analysis is labor-intensive and time-consuming, requiring the researcher to collect hundreds of artifacts, read or view them multiple times, painstakingly code the content, and then report the findings of the analysis (Selvi, 2019). However, Krippendorff (2004) argued that content analysis could be done efficiently, especially with the help of technology. Although each video varied in length and technology was leveraged in the process, the researcher estimated that the analysis process took approximately 60-70 hr and included viewing, transcribing, coding, and analyzing each video artifact. This prolonged time adds credibility to the study as the researcher gained more experience with the data, helping them to better understand the communication phenomenon of hangar flying as it is presented in online video form (Creswell & Creswell, 2018).

*Triangulation*

Triangulation involves using various methods, data sources, or participant perspectives to establish themes (Creswell & Creswell, 2018). For example, the reviewed literature on vicarious learning through storytelling in various contexts lends credibility to hangar flying's use as a

learning tool. Using the extant literature, one can draw parallels between the effectiveness of

storytelling in a psychology classroom and storytelling in the aircraft hangar. Additionally, as the

content of each hangar flying video was analyzed for common themes, the viewer comments also

provided a secondary data source to inform the research, make inferences, and answer the

research questions.

### Thick Descriptions

Additionally, the researcher has provided thick descriptions of the content and viewers'

perspectives on the hangar flying stories in the videos. Using quotes from the story and the

viewer comments, the researcher hopes to bring the reader into a shared experience of how

general aviation pilots perceive hangar flying and how it may influence their learning and

personal flying culture. The comments from the viewers, who are likely general aviation pilots,

will be shared to draw inferences about how the communication practice of hangar flying shapes

a pilot's perspective of aviation.

### Dependability and Confirmability

Qualitative dependability refers to the stability of data over time and is similar to

reliability in quantitative research (Kemparaj & Chavan, 2013). Claxton and Mott (2022)

described dependability as the extent to which the study could be repeated with similar results.

The dependability or reliability of data suggests that if an experiment is conducted repeatedly in

similar conditions and provides consistent results every time, then the data from the experiment

could be considered reliable (Kirk, 2019). Thus, consistency is the primary way to measure

reliability (Pierce, 2008). Concerning aviation, if an aircraft's stall warning light or horn

illuminates or sounds at the same airspeed every time the aircraft approaches an aerodynamic

stall, then the light and horn's warnings would be reliable indicators of an impending stall. For

this work, the researcher has ensured the dependability and consistency of the dataset with multiple checks that the transcripts match the video recordings and that the videos all meet the criteria to be a significant hangar flying story. Additionally, field notes taken during data collection have verified data and aided in presenting accurate information.

Confirmability refers to the study being free of researcher bias, ensuring the reader that results are based on the data gathered and not influenced by the researcher (Claxton & Mott, 2022). In this study, the researcher exercised reflexivity and maintained awareness of how personal biases, past experiences, values, and culture may shape their interpretations and approaches to data collection and analysis (Creswell & Creswell, 2018). The researcher attempted to limit the influence that personal perspectives may have had on the data collected or its analysis. Additionally, the researcher kept notes about experiences, observations, insights, or concerns during the data collection and analysis phases to foster this reflexivity.

**Transferability**

While qualitative research does not seek to be generalizable (Creswell & Creswell, 2018), it does seek to be transferable, meaning that the findings could be transferred or applied to similar situations or contexts (Tracy, 2020). Tracy furthered that transferability occurs when readers resonate with a study or find meaning within it and apply the research findings to something personally significant. Unlike the objective nature of generalizing a finding to multiple contexts, transferability is a more subjective quality of qualitative studies pertaining to a particular context or reader situation (Tracy, 2020). Scholars believe that to enable transferability, thick descriptions of the research processes, settings, data collection, and analysis must be provided in detail so that enough information is available for the reader to adequately transfer the findings to another similar context (Stahl & King, 2020).

In this study's results and conclusions, the researcher has attempted to thoroughly describe hangar flying, the research settings, the data collection process, the themes generated, and the overall findings. The researcher has experienced transferability in examining studies that found storytelling effective for vicarious learning in non-aviation contexts like education. The researcher considers this study on hangar flying to be exploratory and foundational, as few studies exist investigating this communication practice in an aviation or communication context. As such, there may be opportunities for future aviation and communication scholars to experience the transferability of this study's findings.

## Ethical Considerations

Ethical considerations were important to this study and extended throughout the research process. Although the study did not involve human subjects, the researcher obtained approval from the university's institutional review board (IRB) to collect data for the digital content analysis. Any qualitative research conducted in online settings may raise questions of confidentiality or concerns about whether or not a researcher should maintain the privacy of individuals who have shared information in publicly accessible spaces (Pietilä et al., 2020). These scholars discussed the researcher's struggle to preserve anonymity and integrity in data collection and analysis, finding that keeping both balanced is challenging. As technology advances, more individuals share personal information online, many without fully understanding the potential risks (Pietilä et al., 2020). This research utilized publicly available YouTube videos; thus, usernames and content creator names are public information. Although usernames were not hidden or masked in this study's findings, the researcher made every effort to maintain the data's integrity without needlessly infringing on the rights of those individuals who created the video content or commented. The researcher believed that using the authentic usernames of the creators

and commenters added credibility to the study, as the reader could reference the exact comment

on YouTube from the narratives supplied in this research's findings to check validity or make

interpretations.

While the content being studied is publicly available and any personal information

disclosed by individuals in the hangar flying video stories or viewer comments was done so

knowingly, the researcher acknowledges that there may be some privacy concerns. A possible

privacy concern raised in previous aviation research is that pilots who share information about

their flying may fear legal action taken against them by the Federal Aviation Administration

(FAA), which may deem the pilot's actions to violate regulations and could result in a revocation

of their pilot certificate (Hartley, 2020). Hartley worked with human subjects and addressed this

concern by masking or disguising all identifying information about the pilot. This strategy was

unnecessary in this study as the individuals knowingly volunteered identifying information on a

public platform and surrendered some of their anonymity. The actual names of the storytellers or

the commenters were not integral to this research, as the focus was on the story's content and

comments.

As a Christian, the researcher believes he must conduct his work and speech to glorify

God and show love and kindness to others. Colossians 3:17 says, "And whatever you do,

whether in word or deed, do it all in the name of the Lord Jesus, giving thanks to God the Father

through him" (*New International Bible*, 1978/2011). Further, the Biblical principle guiding this

research is Matthew 7:12: "So in everything, do to others what you would have them do to you"

(*New International Bible*, 1978/2011). These two verses guided the study's ethical approach to

research. The researcher committed to transparency in collecting and evaluating all the data.

**Summary of the Chapter**

The qualitative digital content analysis collected multiple online video artifacts depicting general aviation hangar flying stories to better understand how hangar flying as a communication practice may function as a tool for vicarious learning and personal flying culture development amongst general aviation pilots. The researcher collected 110 online videos depicting hangar flying stories told by general aviation pilots and additionally reviewed and analyzed the viewer comments to gain insights into the communication phenomenon. Transcripts of the video content were analyzed thematically to identify common themes related to perceptions of hangar flying's influence on learning and personal flying culture.

Chapter 3 described the research method and design of this study, along with data collection and analysis procedures. It also described the research questions, setting, sample, and procedures, as well as the researcher's role in the study. Finally, trustworthiness and ethical considerations were discussed. Chapter 4 will discuss the study's findings, answer the research questions, and explore the connections of significant themes.

## CHAPTER 4: FINDINGS

### Overview

This study thematically analyzed the content and viewer comments of 110 YouTube videos depicting general aviation hangar flying stories to better understand how hangar flying as a communication practice may function as a tool for vicarious learning among general aviation pilots. This qualitative content analysis aimed to explore the stories themselves, their central themes, and their purpose, as well as discover any indications of vicarious learning in the viewer's comments that might support how storytelling may build a general aviation pilot's knowledge and influence their flying skills and personal flying culture. This chapter begins with a description of the selected sample, then presents the findings in the context of the four guiding research questions of the study, which will discuss the central themes of the video content and their comments, evidence of vicarious learning connections found, and inferences regarding the primary purpose of the stories.

### Sample

The original research plan mentioned in Chapter 3 called for the collection and thematic analysis of 75-100 online video artifacts containing hangar flying stories. These video artifacts were all collected from YouTube, using search terms like "pilot story," "hangar flying," "aviation story," and "flying story." The digital hangar flying artifacts were collected from December 2023 to February 2024, taking approximately 40-50 hr to complete. The final total number of videos collected and analyzed was 110. At this point, the collection of artifacts had reached a saturation point, and no new data was emerging. The emerging themes became repetitive, and while one cannot rule out other possible themes that may be found in other videos

of hangar flying stories, the researcher believes that the sample collected for this study is a good representation of the communication phenomenon.

The 110 digital artifacts totaled approximately 21 hr of content, with an average viewership of 129,308. The videos selected ranged from a low of 1,100 views with "Radio Failure Landing!" (Taking Off, 2023k) to "I Bought a Cherokee 6 for Less Than $30K and It Changed My Life" (SoCal Flying Monkey, 2020) with over 1.9 million views. Subscribers ranged from a low of 1,400 (Blue Sky Pilot, n.d.) to a high of 541,000 (steveo1kinevo, n.d.). Each artifact in the sample was classified into two types: purpose-built and user-generated. Two additional classifications of digital storytelling were identified: overt and covert.

**Purpose-Built and User-Generated Content**

The hangar flying videos collected for this study were classified as purpose-built or user-generated. Purpose-built content is any communication artifact (i.e., article, post, tweet, video, or other content) often created by a brand to solve a specific problem or fulfill a purpose (Katai, 2023). It is also referred to as *purpose-driven* content. The purpose-built stories were the Air Safety Institute's (n.d.-b) *Real Pilot Stories* series, which included content such as "Engine Failure in IMC" (2011c) and "Hidden Hazard" (2023b). Taking Off's (n.d.-b) *Pilot Stories!* series is also a YouTube channel with purpose-built content, such as "Throttle Stuck on Landing Emergency!" (2023m) and "Cessna Skymaster Wants to Roll!" (2022h). User-generated content is any content, including texts, videos, images, reviews, and more, created by individuals rather than brands or organizations (Beveridge, 2022). User-generated content in the sample consisted of stories from creators such as Missionary Bush Pilot (n.d.), steveo1kinevo (n.d.), FlywithKay (n.d.), Short Field (n.d.), and Blue Sky Flight (n.d.), to name a few. These users often shared experiences and passed on knowledge indirectly and directly.

**Figure 1**

*Purpose-Built vs. User-Generated Content*
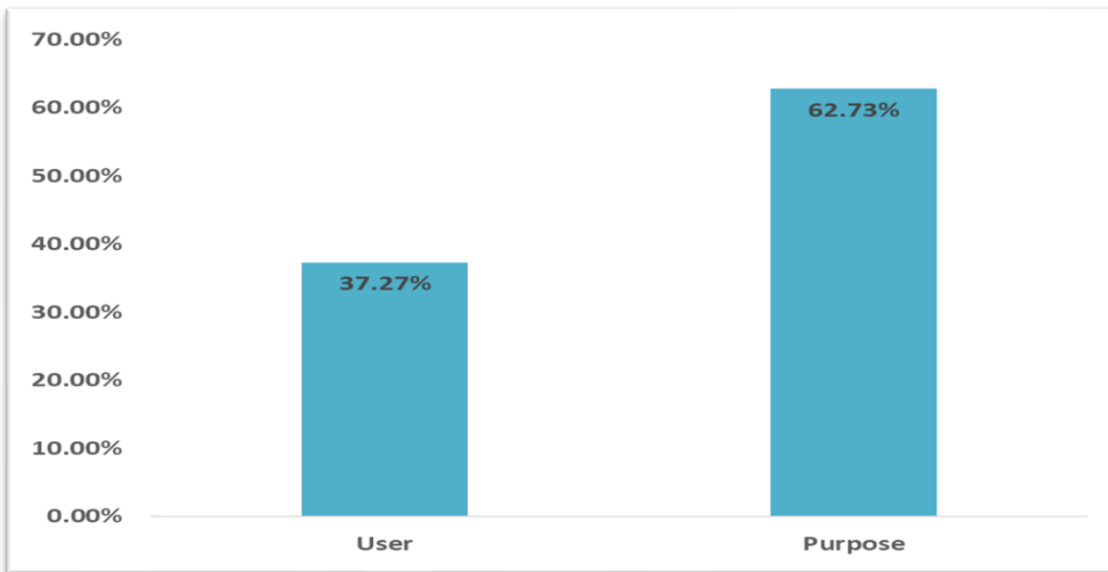


As is common in qualitative studies, findings emerge after the research plan has already been established. While analyzing the selected sample, these two descriptions became less distinct as some user-generated stories selected were found to have explicit purposes. While these remained categories concerning who created them—an organization or individual, an additional way of describing the stories was selected. The researcher named these two categories *overt* and *covert* storytelling.
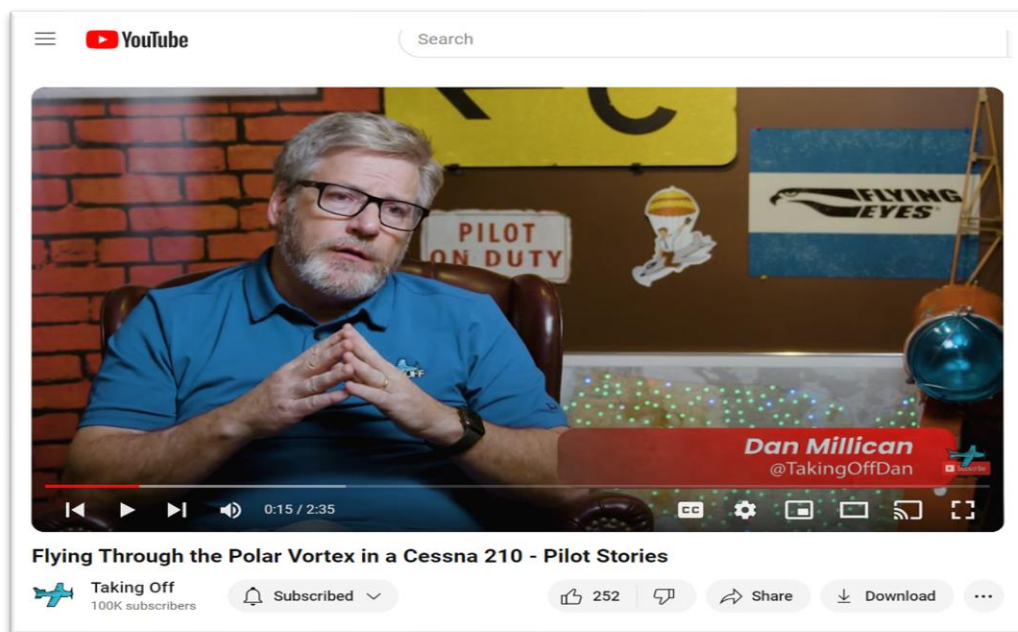
**Overt and Covert Hangar Flying Content**

Overt means "done or shown publicly or in an obvious way" (Cambridge University Press & Assessment, n.d.-c). Using this definition, the researcher named *overt hangar flying content* as that which conveys a specific lesson or message. Overt hangar flying often depicted a single person telling their story to the camera or a usually silent and invisible interviewer. The pilot told the audience an obvious story, just as one would sit at a table at the airport and hangar fly with someone. Often, the purpose was to educate, although there were examples of overt

stories that aimed to entertain. In all overt stories, the story was told from the pilot's point of

view and had a specific purpose to accomplish or point to make. Some video stories wove clips

of simulations of aircraft in situations similar to the story or, in the case of some overt user-

generated content, contained actual footage of the story flight interspersed with their on-camera

storytelling. Examples of overt storytelling come from hangar flying stories like "Real Pilot

Story: Lost Elevator" (Air Safety Institute, 2022a), "Dealing with a Leak Inflight!!! Pilot Story"

(Taking Off, 2023g), and "The Reality of Owning Your Own Airplane" (Airplane Academy,

2021b).

**Figure 2**

*Example Image of Overt Storytelling Content*



Conversely, *covert hangar flying content* is that content in which the purpose or story is

hidden or not obvious. Covert content occurs when a pilot is not directly telling a story but

allows the viewer to share an experience. This type of storytelling was most commonly found in

what the researcher called *ride-along* hangar flying, in which the viewer was an unseen

passenger in the cockpit of a pilot storyteller's aircraft and joined in the experience via cameras

mounted in the cockpit and on the airplane. While this type was usually indirectly educational

and indicated vicarious learning in the comments, it was not overt. Covert hangar flying often

depicts a pilot in the cockpit of an aircraft conducting a flight to a destination during which they

talked to the invisible viewer about what they were doing, the checklists performed, the flight

route, their process of avoiding weather, or how they handled an emergency. Even though the

pilot was indirectly sharing an experience, the researcher considered this an example of hangar

flying and social learning in which the viewer learns vicariously through observing and listening

to the pilot storyteller. Examples of covert storytelling in the sample include stories like "I

Landed My Cessna 150 at St. Barts" (Fly Me to the Fun, 2023a), "I Flew Dangerous Cargo into

the Jungle" (Missionary Bush Pilot, 2024), "On the Job Flying the Mighty Kodiak!-IFR Flight

VLOG" (steveo1kinevo, 2018), and "Crazy Flight Leaving Oshkosh!" (FlywithKay, 2023c).

**Figure 3**

*Example Image of Covert Storytelling Content*
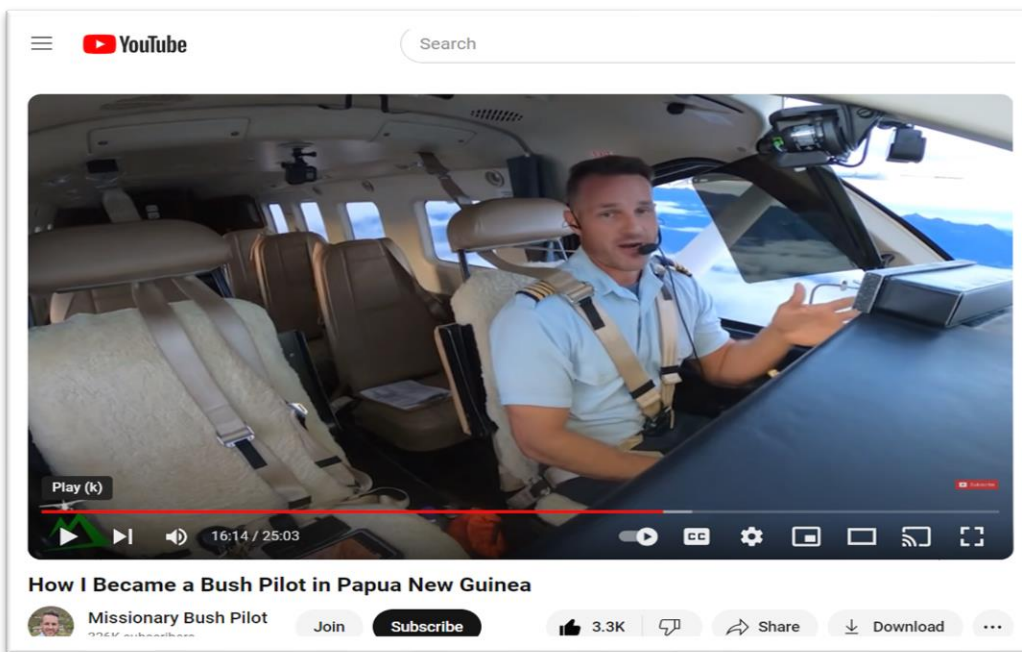
Approximately 86% of the hangar flying stories were considered overt. All of the

purpose-built content created by organizations, as were 24% of the user-generated artifacts, were

examples of overt hangar flying. Approximately 14% of the stories in the sample were

considered covert. All of the covert hangar flying stories were user-generated, and none were

purpose-built.

**Figure 4**

*Overt vs Covert Storytelling Content*
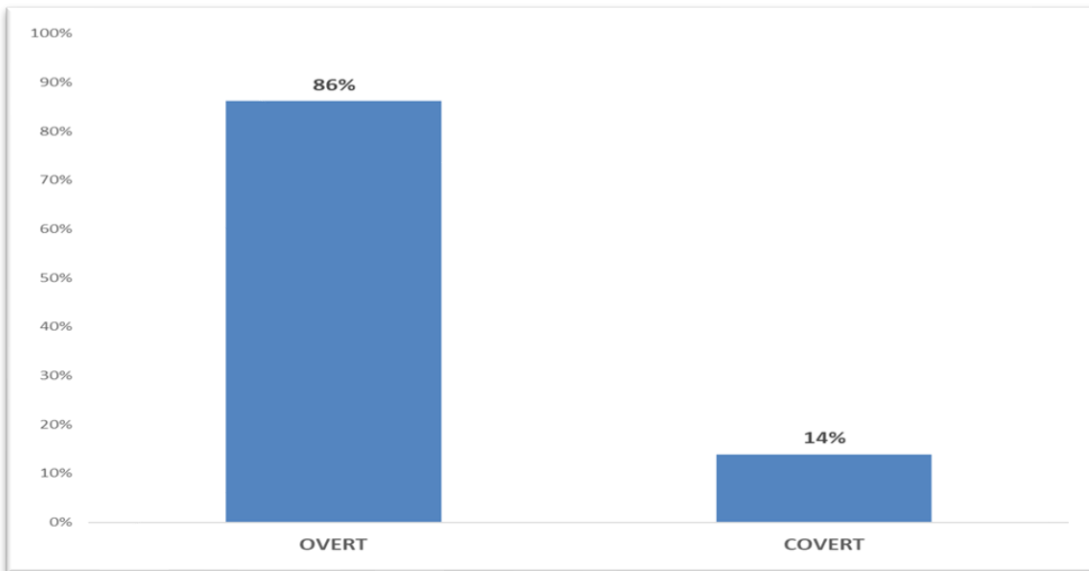


**Thematic Analysis**

Before presenting the results, reviewing the analysis process conducted to produce those

results is fitting. First, online digital videos from the YouTube platform were collected, which

met the criteria outlined in Chapter 3 for a hangar flying story. The videos were required to have

at least 1,000 views and 1,000 subscribers, and viewer comments were to be shown below the

video. The core elements of each video were that it was told from a general aviation pilot's point

of view and that it taught a lesson or shared some experience related to general aviation. The

videos were curated and deemed appropriate by the researcher, who is a certificated private pilot

familiar with digital hangar flying content. It was estimated to collect 75-100 videos; however,

data collection continued until saturation was attained and no new data emerged, resulting in a

total of 110 videos to be transcribed and analyzed. Thankfully, the transcription of the videos

was assisted by YouTube, which automatically transcribed the video content; thus, the researcher

did not have to do this process by hand or utilize computer software as initially planned.

However, the researcher had to carefully review the transcripts and audio from the video to

ensure the text matched. It was discovered that YouTube's automatic transcription did not

always accurately capture the speaker's words and had to be corrected multiple times.

Organizing the data proved to be a challenge. The researcher planned to use a spreadsheet

program but found that creating a database using Microsoft Access was more functional and

simplified the process. The researcher initially created a table within the database and then used

this table to create a user-friendly data entry form displaying text boxes concisely on one

page. Using the form, the researcher could record all aspects of relevant data from the artifacts in

one place, which could be queried easily to find specific data, and it was very efficient. Due to

this helpful system, analysis began nearly simultaneously with data collection. The researcher

also used Hadzy, a free online tool for searching, sorting, and analyzing YouTube comments,

which assisted in the organization and study of the viewer comments (Hadzy, n.d.).

The study utilized Braun and Clarke's (2006) thematic analysis process as a guide for

analyzing the transcribed video content. The first phase involved viewing the videos and

reviewing the transcript to gain some familiarity with the content. Second, initial codes and

patterns were noted and recorded in the database. The third phase in the process was finding

connections and combinations that revealed central themes in the content. These were recorded

in the database as well. Next, the themes were reviewed, modified, and deemed logical. In the

fifth step, the researcher defined the themes and created explanations for each one. Lastly, the

researcher formed a plan for presenting the story of the data, which can be found on the

following pages. This process was repeated for the viewer comments for each video.

**Initial Coding**

Initial codes were developed early in the process and modified as necessary throughout.

The hangar flying stories received codes, including but not limited to "mechanical failures,"

"weather-related," "hazardous attitudes," "aircraft ownership," "aviation is fun," "emergencies,"

"safety is important," and "great lessons." These codes were then analyzed for connections and

combined to form common themes within the video stories. Additionally, the viewer comments

for each video were analyzed to determine overall sentiment and any indications of vicarious

learning connected to the hangar flying story. Coding for the comments included "vicarious

learning," "learning from mistakes is valuable," "safety is the top priority," "gratitude," "inspired

to learn to fly," "never stop learning," and "expect the unexpected." The codes were also added

to and modified throughout the analysis process. The codes were then analyzed for connections

and combined to form common themes.

Additionally, to answer the remaining research questions, the researcher used the data to

make inferences regarding the primary purpose and exigency of the story, as well as possible

indications of vicarious learning revealed in the viewer comments that might show a connection

between hangar flying storytelling and social learning concepts. During the analysis phase, codes

and themes were deleted, modified, or combined multiple times, as was the organizing system

which was also added to and changed to increase efficiency. The researcher estimated that the

analysis process took approximately 60 hr.

## Results

This research study explored hangar flying as a communication practice by analyzing the content of online hangar flying videos and the responses made by pilot viewers. The study aimed to fill communication and aviation research gaps concerning the connection between hangar flying stories and their use as vicarious learning tools in cultivating general aviation pilots' flying cultures. The following questions drove the study:

**RQ1:** *What are the primary themes of the digital hangar flying content?*

**RQ2:** *How do the viewers of the digital hangar flying content respond to it?*

**RQ3:** *What inferences can be made concerning a connection between vicarious learning and hangar flying?*

**RQ4:** *What primary goals of the digital hangar flying content can be inferred?*

The results of this study are presented using the framework of the four research questions. Detailed support for each question, including quotes and excerpts from the video content depicting hangar flying stories, are provided.

### RQ1: What are the primary themes of the digital hangar flying content?

The researcher looked for recurring or stand-out patterns within the videos of hangar flying stories and experiences. During the analysis, multiple themes emerged. However, after review and refinement, five primary themes were identified: a) General aviation can be risky; b) general aviation pilots must prioritize safety; c) general aviation pilots should never stop learning; d) general aviation changes lives and is worth pursuing; and e) general aviation can be fun and provide extraordinary opportunities. Several noteworthy subthemes also emerged from the stories within each of the five central themes. Interestingly, although not unexpected, all of

the content selected for this study contained vicarious learning experiences from which the

viewer could choose to learn.

*Primary Theme 1: General Aviation Can Be Risky*

After organizing the codes and initial themes, the researcher recognized multiple stories

concerning the risks involved in general aviation. Many of the hangar flying stories collected

were centered on the idea that flying airplanes can be dangerous and cause injury or death if not

respected. This finding aligns with previous research reporting the riskiness of flying due to the

high rate of general aviation accidents (National Transportation Safety Board, 2021). The pilots

who told these tales focused on the risks involved in flying aircraft. Although they were fortunate

to survive their storied experience, they often acknowledged that flight has inherent dangers that

must be accepted to engage in this activity. Within this primary theme, three subthemes emerged,

contributing to the concept that general aviation has risks, some of which can be mitigated and

some that cannot. These subthemes and supporting evidence in the form of quotes from the

content are provided below.

**Subtheme 1: Some Things Are Beyond a Pilot's Control.** Many of the stories told by

pilots within Primary Theme 1 discussed the unexpected dangers of flying and the situations and

challenges that cannot be easily planned for but happen, nonetheless. Emergency conditions or

weather-related risks are often unavoidable and spring up without warning, causing the pilot to

mitigate risks, land safely, and walk away alive, all while under great stress to control the

aircraft. Some pilots in the sample recounted unexpected dangers with mechanical failures that

can suddenly become life-and-death situations. Pilot Derick told of this danger: "[I] lost my

entire electrical system in IMC with no warning or no previous indication that I was going to

lose the electrical system" (Taking Off, 2022e, 0:42). Steven told his story of landing his airplane

at full throttle because the throttle linkage had failed and caused him to be unable to control the power: "The engine goes to full throttle because there's a spring in the throttle that when the cable disconnect[s] it goes to full power and that's not what you want on short final" (Taking Off, 2023m, 0:23). In another story, the pilot shared an experience of an inflight fire that occurred in the tiny cockpit of the four-seat aircraft. The fire was caused by a wiring issue in the engine compartment but quickly engulfed the airplane's cabin in smoke and flames. The pilot recounted the dangerous flight, saying, "The only way to fly the airplane, I had to open the door, keep my left foot on the door and keep it open and keep my head outside to see and breathe" (Air Safety Institute, 2011b, 2:23). Although severely burned, the pilot was able to land safely in a field. He further told of the danger of fire in a small aircraft:

> Just lets you know how quick the fire happens in an airplane by the time we had even landed which was probably estimated at 30 to 45 seconds…by the time we had exited the aircraft the entire dashboard was already melting and the whole floorboard was melted including the bottom of our seats so it's very very quick once the fire gets going inside an airplane. (Air Safety Institute, 2011b, 5:39)

*Bird Strikes*. The stories above were emergencies that were out of the pilot's control, and they called for quick actions to mitigate the risks. Adding to these, two stories in the sample shared experiences of hitting birds while in flight, which caused structural damage to the aircraft, injured the pilots, and necessitated emergency landings. Pilot storyteller Gary shared, "The window completely, you know, shattered, and the bird came into the cockpit and hit me on the right side of my face…I was immediately blinded. I could not see out of the right eye" (Air Safety Institute, 2010, 1:38). Similarly, Greg shared that he was flying his RV-7 experimental aircraft when a bird struck and destroyed his canopy: "I remember seeing part of the canopy

gone…my glasses came off, my headset came off, I was unable to read the panel…I became very disoriented" (Taking Off, 2023b, 1:22). Airplanes and birds have to share the sky and while the pilot can control the airplane, those feathered friends do not abide by any aviation regulations. Even though pilots are taught to see and avoid hazards, accidents do happen (Subpart B–Right-of-way rules: Except water operations, CFR § 91.113, 2024).

*Engine Failures*. Another emergency that was the focus of 18 stories in the sample was an engine failure in flight. The researcher discovered that while specific details may have differed from storyteller to storyteller, the main plot was the same. Pilot Robert's engine began making noises during flight, and then he lost power, saying, "I couldn't hold altitude [and] I was descending about one to two hundred feet per minute" (Air Safety Institute, 2011c, 1:59), and the engine was "shaking very violently" (2:09). This situation forced him to make an emergency landing. Pilot storyteller Carl also made a forced emergency landing when his engine failed soon after taking off. He recounted, "The engine quit on takeoff and there weren't a whole lot of options of where to put the airplane" (Grumman Pilots, 2018, 0:30). Unfortunately, Carl sustained severe injuries, again illustrating the possible risk in piloting an aircraft. Carl said, "Nothing south of my belly button works so I'm in a wheelchair right now until the nerves grow back if they ever do" (Grumman Pilots, 2018, 5:42). Bush pilot Trent Palmer told his engine failure story that occurred while flying his experimental Kitfox aircraft over the desert and shared that one can never be fully prepared for an emergency: "I was as qualified as you could possibly get for that kind of scenario and when it happened it scared me more than I thought" (Taking Off, 2023j, 1:19).

*Pilot Incapacitation*. Another story that illustrates some of the uncontrollable and unforeseeable risks involved in aviation is the tale of private pilot Doug White and his successful

piloting and landing of a twin-engine King Air 200 after the pilot in command died during flight (FS Mania, 2022). Doug was not trained to fly a twin-engine aircraft, yet he managed to fly and land the plane safely with the help of air traffic controllers with whom he communicated via radio. Doug's radio transmission said, "My pilot's deceased. I am a single engine pilot low time. I need help! I need a King Air pilot to talk to" (FS Mania, 2022, 16:14). Through the combined efforts of Doug and air traffic controllers, that story had a happy ending for Doug and his family who were onboard. However, it again shows that some dangers occur without warning. The pilot's death was sudden and unpreventable. Doug said, "It's called sudden cardiac death, an electrical problem…he wouldn't have died any quicker if I shot him" (48:48). Adding to the unforeseen occurrences that can happen to the pilot is the tale of Dan's miraculous survival of piloting his airplane while being slowly injured by an unseen hazard (Air Safety Institute, 2023b). Dan shared, "I was being poisoned by carbon monoxide…as you're getting those symptoms your cognitive ability is going down" (6:11). Dan lost consciousness. The airplane crashed, stopping the engine's production of carbon monoxide while also breaking the glass of the airplane's windshield and allowing fresh air to enter. Dan awoke in the crashed airplane, unaware of what had happened and somehow having survived this dangerous situation.

*Weather*. Finally, beyond the emergencies caused by mechanical, medical, and animal issues, there were hangar flying stories about the uncontrollable dangers that weather conditions can cause general aviation pilots. Pilot Terry shared his experience of how the weather conditions changed over the course of his flight and nearly caused an emergency (Short Field, 2022a). The clear sky he was flying in was replaced by many clouds obscuring his view of the ground, causing a loss of ability to pilot by ground references. He shared this lesson: "Conditions that may be fine at one time during the day may not be at another" (Short Field, 2022a, 9:52).

Thankfully, he found a hole in the cloud layer and descended to where he could see the ground. Pilot Vince shares his experience of flying into what he thought was a cloud: "It was a brush clearing fire that was producing smoke and the smoke was so thick that it generated IMC conditions from the ground all the way to altitude" (Taking Off, 2022g, 1:22). This pilot shared that it was essential to "keep tabs on your surroundings" (2:03), as sometimes these conditions can occur suddenly.

Besides clouds, storms, and smoke, cold weather can produce dangerous flight conditions. Another pilot shared his story of encountering sudden icing conditions on a long night flight over the desert of New Mexico: "I knew it was super cooled water in the center of the windscreen which means you're in a cloud and there's probably super cooled water on the airframe, which means you've got, you're going into icing" (Air Safety Institute, 2023c, 7:04). Ice can change the form of the airplane's wings, causing it to lose lift and enter a dive. The pilot faced a dangerous situation, saying, "But then the...the entire windscreen froze over. It was ice. Could not see out the front" (8:02). This story resulted in a crash, but again, the pilot lived to tell this cautionary tale about cold weather conditions during flight.

**Subtheme 2: Small Mistakes Can Lead to Big Consequences.** Pilot mistakes are often due to forgetfulness, adding to the unforeseen dangers posed by mechanical failures, changing weather conditions, and other hazards. Hangar flying stories shared in this subtheme showed how small errors could have or did lead to risky situations. Pilot Institute (2023) determined that over half of all general aviation accidents were due in part to pilot error, although further analysis would need to be completed to determine the exact cause of the pilot error.

In a hangar flying story titled "The Uh-Oh Moments I've Had Flying (And How to Avoid)," the pilot shared the mistakes he has made during his flying life and made a statement

that connects to this subtheme, which was "safety slips in small stages" (Airplane Academy, 2021e, 7:35). He explained that often there is not some catastrophic emergency that happens suddenly, but rather a series of poor decisions or events that add up to dangerous situations. Speaking of one particularly scary story, he said, "I made a series of small compounding errors that led me into a really bad situation" (5:49). He committed himself to landing on a short grass strip even though his approach was too high, too fast, and he was unfamiliar with his surroundings. This story was one example of how small mistakes can negatively affect safety.

Another pilot shared an emotional story in which forgetfulness and complacency nearly led to disaster (Fly With the Guys, 2023). He explained that a simple oversight of forgetting to retract his flaps during a go-around or aborted landing, mixed with high-density altitude conditions, nearly cost the lives of himself and his three children, who were passengers. He told the story as follows: "The stall warning horn keeps going off and uh [I'm] nosing over again …um I finally realized that I forgot to put the flaps up. I was probably 30-ish feet off the treetops and rooftops…it was horrifically terrifying" (4:28). The pilot encouraged the viewer to learn from his mistakes.

Pilot Cody shared a similar story where forgetfulness and a lack of experience caused mistakes that led to a stall-spin accident (Air Safety Institute, 2022b). A newly minted private pilot, Cody loaded up three friends in a four-seat Cessna 172 on a warm evening to do some touch and goes. The combination of too much weight, high-density altitude, and failure to retract the flaps after take-off led to disaster. Cody's small mistakes destroyed an airplane and nearly killed four people. Cody recalled the events:

When I took off, I forgot to put the flaps up…so we climbed out, you know, on a super hot night, thirty degrees of flaps and when I was pulling [the yoke] to try to clear those trees, I most likely lost coordination with the rudder and we entered a stall/spin. (1:49)

Pilot storyteller Jonathan shared a mistake that nearly resulted in an emergency landing because of forgetting to switch fuel tanks during a lesson for an advanced rating (Taking Off, 2022a). Jonathan recounted, "I'm doing timed uh timed uh turns and I'm not paying attention that the instructor is actually using the transponder timer to time those terms for me" (0:40). Normally, Jonathan used the timer feature of the airplane's transponder to time the switching of his fuel tanks from right to left. However, the instructor had been using the timer on this flight for other reasons but did not tell Jonathan about it. Unfortunately, this small mistake led to starving the engine of fuel, causing the engine to fail and prompting the preparation for an emergency landing. Eventually, the mistake was rectified, the tanks were switched, and a crisis was averted.

Finally, as shared in the video "Real Pilot Story: Underwater Escape" (Air Safety Institute, 2013), a lack of flight planning for obstacles, flying into the sun, and an unnecessarily low flight over a river were mistakes that led to the pilots nearly striking electrical wires and crashing into the water. The airplane flipped over and filled with water. However, the two pilots were able to escape. The pilot recounted in the story that the water rushed into the cockpit, and he had only seconds to get out and save his unconscious friend. Again, this story shows that small mistakes and pilot errors increase the risk of flying. The pilot told the audience that aviators should be prepared for an underwater escape. However, most are never trained for it. He said, "Underwater escape is foreign to most people and there's often very little room for error if you don't get it right the first time. There may not be a second chance" (13:12).

Other small mistakes shared in hangar flying videos included using the incorrect radio frequency to communicate with air traffic control and forgetting checklist items, among others. These small errors have the potential to have large consequences. However, in the above stories, the pilots all survived to share their stories in these digital hangar flying sessions.

**Subtheme 3: Hazardous Attitudes.** A common theme in several artifacts was the danger posed by the pilot's mindset, which often led to or compounded poor decisions and mistakes. These hazardous attitudes were seen in stories from novices and experienced pilots, showing that no pilot is immune. The Federal Aviation Administration (FAA) lists five hazardous attitudes that can interfere with a person's ability to make good decisions and perform tasks safely while flying (Federal Aviation Administration, 2023b). These attitudes are anti-authority, impulsivity, invulnerability, macho, and resignation. Aviation is a risky activity made all the riskier by these attitudes. The FAA also lists antidotes to each hazardous attitude, which, if quickly recognized, can help the pilot avoid making poor decisions that could result in loss of life.

**Figure 5**

*Five Hazardous Attitudes*
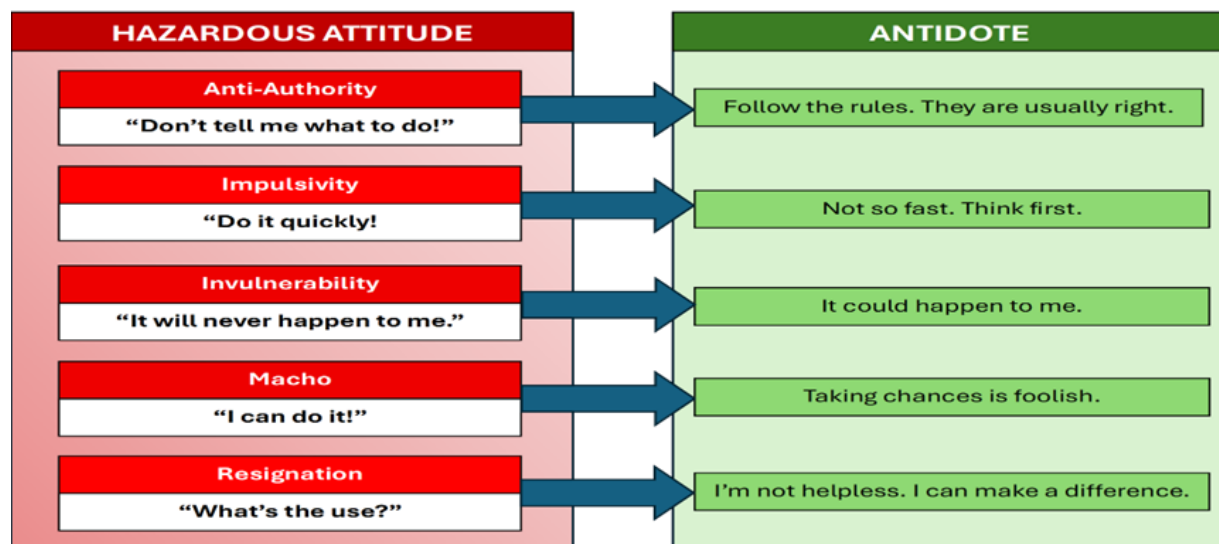


*Note*. Adapted from Figure 2-4 (FAA, 2023b, p. 2-5).

Hazardous attitudes were seen in several of the hangar flying stories selected for this study, and the pilot storytellers readily admitted their errors and often implored fellow pilots to learn from their mistakes and avoid these states of mind that only serve to make general aviation unsafe. The macho hazardous attitude is one in which pilots believe that they can accomplish whatever they want and do not need help. This attitude often causes pilots to take risks to prove themselves or impress others (Federal Aviation Administration, 2023b). An additional hazardous attitude that may be linked to macho is what psychologists call *plan continuation bias,* more commonly known by pilots as *get-there-itis* (Federal Aviation Administration, n.d.-b). This attitude is the pressure a pilot may feel to continue or complete a flight, even in the face of dangerous weather, personal stresses, illness, or other red flags. The pilot feels compelled to complete the mission and ignores anything distracting from that goal. Unfortunately, this macho hazardous attitude can result in accidents, injury, and death.

One pilot made a series of poor choices fueled by this hazardous attitude that ended in a crash in the Idaho mountains, threatening the lives of himself and his passengers (Air Safety Institute, 2015). In his hangar flying tale titled, "From Miscue to Rescue," the pilot, who was only certificated to fly under visual flight rules, admits that despite increasingly poor weather around him, he continued the flight. At the same time, doing so became riskier and riskier. He said, "I was basically at a point where I was scud running, I was just about a thousand feet above the terrain and just under the cloud layer" (4:51). The pilot also admitted to succumbing to get-there-itis saying, "I know that that mission-driven mindset made me take some risks that I wouldn't have normally taken here. I found myself just slowly and slowly being convinced that this flight was still safe enough to continue" (17:44). His hazardous attitude resulted in the

destruction of his airplane, severe injuries to himself, his wife, and daughter, as well as a massive

30 hr rescue operation to locate them.

Pilot Josh shared his story of letting this hazardous attitude of get-there-itis get the best of

him, even though he feels he should have known better (Taking Off, 2023a). On a long trip, Josh

was eager to get home and chose to continue his flight despite dangerous thunderstorms near him

and his gut feelings that he should stay on the ground. He told the viewers about quickly going

through his pre-flight checklist, barely checking things, "I am on the takeoff roll [and] I am

thinking about the fact that this was probably not a great decision…I was in a hurry to beat this

weather so that I could get on my way and make it home" (5:37). Later in the story, Josh speaks

to his macho get-there-itis attitude:

I let my get-there-itis make the decision for me and I let my ego get in the pilot seat after

that decision was made and I said it might be a little bit windy might be a little bit bumpy

I can handle this, but that scared me, and that was a dumb decision. (8:57)

Josh survived his encounter with get-there-itis and made it home; however, it could have easily

ended in tragedy.

Several other hangar flying stories in the sample contained the macho hazardous attitude,

specifically concerning get-there-itis. This state of mind, mixed with arrogance, forgetfulness, or

complacency, can be dangerous, as one pilot discovered after picking up his airplane from annual

maintenance (Taking Off, 2022h). Because the pilot was in a hurry to outrun an impending

severe thunderstorm, he did not perform his routine pre-flight checks, ignored his checklists, and

took off into the stormy night. Due to his admitted arrogance, he did not check the fuel selectors

to see that the engine was only feeding from one tank, which he ran dry, causing the airplane to

roll violently to one side, nearly losing control. His advice to others is, "So follow your checklist,

don't be a dummy. I was so immersed in what was going on [I] never looked at the gas gauge on the checklist" (2:51).

Other hangar flying stories reported the other end of the spectrum for hazardous attitudes: resignation or helplessness. A few pilot stories told of emergencies in which the pilot felt as if nothing could be done to save themselves and nearly gave up. A story mentioned previously of Greg and his bird strike also shared the danger of this hazardous attitude: "When you get into that life or death or a super intense situation um there is a natural tendency to just give in and give up and resign yourself to what you think is the inevitable" (Taking Off, 2023b, 13:48). Instead of giving up, Greg chose the antidote of this hazardous attitude, which was in his words, "Screw this I'm gonna do something about it" (4:16). He was able to gain control of himself and the aircraft and land safely. He encouraged others to learn from this experience and not fall victim to resignation in these situations.

Other stories that were illustrative of pilot error contained elements of several hazardous attitudes along with the dangers of complacency, inexperience, and poor decision-making. Complacency, invulnerability, and a dash of get-there-itis caused Pilot storyteller Dan to ignore his body's symptoms of carbon monoxide poisoning during a flight and nearly cost him his life in a crash (Air Safety Institute, 2023b). A macho attitude mixed with inexperience nearly killed another pilot when his engine and landing gear failed during his flight (Taking Off, 2023d). A mix of macho, complacency, and poor decision-making created a dangerous situation for Terry when he continued flight into worsening weather conditions, of which he admitted that "this was a true error of judgment" (Short Field, 2022a, 10:25). He learned many lessons from his misadventure which other pilots can learn as well. One of those is worthy of ending this section:

"Never put yourself in a position where you are forcing yourself to do things that you would not normally do had you had more time" (9:42).

### Primary Theme 2: General Aviation Pilots Must Prioritize Safety

As noted above, many hangar flying stories focused on the risks involved in general aviation operations. In addition, many of those specific stories also had elements focused on the importance of safety during flight operations. In fact, most of the videos in the entire sample contained some safety-related aspects. This finding is sensible and aligns with the Federal Aviation Administration's view that safety is the highest priority in aviation (Federal Aviation Administration, 2019). One organization, the Air Safety Institute (Air Safety Institute, n.d.-b), has a hangar flying video series, *Real Pilot Stories*, featured in this study. In addition, the channel features multiple videos analyzing aviation accidents, all focused on providing pilots with free safety education.

The hangar flying stories organized around this primary theme shared a central thread that prioritizing safety meant that pilots must exercise safe practices while acting as pilots in command. While not all of the specific practices mentioned in the stories will be shared here, these included things like avoiding hazardous attitudes, understanding the effects of density altitude, avoiding thunderstorms, and carrying emergency equipment in the airplane. Four of these practices were often repeated and have been included here as subthemes to inform and support the primary theme of safety.

**Subtheme 1: A Safe Pilot Must Exercise Good Aeronautical Decision-Making.** In several stories, the pilot storytellers mentioned the importance of good decision-making as an essential quality of a safe pilot. Further, they believed their ability to make sound decisions when faced with emergencies, poor weather, or other risks was why they survived their sometimes

dangerous stories. Pilot Josh decided to abort his takeoff when the winds suddenly grew strong

and shifted directions, robbing the airplane of the lift needed to leave the ground safely

(Aviation101, 2015). Although tempted by the hazardous attitude of macho pride, he talks about

how he knew he made the right decision to abort the takeoff: "Pride can kill…I did not hesitate

to err on the side of safety so I made the executive decision to abort the takeoff without wasting

another breath or another foot of precious runway" (7:48). Had he continued the takeoff, Josh

recounted that he would have likely crashed into the terrain beyond the airport. Josh continued in

the story to share the lesson that he hoped all would learn from his story, which is to make good

decisions when flying because your life is at stake: "Being a pilot in command means you must

swallow your pride and make the right decisions because those decisions will most likely save

your life as well as your passengers" (7:51).

Another example and lesson of the importance of good decision-making comes from

another user-generated video. In this video, titled "Give Me a Brake! Brake Problem In My

Airplane!" (FlywithKay, 2023a), pilot Kay is following procedures and testing the brakes in her

Piper Cherokee before taxiing for a local flight when she notices one of her brakes is not

working well. This video is a covert story where the viewer "rides along" with the pilot on a

flight without any overt storytelling. Kay tells the camera that she has decided to take the

airplane to her mechanic to check the brakes, where a minor mechanical issue was discovered

and fixed. Kay's good decision focused on keeping the safety of the flight paramount and

indirectly taught the pilot viewer to do the same. She recounted, "While I continued taxiing, even

though I was still able to use my brakes, something just felt off, and I decided I wanted peace of

mind more than I wanted this flight so I canceled my trip" (1:59). The problem was minor—

some air bubbles in the brake lines, and her decision to fix rather than ignore the issue is something all pilots can vicariously learn.

Choosing safety over impulsivity or pride is apparent in several hangar flying stories in the sample and is often referred to as directly opposing these hazardous attitudes. Pilot Charlie attended a fly-in event at an uncontrolled grass runway, where the traffic pattern became very busy when he was ready to leave (Airplane Academy, 2021d). He had to risk taking off in precarious conditions or wait until fewer airplanes were flying around. Even though feeling pressured to move quickly, Charlie decided not to give in to hazardous attitudes and chose to make decisions that kept him and his passenger safe. He said, "I just really had to check myself and slow down and say 'like hey you're in the moment here, but you are going to stay safe, we're not doing anything aggressive'" (2:22). He left the pilot viewer with a lesson about making good decisions: "We don't have to be forced into anything" (5:54), and "just slow down there and take charge of your own safety because no one else is in charge of keeping you safe other than you" (7:16).

**Subtheme 2: A Safe Pilot Must Maintain Situational Awareness.** Situational awareness refers to the pilot's perception of the airplane's environment, systems, and other factors relevant to safe flight and comprehending their meaning and influence upon one another (Endsley, 1999). Hangar flying stories shared in the sample referred to maintaining situational awareness as a significant factor in ensuring flight safety. Situational awareness was shown in the examples mentioned above concerning good decision-making, as Pilot Josh had to be aware of the wind's effects on his airplane and the risks involved so he could make a safe decision (Aviation101, 2015), and Charlie also had to maintain awareness of the busy airspace around

him as well as on the ground to make the safest decisions for his operation (Airplane Academy, 2021d).

Another example comes from the story of pilots who, unfortunately, did not practice good situational awareness, and one was fatally injured in the crash of the aircraft after it encountered wake turbulence near the ground (Taking Off, 2022d). Two Blackhawk helicopters had just departed the airport and had created significant rotor wash, causing the storyteller's inbound Cessna 182 to be violently tossed around, ending in a crash. The pilots were aware of the helicopters but did not maintain situational awareness of the environmental factors of the wake turbulence and its influence on their light aircraft. The surviving pilot said in the story that what happened was unexpected: "We didn't expect it, I mean nobody expected it" (1:20). Although the helicopters had just departed, and the tower had cleared their Cessna to land, the pilot passenger said, "You know it [the wake turbulence] was still around. We didn't really realize that" (1:28). The storyteller advises the viewer to avoid encounters like his and not make the same mistake.

Adding to the example above, the Missionary Bush Pilot (2023) shared in one of his covert-type ride-along video stories about the importance of maintaining situational awareness while flying through mountains and unfamiliar territory. As a pilot in Papua New Guinea, he regularly flies at low altitudes, in clouds, and near mountains but has gained great familiarity and awareness of his flight environment. He said, "I would never do this unless I knew the terrain, unless I've flown it 150 times or more type of thing . . . so I know exactly what the mountains look like I know what the weather's expecting to do" (22:46). He encouraged being familiar with one's flight path and visualizing what to expect as things new pilots can learn to stay situationally aware and safe.

The last example of this subtheme is found in a story titled "Into the Dark," in which an instrument-rated pilot lost visual references at night over the Atlantic Ocean (Air Safety Institute, 2023a). The pilot took off from a well-lit airport but soon was over the ocean without any markers of the shoreline, stars, or other visual references. He became spatially disoriented, lost situational awareness, and nearly stalled and spun the airplane. He tells the story: "But as soon as the last of the runway lights disappeared under the cowling of the 172...I was really startled by the loss of all visual references" (0:42). He continued, "The next thing I remember was noticing that my pitch was 18 degrees nose up approximately….at that moment I realized that that I was really getting myself into a dangerous situation" (1:47). His takeaway and advice for pilot viewers of his story is to maintain situational awareness of your airplane and environment, including the airport, runways, and surrounding terrain of where you are departing and landing. The pilot shared,

> My recommendation to other pilots from flying to new airports is to get familiar not just with the field itself but with the surroundings and particularly at the times that you expect to be arriving or departing. Be mindful of scenarios where you can lose your visual references even though the weather might be solid VMC, as was the case during my flight. (2:27)

**Subtheme 3: A Safe Pilot Must Stay Calm and Fly the Airplane.** Again, within the primary theme are multiple stories with overlapping subthemes. In Subtheme 2, the focus was on maintaining situational awareness to ensure safety while flying. However, a connected subtheme that emerged in some of the above stories and others was the mantra: Stay calm and fly the airplane. The principle meaning behind this phrase is to maintain positive control of the airplane at all times, no matter what the circumstances. A possible origin of this concept comes from Bob

Hoover, a famous aviator, who often gave this advice to new pilots: "When faced with a forced landing, fly the airplane as far through the crash as possible" (Dailey, 2016, para. 5). The point was to continue to control the airplane as long as one possibly can, and so keep everyone in the air and on the ground as safe as can be. Thus, several stories featuring this subtheme also featured emergencies or other dangers during flight.

For example, in a previously mentioned story regarding a bird strike, Pilot Gary recounted from his dangerous encounter, "One of the things that I learned from this is fly the airplane; no matter what just keep flying" (Air Safety Institute, 2010, 5:56). Coincidentally, in another bird strike story in the sample, Greg believed he survived his emergency by telling himself to "just slow down because I was starting to amp up and I said all right what do you do? Fly the airplane" (Taking Off, 2023b, 11:54). As another pilot emotionally recalled during his story, words he had heard during flight training came to him while he faced an electrical failure at night in instrument meteorological conditions (IMC):

> I heard the voice of the flight examiner that did my IFR, he [said] 'fly the plane, fly the plane' and I swear I heard his echoes 'fly the plane' so that's what I did, fly the plane, don't worry about the rest (Air Safety Institute, 2019, 9:22).

In all of these stories, the pilots remained focused on maintaining control of the airplane and survived their respective emergencies. Additionally, in these stories and the several other examples not included here, the pilots all wished to pass on the importance of maintaining calm minds and simply focusing on controlling the airplane when faced with the unexpected.

**Subtheme 4: A Safe Pilot Is a Prepared Pilot.** The hangar flying stories sorted into this subtheme share elements with the previously mentioned subthemes; however, they held some distinctions to be grouped into a separate category. Stories in this subtheme focused on how

pilots could better mitigate any risks of their flights by ensuring that they were well prepared for

emergencies or other possible hazards that might arise. One example is ensuring that there is a

working fire extinguisher on board the aircraft and that the pilot and passengers know where and

how to use it. In the story of an in-flight fire, the pilot discovered that a fire extinguisher had not

been placed in the airplane, which would have been helpful in that emergency (Air Safety

Institute, 2011b).

The survival story of a Mooney pilot who was forced to ditch his airplane into the Gulf of

Mexico at night after an engine failure illustrated the need to have proper emergency equipment

in the airplane (Air Safety Institute, 2011a). Although the pilot did have life jackets onboard,

they were not outfitted with whistles or lights, which would have aided in a faster rescue for him

and his passengers from the dark waters. Advising pilot viewers to learn a lesson from the story,

the pilot added, "Be prepared for these things and have adequate safety gear on board including

that life vest for every person and whistles and lights" (6:54). This story also illustrated the

importance of using what is known as *VFR Flight Following*, which is a service that air traffic

controllers can provide on a workload permitting basis that allows a pilot's aircraft to be tracked

on radar without filing an instrument flight plan. Usually, radar service like this is reserved for

pilots with an instrument rating who have filed a flight plan. The pilot in this story was prepared

and utilizing this service: "I was constantly in contact with Miami Center for flight following"

(0:58). Due to using flight following, the air traffic controllers were immediately aware of the

crash and dispatched rescue teams within fifteen minutes of the pilot's mayday transmission,

which improved the chance of survival.

Conversely, in the story "From Miscue to Rescue" (Air Safety Institute, 2015), the pilot

usually requested flight following on long trips but did not do so in the incident story, which

increased the length of time and difficulty in finding and rescuing him and his passengers. Rescuers did not begin looking for the victims until nearly three hours after the crash. The pilot admitted, "If we'd been using flight following that notification time that from the time we crashed to the time people started looking would have been even narrower" (19:53). His story also supported the need to be prepared with proper emergency equipment in the airplane to increase survival chances.

Other stories in this subtheme shared the importance of being familiar with the aircraft's systems; having backup systems, such as handheld radios, paper charts, and cellular telephones, in case of equipment failures; and being familiar with the airports one uses. The pilot in the bird strike story was very familiar with his aircraft systems, so even though he could not see clearly due to the loss of his glasses, he was able to land the plane safely (Taking Off, 2023b). The pilot who lost his electrical and communication system at night could stay in contact with air traffic controllers via his cell phone, although he wished he had had a backup radio (Air Safety Institute, 2019). Finally, Pilot Dave advised viewers of his story to be familiar with the airports one uses, primarily one's home airport, as he felt that his successful completion of a 180-degree turn back to land on the runway after an engine failure was due to his familiarity with the airport (Air Safety Institute, 2016b).

The hangar flying content in this primary theme focused on the concept that general aviation safety is of paramount importance and that pilots must prioritize safe practices in every flight they embark upon, ensuring they are prepared, make good decisions, maintain situational awareness, stay calm, and fly the airplane at all times. This finding illustrates the importance of safety within general aviation, as much of the digital hangar flying content was focused on sharing mistakes and mishaps to prevent other pilots from committing the same errors. If the

author had prioritized this safety theme, he would have been far more prepared to cross those military traffic routes, as mentioned in his hangar flying story in Chapter 1. Now, the findings turn to the third primary theme, which is connected to the prior ones.

*Primary Theme 3: General Aviation Pilots Should Never Stop Learning*

This theme was seen nearly as often throughout the sample as the need to improve safety. The themes of education, learning, and knowledge building were found in approximately 75% of the stories in the sample. This theme is also strongly connected to the previous primary theme of safety, as learning new skills or becoming more proficient were directly related to being a safer pilot. Harnagel (2021) found that pilots must continue learning beyond earning certificates to maintain proficiency and suggested that proficiency was the key to reducing general aviation accidents. Although these concepts and stories could have been listed as a subtheme of Theme 2, the researcher felt that learning from the stories of other pilots, their mistakes, and successes was worthy of its primary theme categorization and felt that the sample provided evidence to support this choice.

Interestingly, the researcher found that in most of the videos in the sample, the story's primary purpose was to teach a lesson or pass on knowledge to the viewer. While these stories recount some experience, a straightforward lesson was often taught to the viewer, who was assumed to be a pilot. The presentation of findings for Research Question 4 will discuss the storyteller's purpose more.

**Subtheme 1: Learn New Skills and Stay Proficient.** Several stories in the sample illustrated the importance of gaining new piloting skills, adding ratings, flying in different aircraft, and practicing procedures to increase knowledge, mitigate risk, and improve flight safety. Aviation YouTuber and pilot, whose username is steveo1kinevo, often shares his

experiences flying various aircraft, from the TBM 850 to Kodiaks (steveo1kinevo, n.d.). Most of

his content is covert storytelling, in which the viewer is along for the ride, learning primarily

through observation. In one episode, steveo1kinevo shares his experience receiving training in

the Cessna Caravan via a flight simulator, illustrating the need for all pilots to maintain

proficiency in their skills and learn new ones (steveo1kinevo, 2017). He takes the viewer along

for the ride in the simulator, in which he shows how to handle various emergencies, including a

mechanical failure of his elevator control, which causes him to have to use trim to maintain

pitch. He remarked that it was a difficult challenge: "But to lose your elevator control and have

to land an airplane just off your manual trim is probably one of the hardest things I've ever had to

do" (15:21). He went on to talk about how such emergencies are often not scenarios a pilot trains

for, but that the simulator allows pilots to practice such scenarios safely.

Pilot Charlie (Airplane Academy, 2020) shared the new things he is learning about in

aviation after 700 hr of logged flight time, all while encouraging others to try and learn new

things. He shared his personal aviation goals and deficiencies in his flying that he wanted to

improve upon, which included gaining more flying time in actual instrument conditions and

increasing his maintenance knowledge. He further encouraged all pilots to learn new skills, add a

rating, and hone their proficiency. He said,

> I encourage you to plan your next trip, it doesn't have to be 1500 miles; it can be 15
>
> miles, just go try to experience something new because there's so much that we can learn
>
> from it anytime we do. (4:09)

He hoped his story encouraged other pilots to know that even though he has 700 hr as a general

aviation pilot, he still strives to improve his knowledge of airplanes and flying. His story

illustrated that being a pilot is a constant journey of learning and experiencing and that it is okay

to make mistakes, talk about them, and work to improve one's skills. In an attempt to continue the vicarious learning process, he encouraged the pilot viewers to share comments about what things they were learning about in their flying journeys to encourage and enlighten others:

> I really sincerely would love to hear from you down in the comments what are the top three things that you're learning right now…I think it'd be really helpful for pilots all along the spectrum to hear what people are learning at the various stages (Airplane Academy, 2020, 10:00).

Charlie's overall goal with his YouTube channel is to promote general aviation and encourage others to join the flying community, learn from each other, and fly safely.

In "Airplane Near Death Experience? Stall Spin Crash!" (Texas Outdoor Ventures, 2022), the pilot storyteller also encouraged others to continue to watch videos, read, and learn so that they can stay alive if ever in a dangerous situation like his. The pilot shared his story of nearly crashing his airplane at the Oshkosh, Wisconsin AirVenture Air Show due to an inadvertent stall-and-spin situation. He discussed how pilots need to continue to learn and practice maneuvers and emergency procedures: "This is why we practice things, we practice our maneuvers, we practice emergency situations, so that when we get into those situation[s], hopefully, we instinctively react to them" (3:56). He had studied a video of another pilot who encountered a similar situation but did not survive the accident. In an example of vicarious learning, this pilot learned from watching the video what he should and should not do in a stall-and-spin situation and then used that information to save his life. The pilot believed it was this commitment to continued learning and practice that saved him, saying, "I think my study of this particular event helped save my life in Oshkosh" (2:12).

Other pilots shared hangar flying stories related to continued learning, from earning

additional ratings to fly different kinds of airplanes to learning their aircraft well. One pilot

shared the experience of earning advanced ratings like the seaplane rating and commercial

license (Airplane Academy, 2021c, 2023b), while Pilot Clark encouraged pilot viewers to get an

instrument rating so that they could better handle emergencies like he faced when flying over

water at night and losing all visual cues (Air Safety Institute, 2023a). Another pilot learned more

about his aircraft from an experience of being locked inside it without a way to get out (Fly With

Bruno, 2021). The story ended happily, thanks to the help of some fellow aviators who chose to

land at the airport and rescue him. The pilot learned valuable lessons about the locking

mechanism on the canopy of his Grumman Cheetah and then encouraged pilots to take the time

to learn about their airplane and its various systems because it can make the difference in

emergencies. Finally, JC's story encouraged pilots to imagine emergencies, have a plan, and

always look for opportunities to learn more because they never know when a piece of

information will save their lives (Air Safety Institute, 2011b). He said,

> You never know where you're going to learn what you need to do, it could be from an
>
> instructor, it could be from reading a magazine, but I think having a key point in your
>
> mind saying if this ever happens to me I'm going to do this. (6:45)

**Subtheme 2: Learn From Others' Mistakes.** Aligning well with two of the guiding

theories for this study, social learning and social cognitive theory, the hangar flying stories

organized in this subtheme encourage pilots to learn from the mistakes made in the story so that

they are not repeated, which, as noted earlier can increase the safety of all aviators. Both theories

posited that humans learn from observing others' behaviors and then decide whether to imitate or

reproduce those behaviors (Bandura, 1977, 1986). There are rewards and punishments for these

various behaviors, and through vicarious learning, humans understand what actions and

behaviors should be imitated or reproduced and those to avoid. The stories within this subtheme

share an experience, lessons learned, and advice or warnings to the pilot viewers so they can

choose to reproduce or avoid a repeated experience. The storytellers often advise pilot viewers to

remember their story to be more prepared and safer in their own flying endeavors.

The researcher acknowledges that many of the stories previously discussed contained

pilot errors from which all pilots could learn. However, the stories specifically organized in this

subtheme contained a more direct message about learning from the storyteller's mistakes. For

example, the pilot in the video "Real Pilot Story: The Impossible Turn" (Air Safety Institute,

2016b) specifically told the viewers to avoid repeating his actions. The pilot experienced an

engine failure on takeoff and was only 500 ft above the ground when he decided to turn back and

attempt to land on the runway. This choice was a dangerous gamble as the airplane was slow

and, without the engine, would lose altitude rapidly, which resulted in a high probability that the

pilot would not make a safe landing. The pilot even expressed his reservations about sharing the

story: "My only hesitation about putting this out there for other people to see is that they say,

well if he did it I can do it—my advice to other pilots is don't do what I did!" (0:42). In the

video, the pilot acknowledged that he was fortunate to survive and advised viewers to take a

different course of action, as they would have better chances of survival if they did not imitate

his experience. He said, "I took a chance, and I was fortunate to make it successful, but your

chance is much greater just finding a place straight ahead [to land]" (7:34).

Like all the pilots in this subtheme, pilot storyteller Bob chose to publicly share his

mistakes with the viewer in the hopes that others would learn from his experience and not repeat

it (Blue Sky Flight, 2023). Bob's story involved mistakes he made flying into the largest air

show in the world, the Experimental Aircraft Association AirVenture in Oshkosh, Wisconsin. In the busy airspace, Bob misunderstood the air traffic controllers' instructions, inadvertently cut others off in the traffic pattern, and was forced to abort his landing when there was insufficient spacing to land safely behind another airplane. Due to the confusion, Bob also entered a no-fly zone reserved for ultralight aircraft; had any of those been operating, his actions could have resulted in a mid-air collision. Bob admitted his mistake and shared, "The whole idea behind doing this video is to raise awareness, again I'm taking full responsibility for the mistake. I'm only pointing out what led to the mistake because it can happen to anyone" (34:56). Bob told the viewers, "I thought it was very important that I take a deep dive into exactly what I did wrong to make sure that no one else makes that same mistake" (2:27). The pilot, although making himself available to public criticism, did so to help others avoid what could have been a life-threatening event. He advised others to be mindful of other aircraft and heed the instructions of the controllers to keep everyone safe but also offered to continue the conversation: "If you think there's anything else that I may have missed out on or anything else I should point out [I'm] happy to respond to that" (38:29).

As previously mentioned, the pilot who made risky mistakes while landing at the Oshkosh Airshow nearly stalled and spun his aircraft into the ground (Texas Outdoor Ventures, 2022). With a stall-and-spin scenario imminent, the pilot is able to recover and execute a go-around, landing safely on his next attempt. The pilot said he knew what to do because of his vicarious learning through watching a video of another pilot's stall-and-spin accident that unfortunately did not turn out well. He said, "I think the intent is actually to learn as much as we possibly can from these events to prevent them in the future" (2:07). This pilot is an example of someone whose life was saved due to his learning from another pilot's fatal mistakes.

Pilot storyteller Bryan shared what not to do when practicing soft field takeoffs (Taking Off, 2023h). Sarah told the viewers not to repeat her mistakes of attempting to fly through or "thread" her way through dangerous thunderstorms (Taking Off, 2022f, 2:19), and Pilot Charlie admitted many of what he called "uh-oh" moments that he had experienced in flying and how others should learn from him and avoid those mistakes (Airplane Academy, 2021e). These pilots advised viewers to learn from them and their hangar flying stories.

These stories focused on the ongoing learning process pilots must engage in to stay proficient and improve their flying skills. Whether from practicing maneuvers, preparing for emergencies, gaining new ratings and skills, or learning from others' mistakes via digital hangar flying on YouTube, the goal is to become a better, safer, and more knowledgeable pilot. Jason Schappert, another aviation YouTuber who runs the website MzeroA.com, has built his aviation education business around the mantra, "A good pilot is always learning," and this saying seems to be an excellent summary of this primary theme and its subthemes (MzeroA.com, n.d., para. 7).

### Primary Theme 4: General Aviation Changes Lives and Is Worth Pursuing

The stories organized into this category focused on the concept that aviation is an amazing thing that can change lives, save lives, and allow individuals to experience the world in a unique way. The storytellers often emphasized that flying or owning an airplane could provide many opportunities for fun, adventure, and unique experiences. Several aviators attempted to inspire others to learn to fly by sharing their journeys to the pilot's seat or simply by expressing their love for aviation through their stories. Others shared stories of the many ways airplanes can be used, including adventures to tropical islands and humanitarian missions. Still, others discussed the joy of aircraft ownership and told their stories about buying and owning an airplane. Some shared unique experiences they have had with aviation that were often

entertaining and occasionally educational. Thus, stories in this theme shared the positive side of

flying, promoted general aviation, sought to inspire others to learn to fly, and shared some of the

unique experiences one can have.

      **Subtheme 1: Inspiring Others to Fly.** Stories in this subtheme shared the love of

aviation and strove to inspire others to become pilots. Encouragement and motivation were also

elements of this hangar flying that focused on helping current and prospective pilots pursue and

persist in achieving their goals. One pilot and YouTuber (Airplane Academy, 2023a) wanted to

encourage more people to learn to fly and told his story of a struggle he faced in flight training,

assuring the viewer that if flying is something they want to do, then they should understand that

"aviation is worth pursuing, it is worthy of your time and your interest" (4:37)  and to know that

"you are not alone" (5:25) in the journey.

      As a means of inspiring others to learn to fly, some pilots in this subtheme shared their

aviation origin stories or how and why they learned to fly. Pilot storyteller Koby shared his story

of why he learned to fly: "I knew 30 years from now that if I didn't do this that would be my

greatest regret in life was not flying airplanes" (Fat Tire Cowboys, 2019, 2:19). He further

described his reasons: "Being up in the air, being free, you know, looking down, your problems

seem to shrink with the rest of the world, time literally slows down; there's no better feeling"

(1:19). Other pilots also shared their journeys to the cockpit from humble beginnings to where

they are now in the hopes of inspiring others to pursue flying as either a hobby or career (The

Fire Pilot, 2021; Huber, 2019).

      Pilot Eric also shared his origin story and how aviation has changed his life for the better:

"The goals that take the longest to achieve are by far the most rewarding. I truly hope you can

get started on your aviation journey; it just might change your life like it did mine" (SoCal

Flying Monkey, 2022, 8:12). He also recounted that learning to fly has challenged him in positive ways that have led to personal growth: "I've faced demanding situations in the air that have required planning, tough decision making,  intense multitasking, and even hand-eye coordination because things don't always go as planned. . . . These challenges have led to so much personal growth" (5:58). This pilot shared how learning to fly inspired him to buy an airplane, go on adventures, fly for worthy causes like Angel Flight, and start a YouTube channel to share his newfound passion with others. His story is one of obvious passion for aviation, encouragement, and inspiration for others to learn how to pilot an aircraft, as he believes it is a goal worth pursuing.

The pilots in the stories for this subtheme all shared a passion for general aviation that is evident in their storytelling, with many sharing what they referred to as the *transformative power of flight* (Airplane Academy, 2021c; SoCal Flying Monkey, 2022; The Fire Pilot, 2021). The stories in the next subtheme also share this concept but are also focused on how general aviation positively impacts the world.

**Subtheme 2: General Aviation Makes a Difference.** The stories featuring this theme, although fewer in number than other categories, showed a positive side of aviation that the researcher believed supported the concept that aviation changes lives and is worth pursuing. Various storytellers shared how flying had changed their personal and family lives for the better and how aviation could help others and make a difference in their lives. Pilot Eric shared how aviation has inspired him to help others: "It's been a true gift and it's inspired me to use aviation to help others. I've been lucky enough to fly volunteer missions transporting animals to safety for Pilots and Paws and fly medical patients for Angel Flight West" (SoCal Flying Monkey, 2022, 6:41). General aviation and volunteer pilots can make a difference in the lives of others by using

airplanes and their skills to transport medical patients. The story of a cancer patient's survival

due to Angel Flight pilots is shared as the viewer rides along with the patient and pilot on the

flight (Aviation101, 2020). The story shared that Angel Flight was an "amazing organization that

takes volunteer pilots with volunteer airplanes that volunteer their time and fuel to transport

patients from one city to another to get the treatment that they need" (Aviation101, 2020, 1:23).

Randall, the patient in this story, shared his gratitude for this:

> There's no way that we could be going back and forth to world-class medical care if it's
>
> not for folks who donate their time, their generosity, and their resources through Angel
>
> Flights…and I say this um part of why I'm alive is because of Angel Flights. (6:55)

Other pilots have also been inspired to use their airplanes to serve with Angel Flight. Tommy

from the channel Tommy Flies told the viewers about the enjoyment he gets from flying for

Angel Flight and also the opportunity to build flight hours while helping others: "It's been just an

amazing uh experience so far. I am in love with this organization, I'm in love with this

opportunity um it's making me just enjoy flying a lot more" (Tommy Flies, 2023, 6:52).

 The positive impact of general aviation was also found in ride-along experiences with

Missionary Bush Pilot, who flies humanitarian missions, delivers supplies, and transports

missionaries in Papua New Guinea's remote regions (Missionary Bush Pilot, 2021a, 2021b).

Another story shared how aviation made a difference in the life of a young snake bite victim in

Papua New Guinea (Taking Off, 2023i). Pilot Mark, the CEO of Samaritan Aviation, said about

the importance of the airplane in saving the young boy's life that "this boy, if he was to go the

traditional way, was at least a day away at this point day and a half away from the only hospital

so I loaded him in the plane" (Taking Off, 2023i, 1:26). Thankfully, flight time was only 30 min

to the hospital, and the boy survived. Mark expressed his gratitude for being able to use aviation

to serve people in remote villages and "make a difference using these airplanes" (5:18).

Additionally, stories were included in this subtheme that illustrated the bond between

pilots and the support they offer one another, even if they do not know each other. These

examples show how aviators make a difference within the aviation community. One pilot tells

the story of flying to another airport to get cheaper fuel for his airplane, only to find out that he

had left his credit card at home. (Airplane Academy, 2022). Without enough fuel to get home,

the pilot was in a bind and unsure what to do. Soon, some local pilots came along, heard his

story, and paid for his fuel. The pilot was overwhelmed by the generosity: "Here I am, these guys

that I've never met before are just being so kind to me and now I have a way to get home" (2:47).

He said, "It's a consistency among the pilot community [that] we try to support each

other…flying is incredible, but these other elements of the flying community are reason enough

to pursue it" (5:15). This support was also welcomed when Pilot Bruno found himself locked

inside his aircraft after landing at an unattended airport in the middle of the night (Fly With

Bruno, 2021). The pilot was able to use his radio to communicate with other aircraft, and

thankfully, two pilots in the area heard his transmission and landed to rescue him. Affirming the

supportive and positive relationship that pilots enjoy with one another, Bruno remarked,

> The aviation community is just amazing. These pilots went out of their way to come help
>
> me without knowing the airport, without knowing me, or even knowing the plane; the
>
> example of camaraderie and human respect that I had that day were just amazing. (9:28)

The positive side of general aviation shown above affirms that it makes a difference, changes

lives, and is worth pursuing. In the next theme, the story continues with more positive aspects of

general aviation.

*Primary Theme 5: General Aviation Can Be Fun and Provide Extraordinary Opportunities*

The stories with this emergent theme were some of the most personally enjoyable for the researcher to view and analyze. These hangar flying stories shared the passion, fun, and joy of flying airplanes for recreational purposes. The content illustrated how general aviation gives a pilot opportunities and experiences that others cannot access, allows for travel to places unreachable by ground transportation, and enables one to have unique adventures. This concept is seen in pilot Dan's story of flying his Cessna 210 in South Dakota to see some monumental sights (Taking Off, 2019). His story was "ATC gives me the monument pass…we get to fly and see Mount Rushmore from an angle that most people don't get to see…that's one of the great things about general aviation, you can do stuff like that" (2:11). Stories like that show the fun and exciting things one can do with an airplane.

**Subtheme 1: General Aviation Provides Fun Adventures and Unique Experiences.**

The hangar flying stories in this subtheme share some of the privileges that general aviation offers a pilot. Several stories and shared ride-along experiences focused on the fun and adventurous aspects of flying and highlighted some unique experiences that one can have in general aviation. Approximately 25 hangar flying stories were categorized with this subtheme, which included stories about flying a single-engine plane to various Caribbean Islands for vacations (Fly Me to the Fun, 2024), flying missions into remote jungle areas (Missionary Bush Pilot, 2020), as well as more entertaining stories about dodging cows on the runway (Taking Off, 2023c) and odd happenings at airshows (Taking Off, 2022c). One content creator and pilot told several stories in the sample about flying his single-engine Cessna 150 to private islands, to the Caribbean, and on other adventures (Fly Me to the Fun, 2023a, 2023b, 2024). His YouTube channel, Fly Me to the Fun (n.d.), is filled with aviation adventures in which he takes the viewer

along as a silent passenger as he shares the experience out loud. His introduction to one story

shows the adventure that general aviation makes possible: "We're about to fly our tiny plane to

one of the most incredible runways in the world, but to get there, we'll have to leave U.S.

airspace and cross 200 mi of open water to the Bahamas" (Fly Me to the Fun, 2024, 0:00). This

pilot's adventures are an example of what one can do with a pilot's license and an airplane, and

much of his content fits this description: "I'm going to attempt to fly my tiny plane with just two

seats all the way to this beautiful Caribbean island" (Fly Me to the Fun, 2023b, 0:00).

Ryan, the Missionary Bush Pilot (n.d.), also chronicles his adventures flying as a

missionary pilot for Ethnos360 Aviation. He shared, "I fly the Kodiak 100 here in Papua New

Guinea into some of the most epic mountain airstrips, jungle airstrips, single pilot IFR in the

mountains [and in] bad weather" (Missionary Bush Pilot, 2020, 0:10). His ride-along experiences

vary daily, showing the different kinds of adventures one can have flying. One day, he is flying

lawnmower parts to a remote village (Missionary Bush Pilot, 2021b), and another, he is

transporting large drums of fuel to a jungle airstrip just skirting the treetops as he lands

(Missionary Bush Pilot, 2024), but he is always describing the adventure:

> Marowaka's kind of tucked away in this little tiny valley in here, uh [we] fly right over
>
> top of it and then we'll enter into a left downwind, really really beautiful valley though.
>
> I'm showing you guys a waterfall down here that will go by in a second. It's pretty
>
> awesome. (Missionary Bush Pilot, 2021a, 10:22)

One could say that Ryan's adventures are popular as he has 327,000 subscribers to his YouTube

channel as of April 2024, and several of his videos have over one million views (Missionary

Bush Pilot, n.d.). These adventure stories and others in the sample show the positive side of

general aviation in terms of what one can see and experience with an airplane.

Other stories within this subtheme had some adventure elements but were categorized as unique experiences one can have in general aviation. Some of these hangar flying sessions contained elements of both entertainment and education, allowing for a bit of fun and learning at the same time. The stories shared ranged from the interesting to the unbelievable, including a ride-along flight in a $3.9 million airplane (Airplane Academy, 2023c) and an encounter with some reality television stars (Taking Off, 2023e). First, Pilot Charlie takes the viewer on a demonstration flight of a new Kodiak 900: "I got to fly the Kodiak 900 which is a 900 horsepower 200 plus knot cruise airplane that carries 10 people, it has a cargo pod and it can still take off and land in under 1500 ft" (Airplane Academy, 2023c, 0:00). He shared how impressive a machine it was and how much it costs, a cost which he admitted was beyond his and likely most general aviation pilot's budgets. This story was an example of sharing a fun flying experience while teaching the viewer about the airplane.

In another pilot story, while in Scotland, pilot storyteller Joe encountered two French reality television stars who needed a ride to Iceland (Taking Off, 2023e). These two individuals told him, "We are a reality TV show from France and we come out of basically out of the woods in France completely naked and the only thing we can use is things people give us" (2:26). After staying overnight in a Scottish castle, Joe flies these two men (with clothes on) to Iceland. This story was an example of never knowing what kind of adventure or experience one will have in aviation.

Lastly, another pilot shared another unique experience of unknowingly being involved in an airshow stunt in which one of the performers pretended to be drunk, steal an airplane, and fly it around the airport (Taking Off, 2022c). The performers were skilled pilots, but the pilot

storyteller in this hangar flying session was not told what was happening. Pilot Joey tells it like

this:

> They had a routine in which Marion would put on a double billed aggie hat and a pair of
>
> overalls with one side undone and would pretend to be drinking de-icing alcohol, getting
>
> drunk off of it, and wanting to go for an airplane ride (0:42).

Although this was unrehearsed, Joey was selected to give that airplane ride and told to fall out of

the airplane while the drunk person was taxiing it for takeoff. The result was a unique experience

for the pilot storyteller and the crowd at the airshow, teaching the viewer once again the

distinctive opportunities that general aviation can provide.

Several other stories were categorized into this subtheme, depicting storytellers sharing

their joy of aviation through hangar flying, which was entertaining but often provided vicarious

learning opportunities for the viewer. This concept is carried through into the next subtheme,

which shows another extraordinary opportunity that general aviation can provide for pilots:

aircraft ownership.

**Subtheme 2: Aircraft Ownership.** This subtheme emerged as these stories shared by

pilots were focused on the experience of owning an airplane and did not fit well into any other

theme or subtheme. These stories were categorized within the primary theme of fun and

extraordinary opportunities, as aircraft ownership was often connected to the stories of

adventure, fun, and unique experiences in general aviation. Aircraft ownership was often an

unspoken prerequisite to accessing the adventures and opportunities mentioned in the sample.

The pilots' stories in this subtheme often had an educational purpose to them, sharing how one

could afford an airplane (FloridaFlying, 2023b), why buying may be better than renting

(Airplane Academy, 2024), and even a few stories of the process of buying an airplane (Airplane Academy, 2021a; Heavy Metal Horizons, 2023; SoCal Flying Monkey, 2020).

In one interesting story, pilot storyteller Mark shared the story of his purchase of an aircraft that had been abandoned in a field for $8,000 (Pepke, 2023): "The story should actually defy all standards of how you should buy an airplane. If you look really closely you'll see… a virtual tree growing out from under the plane; it's a total mess, and I was very excited" (0:07). Mark took the viewer through his salvage experience and this extraordinary opportunity to save a diamond in the rough. In "How to Actually Afford an Airplane," another pilot urged the viewer to avoid buying a certified aircraft like a Cessna 172, instead saying, "To get into aviation and do it affordably, my number one piece of advice is to go with an experimental airplane" (FloridaFlying, 2023b, 2:35). Interestingly, he gave this advice in one story, but in another hangar flying session, the same pilot seems to contradict the advice by sharing the multiple items that need to be serviced or checked regularly with his experimental Vans RV12 airplane which as he notes can be very expensive (FloridaFlying, 2023a).

In a persuasive story, Pilot Frank encouraged the viewer to buy a specific type of aircraft: a Grumman (Grumman Pilots, 2021). He promoted Grumman aircraft by listing the multiple reasons why a person should buy one: "They're fun to fly, and they're easy and cheap to own for the most part" (0:40). In "Buying a 77-Year-Old Airplane," another pilot shared his challenging journey to purchasing an antique aircraft: "It was surprisingly difficult to buy a vintage airplane, like it was surprisingly um a lot of hoops to jump through" (Heavy Metal Horizons, 2023, 10:05). This pilot shared his passion for wanting this particular airplane and taught the viewer the reasons why an older airplane was a good choice.

Pilot Charlie shared some realities of aircraft ownership in a very informative hangar flying session about the privilege: "With very few restrictions you can go just about wherever you want and experience some really cool things" (Airplane Academy, 2021b, 0:25). He also shared that while owning an airplane is expensive, a benefit is that it can make one a better pilot. He recounted, "That's one really, really rewarding and fun part about owning your own airplane is that you can become really, really good at it in a way that it's just harder to do when you're renting different types of airplanes" (2:26). This idea that the extraordinary opportunity of aircraft ownership can make one a more proficient pilot connected to other story themes concerning the need for pilots to be safer by gaining knowledge and proficiency. Charlie might argue that if one wants to make general aviation safer, then one should own their own airplane.

Other pilots passionately shared how owning an airplane was a dream that, once achieved, was transformational for their lives. In another story with Charlie, he discussed his journey to buying a particular aircraft, a Cessna 182, saying, "Five years ago I bought a Cessna 182, and my life has never been the same" (Airplane Academy, 2021a, 0:00). He affirmed that aircraft ownership was an extraordinary and enjoyable privilege of general aviation:

> Flying really, really changed my life. I've been able to you know go explore the
>
> mountains of Idaho and see uh different parts of the country; . . . that's been just a
>
> tremendous sense of freedom and . . . just being deeply thankful that I get to live in a time
>
> and a place in human history… and even do this at all in my own airplane. (Airplane
>
> Academy, 2021a, 8:38)

Pilot Eric echoed these sentiments in his story about his purchase and restoration of a Piper Cherokee Six:

> This airplane has changed our lives. …we've had amazing adventures all around Southern

California, we've gone as far as Sedona, the Grand Canyon and Seattle. And seen some

great sights out of these windows like Catalina Island, Mount Shasta, Crater Lake, and

Mount St. Helens. (SoCal Flying Monkey, 2020, 5:28)

These stories are filled with a seeable passion and love for general aviation. The

storytellers share how these unique experiences and adventures are the reasons that they fly

airplanes. While these extraordinary opportunities are available for those with pilot certificates,

these individuals often encouraged the viewer to join them in general aviation so that they, too,

can experience the world in a brand new way.

The primary content themes illustrate the principal messages of the hangar flying stories

selected for this study. Connections between the themes were found especially between Primary

Themes 1, 2, and 3. The stories categorized in Theme 1 present the idea that general aviation can

be very dangerous, and Theme 2 focuses on how pilots must strive to become safer in the sky.

The primary way pilots become safer, as shown in Theme 3, is by continuing to build

knowledge, continuing to hone flying skills, learning from the mistakes of others through hangar

flying, and committing to avoid hazardous attitudes and be the most educated and safe pilots

possible. By doing so, as was shown in Themes Four and Five, they can better enjoy the life-

changing adventures and opportunities that aviation provides.

**RQ2: How do the viewers of the digital hangar flying content respond to it?**

The comments of each video story were analyzed to provide the researcher insight into

how this type of hangar flying content was generally perceived by general aviation pilots who

may consume this information. Patterson (2018) found that the comments left by YouTube

viewers may rival the depth of sharing found in in-person interviews and provide valuable

insights for the researcher. The researcher manually sifted through the comments, reading each

line by line and recording findings. This process continued throughout the research and was augmented by an online application. Utilizing Hadzy, a free online tool that enables the sorting and searching of YouTube video comments, the researcher was able to perform a more efficient analysis of the comments of each video (Hadzy, n.d.). Searching a video's comments by keywords or author was helpful, as were the other analytical tools provided by the tool. The researcher was able to see the authors of each comment and the time and date each was made.

The researcher looked for overall sentiment toward the story and storyteller as well as possible indications of how the story influenced the viewers. In answering the research question, the following sections will present findings on overall sentiment and common themes among the comments and provide examples from the viewer responses. Responses contained within are from real viewers using their YouTube usernames. Comments revealed vicarious learning as well as an overall positive sentiment and supportive environment for digital hangar flying.

*Overall Sentiment*

Over 35,000 comments were distributed among 110 video stories selected for this study. Some hangar flying stories garnered more comments than others, with the lowest belonging to a story about radio failure with only five comments (Taking Off, 2023k), to the story of the pilot's process of buying and restoring a Piper Cherokee Six aircraft with 5,800 responses as of April 2024 (SoCal Flying Monkey, 2020). The overall sentiment of the viewers was positive with very few video artifacts containing any significant number of negative comments. Regarding stories of accidents, near-death experiences, or other emergencies, the comments generally supported pilots. Viewers often agreed with the pilot's decisions and expressed gratitude for the story and often the shared lesson. Viewers also shared their respect and admiration for the pilot storytellers' honesty, transparency, and willingness to admit mistakes that they may have made. Several

commenters expressed their appreciation for an educational lesson that they learned about flying

that they believed would save lives and make them safer pilots. Generally, this type of comment

from a viewer was typical: "I love videos like this! Invaluable information from other pilots must

not be underappreciated, regardless of flight time. Thanks for sharing!" (readgodlygamers489,

2023). Stories of the adventurous or extraordinary side of aviation were also praised for the

inspirational story, the video content, and the beautiful scenery shared.

While most sentiments were positive, there were some negative responses. Regarding

stories involving accidents or emergencies, some viewers openly criticized pilot storytellers for

their decisions, ranging from humble disagreement to scolding. Those comments also contained

unsolicited advice. Viewer responses to one hangar flying story were nearly all focused on

scolding the pilot for his actions in the story and in the nonchalant way he referred to safety

issues during the storytelling (Taking Off, 2023d). This viewer's comment is an example:

> Hate to be that guy, but this is a horrible story. Very low-time pilot in a maintenance
>
> mindset, next to no flight planning, complex unfamiliar aircraft in poor condition, low
>
> fuel, mountains over clouds, night, unfamiliar area of flight and airports, get-there-itis
>
> and worst of all textbook invulnerability and impulsivity hazardous attitudes. There are a
>
> dozen or more things in this story that could have easily had a bad outcome, and it's
>
> presented as a humorous "look what I got away with" tale. Obviously glad it turned out
>
> ok, but this is the most dangerous storytelling I think I've ever seen on YouTube.
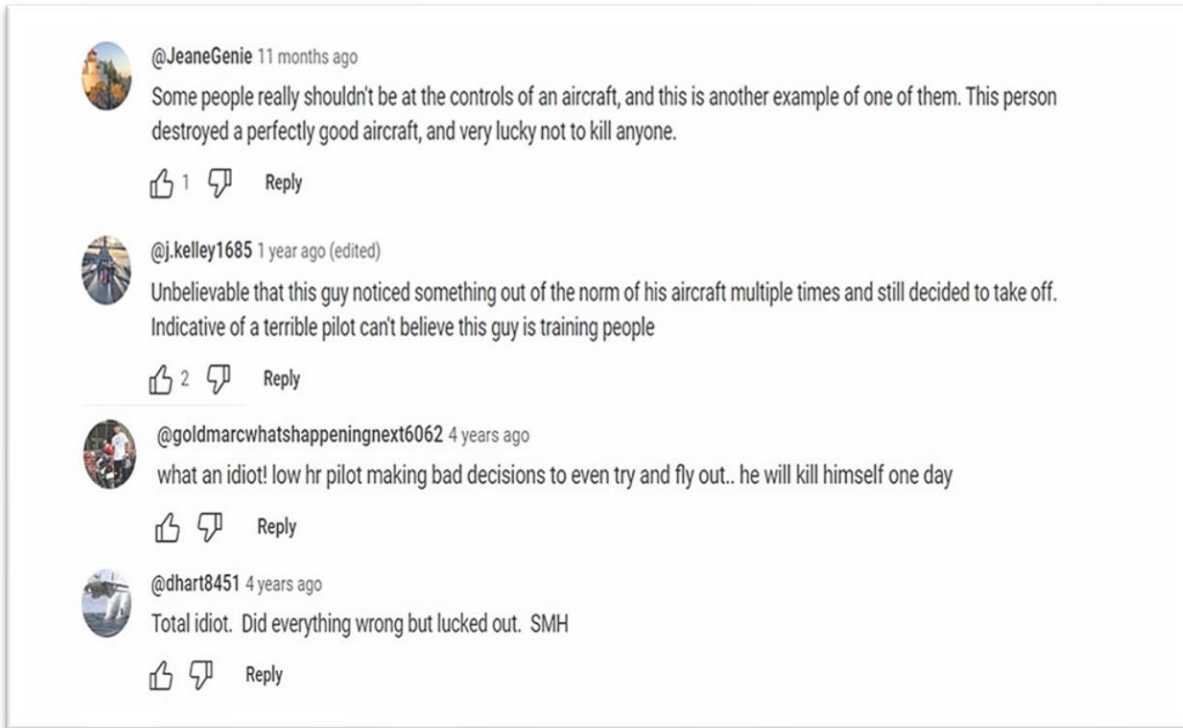>
> (CuratedPile, 2023)

While this particular story did have those who expressed gratitude for the story and support for

the pilot, this viewer pointed out that this kind of hangar flying could encourage others to imitate

the same reckless behavior. This finding aligns with Bandura's and Gerber's thoughts that

exposure to television violence could lead to viewers becoming violent people due to social learning and cultivation (Bandura, 1978; Romer et al., 2014).

Another interesting story that contained predominantly negative sentiment was the story of a pilot who found himself suddenly in instrument conditions, which caused him to lose sight of the ground (Taking Off, 2022g). The cause was smoke from a fire on the ground that obscured his view out of his windshield. To escape it, the pilot decided to execute a controlled descent into the obscuration. Most viewers disagreed with the pilot's decision, saying he had poor training and that he could have killed himself. Most suggested their corrective strategies while scolding the pilot. One viewer said, "Wait, wait, wait. ...Wait. I don't recall any time in my PPL training when I was told to do a 'wings level-controlled descent' for inadvertent IMC. Pretty sure it's a level 180 degree turn back the way you came" (keithhendrickson8522, 2022). Another commenter was blunter: "Doing what you did is how to die when flying in the mountains" (Heathfx5, 2022); and another questioned the pilot's instruction: "His instructor almost killed him!" (clintg1294, 2024). While there were a few commenters that supported this pilot storyteller, the majority offered only criticism.

A final example of negative comments was found in the story of a pilot who chose to abort a takeoff because of gusty wind conditions which nearly caused a loss of control (Aviation101, 2015). The pilot safely exited the runway and waited for weather conditions to improve. Despite this seemingly good decision, a few viewers stooped to derogatory name-calling, and others commented with negativity, such as "what an idiot! low hr [hour] pilot making bad decisions to even try and fly out. . . . He will kill himself one day" (goldmarcwhatshappeningnext6062, 2020). More examples of negative comments found in hangar flying stories are presented in Figure 6.

**Figure 6**

*Examples of Negative Comments*



@JeaneGenie 11 months ago
Some people really shouldn't be at the controls of an aircraft, and this is another example of one of them. This person destroyed a perfectly good aircraft, and very lucky not to kill anyone.

👍 1 👎   Reply

@j.kelley1685 1 year ago (edited)
Unbelievable that this guy noticed something out of the norm of his aircraft multiple times and still decided to take off. Indicative of a terrible pilot can't believe this guy is training people

👍 2 👎   Reply

@goldmarcwhatshappeningnext6062 4 years ago
what an idiot! low hr pilot making bad decisions to even try and fly out.. he will kill himself one day

👍 👎   Reply

@dhart8451 4 years ago
Total idiot.  Did everything wrong but lucked out.  SMH

👍 👎   Reply

Before moving on, it is worth noting that some viewers responded to these negative sentiments with rebukes and corrections, expressing their disapproval of derogatory and disrespectful comments and calling out the negative commenters. The pilot's story of executing the low altitude or impossible turn back to the runway after his engine failed on takeoff was met with many criticisms and negative comments (Air Safety Institute, 2016b). These criticisms were met with this viewer's opinion:

> I love how these videos always bring out the "expert" pilots, with the I would have done this and I would have done that, when in reality all they would have done in this nightmarish situation is shit their pants and then crash the plane! (terribleTed-ln6cm, 2020)

Another viewer watching "Real Pilot Story: From Miscue to Rescue" (Air Safety Institute, 2015)

agreed and commented,

> Welcome to the internet :D Everyone's an "expert" and has 1 bajillion hrs in whatever it
>
> is they claimed to be a pro in. Gotta remember that 99% of the people who'll shitpost
>
> don't have the slightest clue about what they're talking about. (NoLifeGamer1080, 2020)

Again, several other pilot viewers commented with supportive statements about these stories and

the storytellers.

Now that the general responses of the viewers have been presented, the study presents the

primary themes of the viewer's comments. Like the story content, the comments also produced

some recurring themes worthy of note. While fewer than the content themes, the comments were

connected and often shared the same theme as the hangar flying story. There are indications that

the viewers made learning connections; however, the findings for Research Question 3 will

present more specific examples of vicarious learning from the stories. Presented here will be the

primary themes of the comments and those recurring concepts or messages that seemed universal

or dominant throughout the viewer responses.

### *Primary Comment Theme 1: Learning from Others' Mistakes is Valuable*

With the stories that shared lessons learned from emergencies, accidents, or other

situations where mistakes were made, the primary theme of the viewer comments was focused

on the educational value of this hangar flying. Pilots were praised for their willingness to admit

mistakes and publicly display their imperfect flying skills for the world to see and critique.

Viewers commented on the great lessons gained from the stories and the power of the stories to

save lives and make safer pilots. The pilot who shared the mistakes he made when he flew into

the Oshkosh Airshow (Blue Sky Flight, 2023) received these comments:

Thnx for the teachable moment. Just goes to show that even with significant preparation,

we can still make mistakes. What's important is to learn from them and even better to

share the experience,  as you have done, so others can learn from it also. Kudos.

(blakecarlson4835, 2023)

Another pilot viewer commented that it was this kind of honesty that could lead to a safer

general aviation community:

It's not the errors that make us good or bad pilots, it's how we deal with them that counts.

The ability for us all to learn and adapt from others' events is what's important here, and

so I thank you for your candid review. This is the essence of an open safety culture that is

so needed in aviation - that way we all learn. (EtiRats, 2023)

Pilot Josh's series of poor decisions in his get-there-itis story (Taking Off, 2023a) gained

much positive support from viewers, who found great value in learning from his mistakes. A

comment read, "Love your candor, Josh. Thanks for helping us all learn from the mistakes of

others, and keeping it real" (unlisted773, 2023). Others pointed out that it was valuable to see

that even though Josh was a seasoned pilot, he still made mistakes, was at risk of hazardous

attitudes, and could fail. One viewer said, "It's the experiences like this from which we both

survive and learn from that makes us better pilots" (ibgarrett, 2023). Many other commenters

shared the value of learning from the mistakes and poor decisions of other pilots, all

acknowledging that "reflecting on the mistakes is a great learning process" (petermorgan2104,

2022) and "stories and safety shares like this will save lives" (gregsanders7610, 2021).

One of the aphorisms Markovich (2019) listed on *Aviation Humor* was: "Learn from the

mistakes of others. You won't live long enough to make all of them yourself" (para. 9).

Interestingly, a pilot commenter recalled this phrase when commenting on a story about a pilot

striking a powerline during landing in his twin-engine airplane (Fastback Flying, 2023). That

viewer was thankful for the lessons that the pilot passed on from his accident so that the viewer

would hopefully be spared from learning them firsthand. The comments for the hangar flying

stories in this theme aligned with this aphorism and Meyer's (2015) opinion that hangar flying

was an invaluable part of a pilot's informal education.

***Primary Comment Theme 2: Gratitude***

A common thread throughout many viewer comments was gratitude, appreciation, and

respect for the story and storyteller. Every story collected for this sample included individuals

who thanked the pilot storyteller for sharing their experience. Some were thankful for specific

lessons learned or reminders given regarding some procedure, emergency situation, or other

piloting act. An example of such a comment is from "Real Pilot Story: Cold Weather

Catastrophe" (Air Safety Institute, 2023c). The commenter said, "Thank you for sharing your

story, John. It will save future lives" (UpraiseUp, 2023). In the case of emergencies, many were

thankful the pilot survived to tell the tale and praised the pilot for their skill in managing the

emergency. Pilot Chelsea's choice to land rather than fly in dangerous density altitudes was

praised: "Thanks for sharing! You might have labelled it a 'fail,' but not succumbing to the old

'get-there-itis' is a massive win, and says alot about your abilities" (mackerel1875, 2023). Other

viewers admired the pilot's honesty and transparency in telling a difficult story that revealed all

their mistakes for the world on the Internet. In the emergency story "Real Pilot Story: From

Miscue to Rescue," the pilot admitted to making many mistakes that nearly cost him his life and

the lives of his passengers (Air Safety Institute, 2015). However, most commenters were

supportive and thankful for his willingness to share the story to help them be safer pilots. One

viewer said, "On behalf of myself and the thousands of pilots whose loved ones are safer because

of this video, thank you Brian for sharing this. It is really brave of you and you have my admiration and respect" (davidmontgomery638, 2018).

Other hangar flying stories expressing gratitude focused on adventure, fun, and the utility of an airplane. Viewers appreciated the scenery shown in ride-along videos from Missionary Bush Pilot (n.d.) and stories shared by pilots who use their airplanes to travel to tropical islands. One comment concerning a story from Missionary Bush Pilot (2021a) said, "A video that had everything! Flying, preparations, ground and drone footage, and, of course, the wonderful scenery. Thank you for that" (FlashbackBassman, 2021). Another shared gratitude for the pilot sharing his travels to the Dominican Republic: "Thank you so much for sharing your adventure, and oh, what an adventure!!" (johnnukecop, 2023).

Finally, viewers seem to appreciate these stories as they serve as educational tools for flying, indicating vicarious learning. Some examples are "As a new pilot, these videos are gold. Thanks for sharing" (viviennepatterson5950, 2022) and "Great post—these are the stories that greatly help other pilots. Thanks for sharing your experience" (kurtadams7398, 2022). More findings related to vicarious learning are presented in later sections.

### *Primary Comment Theme 3: Safety Must Be Every Pilot's Number One Priority*

Hangar flying stories in the sample that dealt with emergencies, accidents, or safe and unsafe practices garnered comments focused on the need for all pilots to adhere to a safety mindset when operating aircraft, not only for themselves but for the good of everyone else. Good aeronautical decision-making, preparation, flight planning, and avoiding hazardous attitudes were all actions that commenters suggested would make pilots safer. For example, pilot viewers made comments on how good decisions can save lives, to never be afraid to ask for help (Air Safety Institute, 2011a), and the best way to maintain safety in an emergency is to "aviate …

navigate … communicate" (ryanmatthew511, 2018). Many applauded the pilot storytellers for doing these things well, and others commented that these things could have been improved in the particular situation. Common among comments for a pilot's quick decision to abort a takeoff due to gusty winds were statements like, "This is such a valuable, important video showing a pilot making such a professional decision that probably saved their lives. A real role model to me, honestly" (aviator_thomas, 2019). While this comment was positive, another viewer commenting on a pilot's near-accident due to fuel exhaustion and inexperience said, "That's why we have VFR fuel requirements. ... Enough to get to the destination, then an extra 30 minutes during the day, or 45 minutes at night. Even a 20-hour student pilot should know this!" (erich930, 2023).

After watching "Pilot Short Story - Into the Dark" (Air Safety Institute, 2023a) regarding the pilot who, while flying at night, lost all visual references to the ground, one viewer commented that there was a "simple solution to this. Ban night VFR in the US" (davidkavanagh189, 2023). The viewer seemed to believe that banning non-instrument-rated pilots from flying at night would increase the safety of everyone in general aviation. Several comments on this particular story suggested that earning an instrument rating would make all pilots safer, especially when flying at night. Regardless of the suggestion, the focus was on the importance of creating safer pilots, which was a concern of many in the comments, with one declaring, "I think all pilots should be thrown into this scenario as part of their basic flight training" (grayrabbit2211, 2023).

Although many commenters gave specific suggestions of how or why safety is essential for all pilots, the central focus was the same. One commenter, after viewing pilot Josh's story about his choice to abort his takeoff due to dangerous winds and weather (Aviation101, 2015), summed up this theme: "Safety is without a doubt our number 1 priority" (XaircraftX, 2015).

### *Primary Comment Theme 4: A Shared Love of Aviation*

Commenters often shared their passion and enthusiasm for flying as they responded to the hangar flying story. These types of comments were found in nearly every artifact, whether the story was inspirational, educational, or entertaining. A shared fellowship with other commenters and the storyteller was revealed in stories about emergencies, fun adventure stories, and tales of aircraft ownership. Support for pilot storytellers was common, along with praise for their courage in sharing a mistake or praise for their storytelling abilities. Commenters often shared encouragement or praise for the pilot storyteller, such as, "Your love and passion for flight is a beautiful gift!!" (shannondutchik7559, 2023), and "Excellent work! Great editing. Great content. You are now my number one aviation channel. Also, you might have just convinced me to ditch the 182 plans and opt for the Cherokee 6" (adamwpatterson, 2021).

The comments were uplifting, enthusiastic and often showed evidence of kindness, camaraderie, inspiration, and motivation. Commenters spoke of how aviation changed their lives, their love for the aviation community and airplanes, and the reward of fulfilling their flying aspirations. Some examples from viewers are: "When in doubt, just go for it; the love of flying that will get you there and life will never be the same" (creloxs, 2023), and:
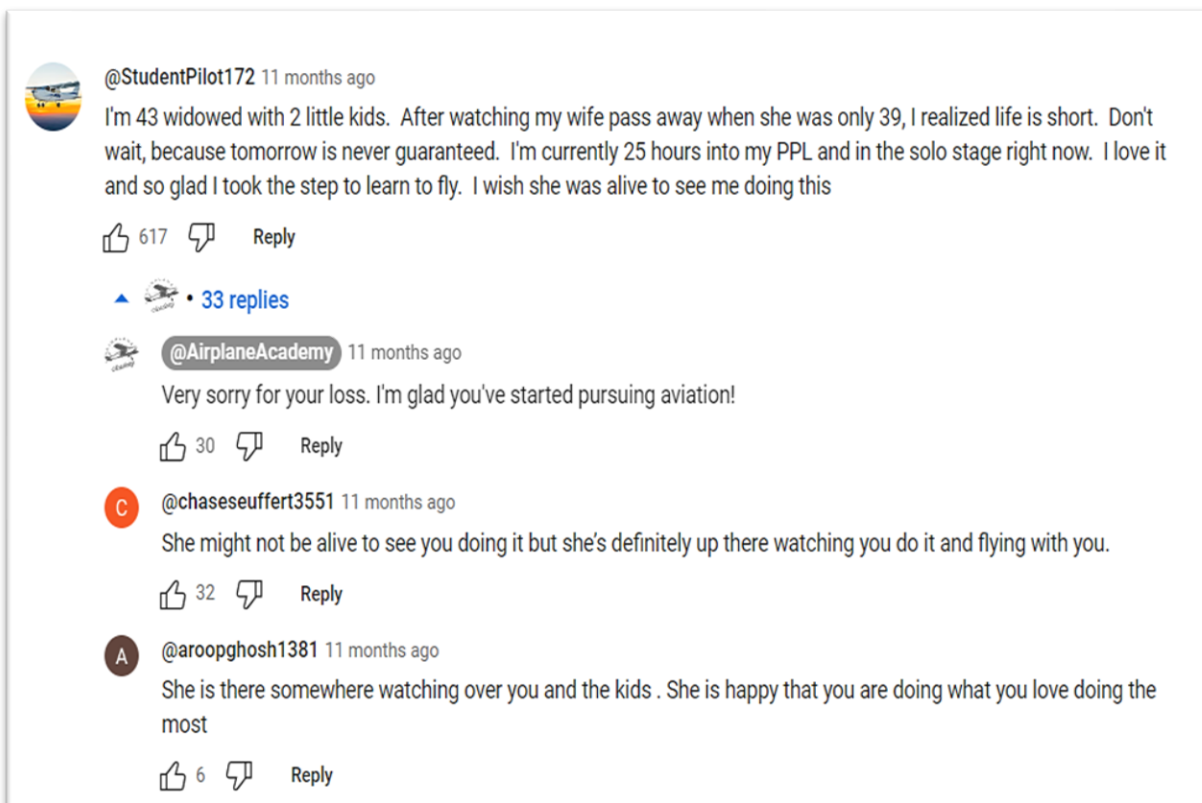
> Over 50 and taking lessons felt strange, but everyone I've met in my aviation journey has been supportive, and the love of aviation can be a unifying feeling. Don't wait, if you have the desire to fly, take the leap" (russperkins4054, 2023).

This love of the aviation community was seen in several comments, such as, "This is why I love the aviation community: no matter what, everyone is friendly and always willing to help" (kaiden9226, 2021) and "Love general aviation! Instant friends wherever you go" (curtinfam, 2022).

Commenters often replied to one another in solidarity illustrating a bond between individuals who have never met but are drawn together by their love of aviation. A commenter said, "We all love to fly, and we want to share it when we can" (tjwilliams7246, 2023). This sentiment is seen in the support offered through the replies of others. Regarding the hangar flying story, "No One Warned Me About This Struggle in Flight Training" (Airplane Academy, 2023a), one individual commented that he was learning to fly after the recent passing of his wife, gaining several replies of support and encouragement (StudentPilot172, 2023). Others also commented about their flight training struggles and gained replies of support motivating them to press on toward their prize: "Don't give up, keep at it, and keep working hard. Later down the road, you are going to look back and laugh and be glad that you kept going" (SaltyAviator1, 2023).

**Figure 7**

*Comments and Replies: Pilots Supporting Each Other*

The love of aviation ran throughout most of the comments, with many sharing stories of their own passion for flying, their struggles, and their victories. Although some commenters detracted from this view, they were few, with most exalting general aviation as life-changing and positive. A last comment that sums up many viewers' sentiment concerning flying and the pilot storytellers who shared their stories was, "Thank you for your willingness to show others such an incredible thing like aviation" (dawsonmartin6058, 2022).

### Other Findings Related to Viewer Comments

Some other interesting ideas emerged while analyzing the comments left by viewers of the hangar flying digital content. These were not necessarily themes but were ever present within the responses of those who engaged in the hangar flying stories. Specifically, the phenomena of reciprocation and parasocial relationships were found in many of the comments and are worthy of some exploration and explanation here.

**Reciprocation.** The Merriam-Webster Dictionary (n.d.-b) defines reciprocation as a "mutual exchange" or a "return in kind or of like value," a process that could apply to different kinds of situations. In the comments of the hangar flying stories, reciprocation took the form of commenters sharing their own stories in response to the video. Reciprocation was found in nearly every artifact selected for this study, from stories about emergencies and accidents to those about adventure, aircraft ownership, and learning to fly. Pilots shared stories about adventures they had taken, similar airplanes they had owned, the struggles of learning to fly, and their shared experiences of their mistakes and poor decisions. Additionally, pilot commenters often reciprocated with their own experiences that contained additional lessons beyond the original story. This finding supports Myers' (2022) research with storytelling and vicarious learning among air medical crews. Myers found that the storytelling process often began with a

triggering event, which was followed by the telling of a story, and resulted in a transformation where both listener and teller shared a greater meaning and understanding of the story's message. The cycle then began again as the listener became the teller, reciprocating with a new story.

These stories seemed to have a bonding effect amongst those who commented on each artifact, and while there were negative comments, most were positive and friendly in tone. The commenters often shared similar stories from their own experiences in support and commiseration, or as an alternative viewpoint. Many of them begin like this one from a commenter on a story from Airplane Academy (2022): "Reminds me of several years ago, out flying with my friend Dan in his Cherokee 180. Stopped at an airport for fuel, used the restroom. Came out, started up, and the plane wouldn't move . . . flat tire" (ScottWoodland, 2022). Other pilots shared a story followed by their advice or lesson. Responding to the story of the pilots who struck powerlines while flying low over a waterway (Air Safety Institute, 2013), a viewer reciprocated,

> A couple years ago, an airline Captain friend of mine who had just finished his home-built plane hit wires in a swampy wooded area. It caught him and put him into the ground instantly killing him. Please study the maps before getting low or stay legal and keep at least 500AGL. (SGTSnakeUSMC, 2020)

Some pilot viewers shared their own stories, followed by criticism of the pilot's decisions or actions, which usually went unanswered by the original storyteller. While these comments did not lead to productive conversations, other pilot viewers shared a story and then a positive takeaway or lesson that was reinforced from both stories, as was the case concerning the pilot story of an in-flight fire (Air Safety Institute, 2011b): "I had an engine fire after startup on a Piper Warrior some years back. After trying to purge the motor, I found out that the aircraft

didn't have an extinguisher on-board. Absolutely has to be part of your preflight!"

(pedrocaria6852, 2016). Another pilot commented on a story about a mistake made during a soft-

field takeoff (Taking Off, 2023h):

> Many years ago, I remember landing on a grass strip. When I went to take off with
>
> passengers, I was very slow to accelerate, and the aircraft almost didn't become airborne
>
> till the end of a 4,000-foot runway. I barely made it across the tops of a cornfield, and I
>
> was so scared at the situation. After I landed, the owner of the farm was laughing as I was
>
> coming in for landing. When I parked the airplane, I went over and yelled at him that I
>
> didn't think it was so funny that I almost wiped out with three people on board. He said,
>
> 'Well, that's what happens when you take off in the grass. Where do you think the
>
> runway is.' Where it was was 40 yards to the left and was 5,000 feet of very short mowed
>
> grass. I attempted to take off in what was 3 inches of weeds. The next time I attempted to
>
> take off on the correct runway, I was able to lift off the ground effect in about 1500 feet.
>
> Moral of the story. Be sure you know where your runway is when you're dealing with
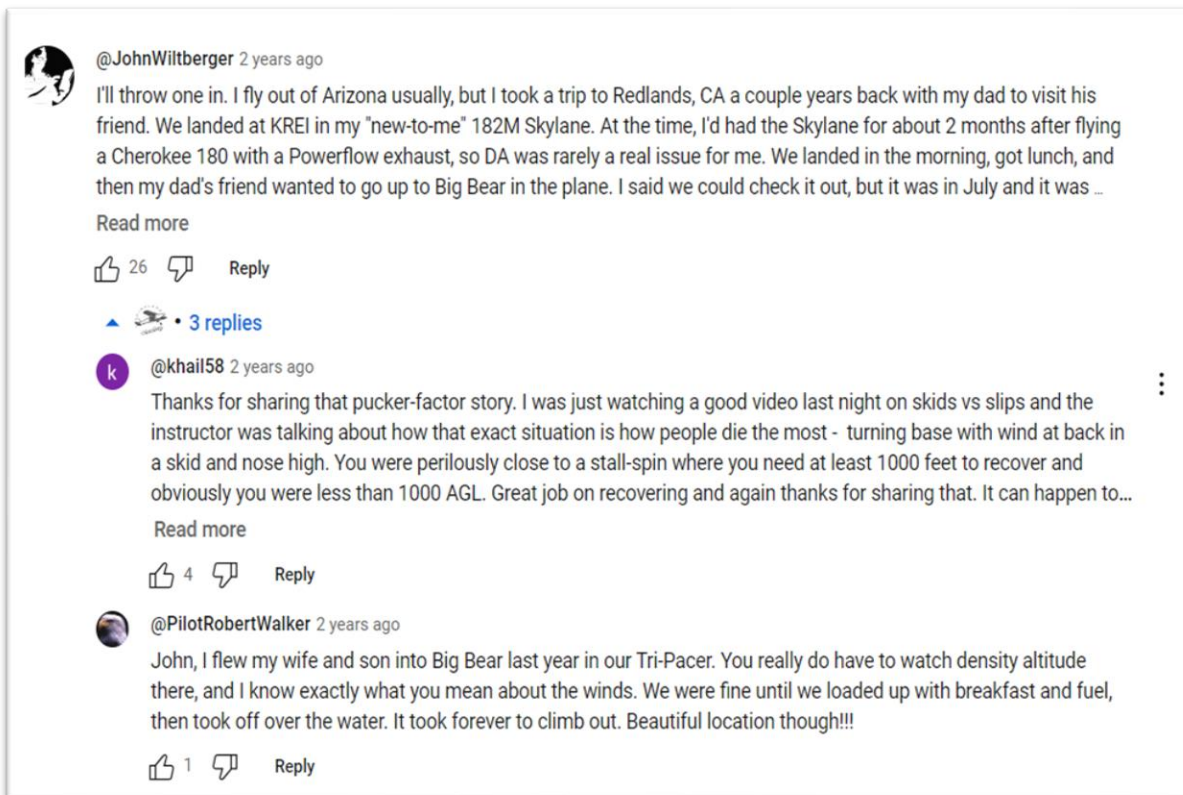>
> grass. (aviatortrucker6285, 2023)

Interestingly, in some of the hangar flying stories in the sample, other pilot viewers

would join in the conversation by replying to another commenter with their own story, lessons

learned, and mistakes made. This compounding educational content would continue as other

viewers replied to each other. An example is from Pilot Charlie's story of the mistakes that he

has made in his flying journey (Airplane Academy, 2021e). Pilot viewers of this video were

encouraged to leave their stories of mishaps and mistakes made in flying in the comment section

so that others could sympathize with, support, or learn from them. The pilot storyteller's purpose

in doing this was to show that by reading others' stories of mistakes or challenges, pilots would

be encouraged to forgive themselves for their mistakes and encourage others by passing on lessons learned. The result was 82 comments and many replies to comments, illustrating reciprocation and a picture of what digital hangar flying is.

These and many others like them were genuine hangar flying exchanges in which one pilot tells a story, which spurs another pilot to share a similar experience, and the cycle goes on indefinitely. If more pilots join, the plot could become more complex, and the stories could diverge widely from the original story's purpose. Ultimately, this phenomenon of reciprocal storytelling is at the heart of this study, which is that pilots can vicariously learn from one another through the stories they tell and experiences they share, and this mutual exchange of learning can help them to improve their skills and avoid future mistakes.

**Figure 8**

*Reciprocation Within the Comments–Example A*

**Perceived Parasocial Relationships.** An unexpected phenomenon emerged as the sample was analyzed for common themes in the content of the digital hangar flying story and the comments left by viewers. In many of the comments below the videos, there were indications of familiarity with the storyteller, almost as if there was an existing relationship between the viewer and the pilot storyteller. Some comments indicated a perceived history between the two individuals, even though it was unclear if they had ever met in person. In some comments, viewers asked personal questions about romantic relationships, other videos that the storyteller had made, or some other comment that alluded to some kind of past encounter or relationship. These moments are known as *parasocial interactions* and refer to when a media user perceives a media performer as an "intimate conversational partner" (Dibble et al., 2016, p. 21).

Initially developed by Horton and Wohl (1956), parasocial interaction, which can be a one-time viewing of a YouTube episode, can lead to a deeper perception of intimacy known as a *parasocial relationship* that often lasts beyond one view of a video. Although Horton and Wohl's view of media was limited to television, film, and radio in 1956, they posited that viewers perceive a give-and-take conversational relationship with the media performer, who is the pilot storyteller in the YouTube video. This person is seen as a celebrity of sorts with which the viewer feels connected. Because the storyteller performer shares personal experiences, there is a perceived intimacy and familiarity between the viewer and the storyteller. For example, even though viewers may not have met Ryan from Missionary Bush Pilot (n.d.), they may feel like they have a personal connection or perceived friendship with him after watching multiple videos of his flying adventures. The exact answers to how and why this relationship may happen are beyond the scope of this research.

In the sample for this study, indications of these relationships emerged in several hangar flying stories. Some viewers appeared in the comment sections of several videos created by one user, indicating that they follow this content creator and are most likely subscribed to their YouTube channel. Some comments were simple good wishes or encouragement but seemed like something you would say to a friend. Comments like "hope you and your dad had a great time at Oshkosh!" (edwardstephens247, 2023), and "so nice to see you back in the saddle, Ryan. This is something you were born to do, and it really shows. My wife and I pray for your safe travels every day" (EdwardSeeto, 2024) are examples of these friendly well-wishes.

Some of the pilot storytellers in the sample have been creating content for many years, and it was evident in some commenters' posts that they had also been following them for a long time, which seemed to deepen these parasocial relationships. Pilot storyteller steveo1kinevo told his viewers about losing his corporate flying job, which gained many comments due to the creator's large following (steveo1kinevo, 2023). One commenter spoke of how this story so emotionally moved them that they shared it with others, almost as if they were all part of a family:

> Hey Steve! Been following your videos for years ... student pilot/aviation enthusiast myself. I actually sat down with my mom and watched this video with her and kind of explained to her your career and what you've been doing for so long. Even her first time watching your video with me, she felt emotional for you as did I. We can both tell you're upset to be losing "your" airplane. So a great ride you had. Change is a part of life though brotha. ... you've got so many more wonderful hours ahead of you in the sky, things happen for a reason. ... You'll be where you're supposed to be. Looking forward to seeing

what's next for you, Steve. You've got all of us to vouch for you, you know that! Love ya,

buddy. (lucaslloyd6640, 2023)

Many other commenters on this story and others posted similar sentiments.

Other pilot viewers also showed familiarity or intimacy with storytellers. While

investigating the level of relationship these viewers had with the storyteller was beyond the

scope of this study, one can infer that most have never even met the storyteller, yet some

comments were those that close friends would share who have some history together. Some

examples of these comments were "It is nice to see your happy eyes" (arvindchandra3283,

2023); "How cute are you. :-)... Enjoyed your story" (ghostflight73, 2023);  "Nice to see you

guys back. Was thinking of you two, when the hurricanes hit Florida. Looks like crossing my

fingers have helped" (MrShortcut70, 2022); and "she is a certified aircraft mechanic, flys and

owns her own plane. And adorable. You marry a woman like this. Come on Josh ... what are you

waiting for?" (2ndborn186, 2023).

This familiarity extended to references to other stories and videos shared by the

storyteller and indicated that the viewer was following the experiences and lives of these pilots.

In "Putting Gear Up Too Soon??" (Baron Pilot, 2022), a viewer commented on a separate story

and specifically addressed the pilot's wife, who is also in the video: "Kim, this was a perfect

opportunity for you to mention that you've had an engine failure experience on takeoff & explain

what the 'startle effect' was actually like" (peterwaugh9416, 2022). The viewer was referring to

other content on YouTube concerning Kim's flight training journey (Baron Pilot, 2024).

However, viewers commented about that process, which was not the story's focus. A commenter

also asked, "By the way. When will Kim start (if it's in her mind) IFR/multi-training?"

(thunderbolt513, 2022). The commenters were clearly interested and invested in other events in the storyteller's life beyond the subject of the hangar flying session they were viewing.

Finally, in a story that Trent Palmer told of his engine-out emergency (Taking Off, 2023j), a commenter asked a question referring to an experience Trent had shared on another YouTube channel (Trent Palmer, n.d.). The commenter asked, "Get your license back yet?" (DavidSmith-jj5pr, 2023), referencing Trent's video sharing his private pilot certificate being suspended by the FAA (Trent Palmer, 2022). This viewer was obviously familiar with Trent's experience and life, at least through his engagement with his videos.

The findings also suggested that some viewers choose to learn from a particular creator because they trust the person and that individual's content, even though they only share a virtual relationship. Some viewers indicated they had consumed content from specific creators for years, a timeframe which seemed to solidify this perceived trust. It is possible that parasocial relationships characterized by this perceived trust may act as an accelerant to the vicarious learning process, causing viewers to desire to continue engaging in the hangar flying content the creator provides. For example, the viewer watches, likes, learns from, and trusts steveo1kinevo's (n.d.) content, and the greater the liking, trust, and learning, the more content the viewer may want to consume. Over time, the viewer may learn more and more about the creator, deepening the liking and trust, and thus, the perceived parasocial relationship. Simply put, their desire to learn from a particular storyteller may increase as their parasocial relationship with the individual grows.

Most scholars agree that these parasocial relationships are mostly an illusion created by the viewer to gain a connection (Dibble et al., 2016). However, for viewers, these relationships may be perceived as real, just as some perceive a connection to a television or film celebrity

(Rosaen & Dibble, 2017). Rosaen and Dibble found that viewers connect with those on-screen who are perceived as similar to themselves or someone they know in real life. Viewers watch the storytelling videos and make comments in attempts to connect with the storyteller, although that connection may never occur. While the pilot storyteller could respond to a comment, according to this study, many do not. While they may be an illusion, evidence of these parasocial relationships existed in many hangar flying stories in this study's sample. However, the exact effect these relationships have on vicarious learning was beyond the scope of this research. More investigation is needed to determine how vicarious engagement with online personalities via digital storytelling creates parasocial relationships and how these may affect a viewer's choice to learn from and consume the content.

**RQ3: What inferences can be made concerning a connection between vicarious learning and hangar flying?**

This question looked for any indication of vicarious learning from the hangar flying story within the comments section of each YouTube video in the sample. The researcher looked for any learning connections the viewers made in response to the story's topic or any noted behavioral changes the viewers said they would make after hearing the story. The researcher posited that if this kind of content could foster vicarious learning among viewers, then one could infer that this kind of digital hangar flying could also foster learning across the general aviation community and influence pilots' personal flying cultures. Thankfully, the sample did not disappoint, as many examples of vicarious learning were indicated in the viewer comments. Some hangar flying stories resonated with viewers more than others, resulting in more examples of social and vicarious learning.

Social learning and social cognitive theories posit that individuals learn behaviors through observation and then choose to imitate or reproduce that behavior based on perceived rewards, punishments, past experiences, and other psychological factors (Bandura, 1977, 1986). As noted in previous sections, pilot viewers' responses showed that they found learning from others' mistakes in the stories to be a valuable experience and indicated that they would somehow apply this new knowledge to their future behaviors. Some pilot viewers indicated that they would implement new actions based on the story, were thankful for the reminders, or, in some cases, learned what actions to avoid. In all these cases, knowledge was gained not through direct experience but through vicariously learning from pilot storytellers who shared their stories with the audience. Following primary themes found in the content of the digital hangar flying artifacts, the following presents examples of vicarious learning connections revealed in the viewer comments.

### *Indications of Vicarious Learning: Safety Must Be a Pilot's Number-One Priority*

Many indicated that watching videos and listening to these hangar flying stories were valuable educational tools that had the potential to improve the safety and skills of general aviation pilots. Many commenters directly shared the lessons they learned about safety issues, risk mitigation, and behavioral changes they will make due to viewing the story, and others gave more indirect statements. In the story "From Miscue to Rescue" (Air Safety Institute, 2015), a pilot chose not to use flight following during his route, encountered deteriorating weather, crashed in the mountains, and waited nearly 30 hr for rescuers. A pilot viewer said, "Many lessons can be learnt from this tale but overwhelmingly ALWAYS file a flight plan" (pasoundman, 2020). The implication was that if the pilot had filed a flight plan or used flight following, the rescuers would have been able to find them much sooner. Other viewers of this

story mentioned learning the importance of having an alternate plan when weather interrupts the

flight, having emergency equipment in the airplane, and not falling victim to hazardous attitudes.

A viewer said, "There are a lot of lessons here. File a flight plan, bring emergency gear and

clothing, as a pilot, don't be pressured by others to continue on if the weather or situation doesn't

warrant it" (UTClassof, 2021).

Another example of vicarious learning was indicated in a story of a pilot who attempted

to land his plane in gusty wind and high-density altitude conditions, aborted, and performed a

go-around without raising his flaps (Fly With The Guys, 2023). The pilot admitted that he had

not practiced go-arounds enough and had suffered from the hazardous attitude of complacency.

Pilot viewers shared their takeaways: "This could happen to any of us. But go-arounds need to be

practiced often, which reminds me that I haven't done one in a while" (yannismakridis, 2023);

and "We all should practice go around scenarios! Just because you have your license doesn't

mean that irregular scenarios shouldn't be practiced!" (V1Speed360, 2023); and "Go-arounds

don't get practiced enough, and it's the failure to clean up that gets everybody. I've forgotten too"

(aviatortrevor, 2023). These pilot viewers learned the importance of practice and avoiding

complacency.

Commenters also learned vicariously through the stories of accidents, such as the pilot

who survived a dangerous bird strike (Taking Off, 2023b). He stated in the story that even

though blinded, he was so familiar with these aircraft systems that he knew where the controls

and buttons were by feeling alone, which helped him remain calm and in control. Viewers

indicated the value of this knowledge in changing the way they fly. They said, "Wow! Hate that

it happened to you, but by sharing your story, you have given me the motivation to train and

know my airplane better! Thanks" (hillcrestannie, 2023). Another added, "Good things that came

from it [the story] is I know now that in the face of an emergency I will continue to fly the plane"

(mikeryan6277, 2023).

As indicated in the comments, two other hangar flying stories from the Air Safety

Institute's (n.d.-b) *Real Pilot Stories* series seemed to enable vicarious learning. In the story

"Hidden Hazard" (Air Safety Institute, 2023b), the pilot recounted his tale of succumbing to

carbon monoxide poisoning while in flight, causing unconsciousness and resulting in a crash.

The pilot's story revealed the dangers of this odorless and invisible gas, which can alter the mind

and ultimately kill. Pilot viewers commented on the knowledge they gained from this shared

story and the way they might apply it to their flying: "I'd plaster my cockpit with CO detectors

after this experience lol" (jmizzonini, 2023); "I've got a battery-powered CO detector in my

plane. …now after watching this I'm going to add a stick on CO detector as a backup; scary

stuff, but this pilot had so many warning signs and no CO detector" (kings101ish, 2023); and "I

found the real world description of symptoms very useful. It's a good reminder that they aren't

always textbook and may come and go" (danko6582, 2023). These pilot viewers indicated

knowledge gained or renewed that, when applied, may save their lives in the future.

The next story from the Air Safety Institute to note here is "Real Pilot Story: Fire in the

Cockpit" (2011b), which has been viewed nearly 200,000 times. It is a story of a pilot and

passenger's survival when their single-engine airplane caught on fire during flight. The aircraft

was not equipped with a fire extinguisher, leaving the occupants unable to fight the fire. Both

individuals suffered significant burns and smoke inhalation but were able to land the airplane

safely in a field. This story and the description from the pilot of how fast a fire can spread in a

small cockpit seemed to resonate loudly with the viewers. Several indications of vicarious

learning, changes in future behaviors, and applications of knowledge were found: "Thank you

for telling your story. Just added fire extinguisher to pre-flight checklist" (professorhardknock, 2014); "After watching this, a working fire extinguisher is def on my go/no-go list" (tytusabrahamson6575, 2014); "Thanks for sharing this story. I'm a renter pilot and I'm going to make sure that checking for a fire extinguisher is part of my preflight from now on" (jasontatum7152, 2014); "Wow. I'll never fly again without an extinguisher on board" (ProChoiceJesus, 2015). These pilots were reminded of the importance of this kind of safety equipment and made these learning connections upon sharing in the hangar flying session.

Many other examples and indications of vicarious learning related to safety were found throughout the sample. The "Real Pilot Story: Lost Elevator" (Air Safety Institute, 2022a) yielded this insight from a viewer: "I learned so much, and you reminded me to develop the part of myself that is a proactive, prepared all the things that make me a better pilot and a better person. Thank you!" (scrappiemaddie518, 2022). In "Cessna Skymaster Wants to Roll!" (Taking Off, 2022h), in which pre-flight checklists were ignored, a commenter learned this: "Another great reminder as to how important checklists are. …yes. I will be coming out with a fresh annual next flight. Will be checking everything like Santa ... twice!" (KevinSmithAviation, 2022). A final example of vicarious learning regarding safety comes from the "Real Pilot Story: The Impossible Turn" (Air Safety Institute, 2016b), in which an engine failure caused the pilot to attempt a low-altitude return to the airport. The pilot advised others not to imitate his behavior but to become familiar with emergency landing areas near the airport. A pilot viewer made a comment that captured the essence of vicarious learning:

I've just realized something from this video! I don't think I've ever thought about looking

for possible landing spots at my home airport if something like this occurs during takeoff

and I'm not at pattern altitude. Definitely gonna review that now! Thanks! (memp6000, 2021).

### *Indications of Vicarious Learning: Pilots Should Always Be Learning*

Commenters indicated the importance of continued education through various means, including practicing flying procedures and engaging in digital hangar flying. Pilot viewers often seemed inspired to learn new things or gain more ratings and experiences. This finding is supported by a viewer who made this learning connection after viewing "Real Pilot Story: Cold Weather Catastrophe" (Air Safety Institute, 2023c): "This story is a great reminder to keep learning! Never assume you have reached Mastery. There is always ways to tighten up your procedures, training or equipment" (lyingcat9022, 2023). Interestingly, several pointed out the value of the digital content they viewed as powerful educational tools. In one example, a viewer pointed out how learning from video stories can help them avoid the dangerous complacency discussed in the video (Fly With Noel Phillips, 2023). The viewer said,

> I'll keep watching these videos and learning as much as I can, but especially learning about what can go wrong sometimes, and try to keep those scenarios in the back of my mind with hopes that I never get into those situations and, if I do, perhaps I may have learned something that might help me get out of it. (jasonjohnston94, 2023)

Sharing this sentiment, a pilot viewer noted what they learned from digital hangar flying: "These videos really push home not being overconfident and complacent" (garywilliams9678, 2022).

Finally, one example illustrated the importance of engaging in digital hangar flying and consuming this type of content to make them safer pilots. In the story of a pilot who nearly suffered a fatal stall-and-spin accident and credited his survival to watching videos of similar accidents (Texas Outdoor Ventures, 2022), one viewer made this connection, "Excellent video.

It's great to see such a clear real-world example of why it is important to study from accidents"
(cheapskateaviation, 2022). The pilot's story of overloading an airplane that caused a subsequent
crash on takeoff (Air Safety Institute, 2022b) was valuable to a viewer who mentioned that their
engagement in digital content such as this story was life-saving. The individual said, "Were it not
for my habit of listening to hours of accident reports and educational content here on YouTube, I
might have ended up like these guys" (JETZcorp, 2022).

Other videos illustrated comments indicating vicarious learning related to learning new
things, challenging oneself, and earning more advanced ratings. A shared ride along with Pilot
Kay gave viewers a glimpse into maintaining an instrument rating (FlywithKay, 2023b), to
which a pilot commented, "Good to see what comes with staying current. I am 9 hours in with
my CFI for my PPL now. Did my first instrument a few lessons ago, and wow what a nausea
fest!" (stuartmattingly9681, 2023). In a related video (Taking Off, 2022b), a viewer made a
connection regarding pursuing their instrument rating after hearing a story of a pilot becoming
task-saturated and overloaded while flying in difficult instrument meteorological conditions: "I
plan to go for my instrument and will keep your story in mind. Hopefully it will help me and
others at some point" (davidmorton6115, 2022). Others indicated that the stories taught them
about advanced ratings and motivated them to pursue them. Referring to learning to fly seaplanes
(Airplane Academy, 2021c), "it's definitely on my to-do list" (robandmannie, 2021); and in a
story about pursuing a commercial rating (Airplane Academy, 2023b), the viewer said, "Good
stuff. I'm planning to start my commercial soon and everyone says it's so easy etc. but I'm
highly skeptical and try to keep from falling in that mindset. Good to hear you talk about that
aspect" (andregerard2335, 2023); and another added, "Excellent video. ... Had not heard these

tips anywhere else! Thanks so much for conveying these valuable lessons to us!"
(PilotJourneyPNW, 2023).

### *Indications of Vicarious Learning: General Aviation's Positive Impact*

Previously, the primary content theme of General Aviation Changes Lives and is Worth Pursuing was explored, noting specific examples of hangar flying content that focused on the impact general aviation can have on individuals and the world. In response to these types of hangar flying content, viewers commented with statements indicating they had vicariously gained knowledge. Some viewers indicated actions they may take, lessons taught, inspirations, and changed attitudes. One example is a story that brought awareness of the charitable aviation organization, Angel Flight (Aviation101, 2020). A student pilot viewer spoke of inspiration and a course of action: "Just soloed a few weeks ago and was already planning to make my mission Angel Flights (along with Young Eagles). This video will be on my mind every time I'm struggling through flight training as motivation to keep going" (peteralberti, 2020).

Another comment showed a learning connection to a more significant point of view regarding the impact of digital hangar flying content on general aviation culture. The viewer, commenting on a video in which the pilot storyteller admitted to committing some dangerous errors during a flight, said:

> It's not the errors that make us good or bad pilots, it's how we deal with them that counts. The ability for us all to learn and adapt from others' events is what's important here, and so I thank you for your candid review. This is the essence of an open safety culture that is so needed in aviation—that way we all learn. (EtiRats, 2023)

This last sentence connects this lesson to the larger general aviation community.

Finally, an example of the impact general aviation and hangar flying can have on the individual pilot emerged. In the story about pilot error (Short Field, 2022b), pilot viewers learned vicariously about short field operations from the story they watched. They also learned some essential personal lessons that affected their psychological state. As social cognitive theory posited, learning through observation has a definite effect on the psychological processes of the human mind (Bandura, 1986). The concept that hangar flying could be both educational and therapeutic was not a focus of this research but is nonetheless a fascinating discovery. In the referenced story from Short Field, the pilot discusses an attempted risky landing in unfavorable conditions and several other poor decisions that nearly cost him his life. His admission of his mistake and debriefing of the incident was helpful to many viewers, including one who said,

> I really want to thank you for this video. I look at these videos as a form of pilot therapy. While educational, I know for most of us, it helps put us at ease getting the reassurance that everyone makes mistakes. I had a flight today that was horrible. Nothing unsafe, but I was making stupid mistakes and tripping over myself the whole time. It left me and my confidence rattled and often times it's easy to feel alone in those moments. This video not only teaches me a lesson about short field operations and decision making but it also helps bury my self-destructive thoughts about my mistakes. We're all human but in the moment it's very easy to forget that it happens to everyone. Thank you for being so thorough and honest! (braylenfab6523, 2022)

These learning connections and others emerged regarding the impact of general aviation, illustrating that the belief that general aviation changes lives and is worth pursuing was shared not only among the pilot storytellers but also by those viewers who vicariously experienced the stories.

*Indications of Vicarious Learning: Regarding Adventure and Ownership*

Findings presented here reference indications of vicarious learning connections made by viewers regarding hangar flying stories with adventure and airplane ownership. Since fewer videos in the sample focused on these themes, there were fewer examples of vicarious learning. Viewers made direct and indirect comments regarding the lessons learned from the content.

Stories featuring adventures one can have in an airplane were often characterized by beautiful scenery and fun. These encouraged some viewers to learn that flying made these adventures possible. One viewer commented on a story of a pilot who flew his two-seat Cessna 150 to the Bahamas (Fly Me to the Fun, 2024): "One of the many reasons I'm getting my PPL right now at F45. Plan to make trips to explore the islands" (lndrvrus, 2024). Several other viewers commented that they had similar wishes to become pilots or gain experience so they could also embark on such adventures.

**Figure 9**

*Example of an Aviation Adventure*
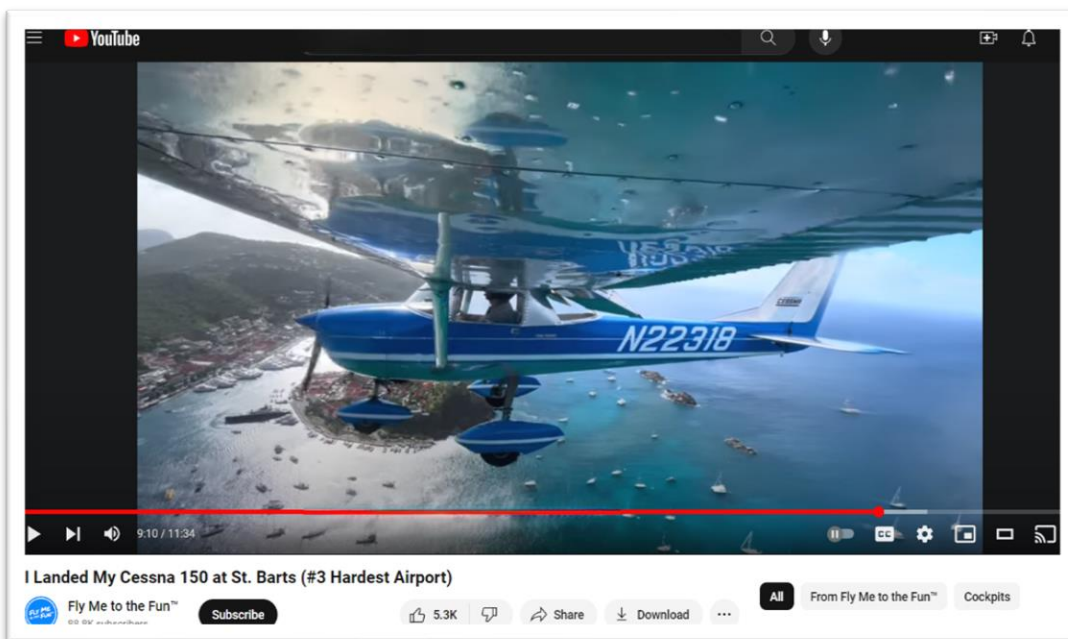
Inspired by the story of a missionary pilot in Papua New Guinea (Missionary Bush Pilot, 2021c), a viewer shared, "I live my flying dreams through your videos. Thanks for taking me along. Again. I can really see how this would be a dream job" (arthenry498, 2021). Others learned about the cultures of remote areas through the pilot's story-sharing: "Thanks again for the ride-along. I always love the flying, but my interest in other cultures makes the walk-arounds very interesting. I can't imagine myself living like that, but to them, it's perfectly normal" (davidbjornstad7759, 2021). Finally, one pilot who shared his experience of flying the Kodiak 100 (steveo1kinevo, 2018) sparked interest and motivation to explore from one viewer, who said, "I love these aircraft … make me think of starting amazing adventures in remote locations" (BrockInTheWorld, 2018).

These adventure stories illustrated learning connections viewers made between flying and adventure. Individuals commented on how flying was the means to have these unique travel experiences and showed an understanding of the reason for learning this skill. However, to fly to exotic places, one must have access to an airplane or learn how to purchase one.

Stories involving airplane ownership also showed learning connections as the viewers vicariously experienced the joys and sorrows of purchasing and owning an aircraft. Some viewers also shared joy and sorrow in what they learned from the stories. In "How to Actually Afford an Airplane" (FloridaFlying, 2023b), the pilot storyteller discussed that the only affordable way to own an airplane was to buy or build an experimental type, advice for which a viewer was grateful, saying, "Thanks for this video man!  In the market for a plane and you've definitely shifted my thinking. Cheers" (TheRealEstateJedi, 2024). This comment indicated that the viewer learned about experimental aircraft and now may purchase one because of knowledge gained through the story. The next viewer learned from the pilot storyteller information that

helped them purchase their own aircraft to finish training in (Airplane Academy, 2021a). The viewer thanked the pilot: "Thank you for sharing your experiences. They helped me through different parts of the process. Recently (last November) purchased a 1975 182 and got my PPL in January" (dank580, 2021). Finally, a viewer learned about the possible maintenance costs related to overhauling an aircraft engine, which, as the pilot storyteller described it, was not a pleasant experience and was very expensive (SoCal Flying Monkey, 2024). The viewer learned about unexpected costs and some of the sorrows of aircraft ownership and said, "I understand where you are coming from on ownership. I have the same thoughts… I absolutely love flying, but the cost at certain times makes me step back and ask if it is worth it" (tfabrizio623, 2024).

In summary, indications of vicarious learning were evident in the comments made by viewers of the hangar flying stories. Thus, the inference can be made that there is a connection between hangar flying and vicarious learning. As shown in the examples above, vicarious learning can take place through the storytelling experience. Pilot viewers learned what to do in some situations and what not to do in others, making them safer, smarter pilots. Far more examples could be presented as nearly every story in the sample contained these indications from viewers. However, the representations in the above paragraphs constitute a sampling of these indications. While some stories had little apparent indication of vicarious learning, the researcher posits that there was knowledge to be gained and lessons to be learned from each. Furthermore, the researcher believes that all the stories in the sample have educational value and purpose.

**RQ4: What primary goals of the digital hangar flying content can be inferred?**

The researcher was interested in discovering the exigency or motive of the story and storyteller. The goal was to understand the foundation of this kind of storytelling by understanding the central purpose of creating the content. If the purpose was discovered, was it

fulfilled? Was there any evidence to support the accomplishment of the storyteller's purpose? During analysis, the researcher noted possible purposes of the story's content and viewed and reviewed the digital artifact to clarify first impressions.

Additionally, the researcher studied the comments left by viewers to infer if the perceived motive of the storyteller had been accomplished. All stories were focused on sharing some experience with the viewer; however, the purpose of sharing that experience varied. The researcher found three primary purposes in the digital hangar flying stories: to educate, to entertain, and to inspire. Some stories were combinations of these with elements of education and entertainment, or education and inspiration. For example, in many of the stories seen on the Missionary Bush Pilot (n.d.), there is both education as the pilot shares his processes of flying, following checklists, avoiding weather, and landing procedures, as well as entertainment as the pilot tells of his adventures flying into remote jungle airstrips, using his aircraft-mounted cameras to show beautiful scenery, the people of Papua New Guinea, and some of his missions.

### Reviewing Purpose-Built, User-Generated, Overt, and Covert Content

As described earlier in this chapter, the sample included purpose-built content that was categorized as being created by an organization with a clear purpose and user-generated content that was created by an individual that may have had varying purposes. Purpose-built content would be that created by the Air Safety Institute (n.d.-a) to educate pilots about safety. In contrast, content created by steveo1kinevo (n.d.) in which the viewer shares the experience of his flights in Kodiaks, TBMs, and Cessna Caravans would be considered user-generated. As analysis continued, the distinction between these two categories blurred as some user-generated content had obvious purposes of educating, inspiring, or entertaining. While purpose-built and user-generated were retained to distinguish between the types of content creators—organizations or

individuals—additional ways to classify the content were created. These were named *overt* and *covert* storytelling content.

Overt storytelling content referred to videos containing a pilot in the storytelling act, while covert storytelling content was where a pilot was not directly telling a story but rather was sharing an experience in real-time. Overt content usually showed the pilot sitting in a chair, telling a story, while covert content often depicted a pilot sharing the experience of a flight while the viewer tagged along via cameras mounted in the cockpit and on the airplane to allow the vicarious experience of riding alongside the pilot. Much of the user-generated content, including Missionary Bush Pilot (n.d.) and steveo1kinevo (n.d.), would be considered covert, while stories collected from the Air Safety Institute (n.d.-b) were overt. These classifications of the hangar flying content benefit the understanding of the storyteller's exigency. As mentioned, the researcher inferred that the primary purposes of the digital hangar flying content were to educate, entertain, inspire, or some combination of these.

**Figure 10**

*The Purposes of Hangar Flying Content in the Sample*
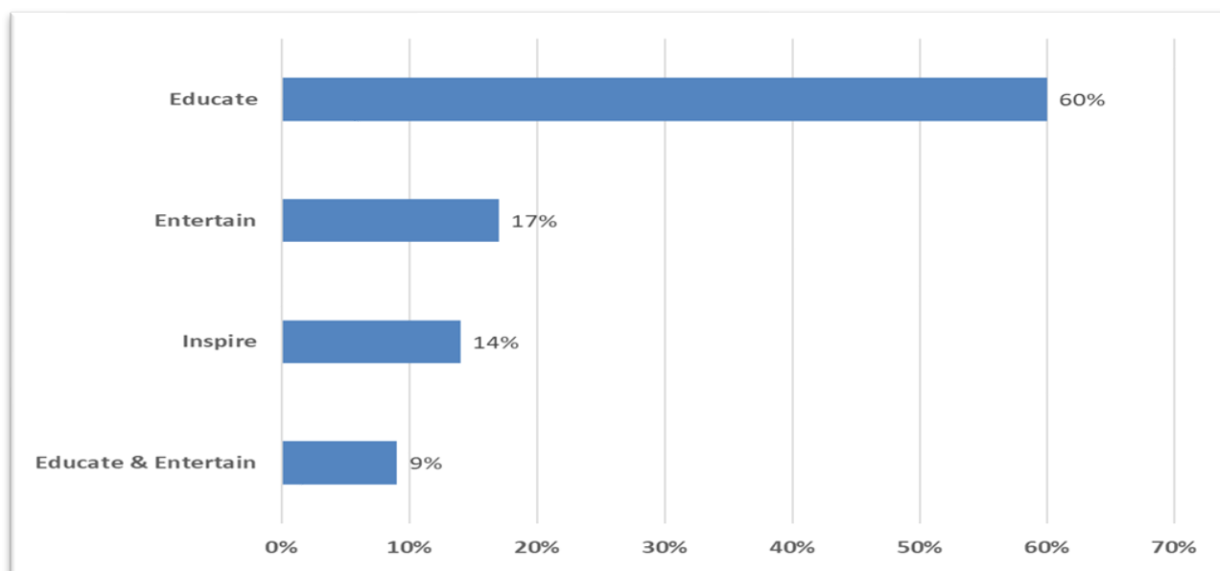
### Primary Purpose 1: To Educate

Many hangar flying stories were created to share knowledge with other pilots to make them safer and better pilots. Approximately 60% of the stories were determined to be primarily focused on educating the viewer, with a few others having some educational and entertainment purposes. The entire series created by the Air Safety Institute (ASI) (n.d.-b), titled *Real Pilot Stories*, is focused on providing educational video content to enhance the safety of general aviation operations. ASI describes the series, "Each Real Pilot Story is a true account of a good flight gone bad. Listen to pilots who really have 'been there, done that' tell their harrowing tales in hopes of helping the rest of us become better pilots" (Air Safety Institute, n.d.-b, para. 1). As a branch of the Aircraft Owners and Pilots Association (AOPA), "ASI is committed to reducing general aviation mishaps by providing free educational resources and supporting initiatives that improve general aviation flight safety and grow the pilot population" (AOPA, n.d.-c, para. 1). This series and its other content are purpose-built to make general aviation safer. A total of 18 hangar flying stories from ASI's *Real Pilot Stories* were included in the sample for this study. Some examples of these are "Real Pilot Story: Hidden Hazard" (2023b), in which the viewer is educated about the dangers of carbon monoxide poisoning during flight through the story of a pilot who survived a crash due to the effects, and "Real Pilot Story: Trapped On Top" (2016a), in which the viewer learns how to handle an emergency while trapped above the clouds with low fuel and no flight plan.

Several other stories in the sample came from educationally purpose-driven, overt creators like Taking Off (n.d.-a), a channel created by Dan Millican and Christy Wong. The channel features several series, one of which is titled *Pilot Stories!* (Taking Off, n.d.-b), and features pilots sharing their varied flying experiences. These stories included "Flying in the Polar

Vortex" (2019) and "IMC Overload at Class Bravo" (2022b). Many artifacts from Taking Off (n.d.-b) are educational, while a few are simply entertaining hangar flying tales.

Beyond the Air Safety Institute's (n.d.-b) series and Taking Off's (n.d.-b) educational content, several user-generated stories were also focused on educating the pilot viewer. Examples include "The Reality of Owning Your Own Airplane" (Airplane Academy, 2021b), in which Pilot Charlie educated prospective aircraft owners about aircraft ownership's various costs and benefits, and "Oshkosk23 Fisk Arrival Mistake-Analysis" (Blue Sky Flight, 2023), in which the pilot shared his near-accident story to help others learn from his mistakes and become safer pilots.

Many hangar flying stories primarily aimed to share a lesson or pass on knowledge to pilot viewers, usually motivated by increasing safety in general aviation. The author's hangar flying story in Chapter 1 also had educational messages: to practice preparation for flights and to learn from his mistakes. Like that story, the researcher found educational elements in all the stories selected for the sample, although education was not the primary purpose in some.

### Primary Purpose 2: To Entertain

Choi (2018) discussed the entertainment value digital storytelling offers viewers, specifically in YouTube videos. Harrison (2021) noted that hangar flying storytelling in aviation was often done with entertainment as its primary focus. While both of these scholars also spoke of the educational possibilities of digital storytelling, both acknowledged that an entertaining story was often more well-received by listeners. The digital hangar flying stories selected in this study's sample also contained those whose primary purpose was determined to be focused on entertainment. Approximately 17% of the digital hangar flying sessions included in this sample were considered to have a primary purpose of entertainment.

Some of these video stories were focused on providing entertainment through the sharing of a unique flight experience like "I flew my girlfriend to the Dominican Republic" (Fly Me to the Fun, 2023b), "Crazy Flight Leaving Oshkosh" (FlywithKay, 2023c), or "On the Job Flying the Mighty Kodiak!" (steveo1kinevo, 2018). Picturesque scenery, in-flight footage of the airplane, and adventure characterized the kind of entertainment provided in those stories. Others focused on sharing the pilot's humorous experience while flying, and the humorous stories were the most common kind of entertainment found in this digital hangar flying content. Such stories included "Losing Engine and Instructor" (Taking Off, 2023f), in which Brian Schiff told of his elderly tailwheel instructor falling asleep in the seat behind him during a lesson and then experiencing an engine failure, which she slept through. Another entertaining story from Taking Off (n.d.-b) was "Dodging Cows and Picking Up Mike" (2023c), which is the story of a pilot who tells of needing to avoid cows on the runway during takeoff and landing. The last humorously entertaining story to share is titled "Dealing with a Leak InFlight!!" (Taking Off, 2023g) and tells the story of a pilot who needed to urinate during a long flight. He could only find an empty bottle to use, and he did so only to discover the bottle was leaking all over him.

There were other stories focused on entertainment, which are somewhat obvious from the titles, such as "Drunk Aggie Steals Plane!" (Taking Off, 2022c) and "Naked and a Pilot! Joe Casey: French Reality Star!" (Taking Off, 2023e). Although second to educational purposes, entertainment was also found to be a significant part of the hangar flying experience and is often found alongside educational content. This finding aligns with Choi (2018) and Harrison (2021), who saw both elements as part of effective digital storytelling and hangar flying.

### *Primary Purpose 3: To Inspire*

Approximately 14% of the hangar flying stories were determined to have a primary purpose of inspiration. The researcher inferred that the goal of these storytellers was to motivate, uplift, or inspire the pilot viewer in various ways. Some stories aimed to motivate viewers to learn to fly, such as "Why You Need to Get Your Pilot License" (SoCal Flying Monkey, 2022) or "No One Warned Me About This Struggle in Flight Training" (Airplane Academy, 2023a). Some inspirational stories tell the viewers how the pilot began their aviation journey. Stories such as "Koby D. Reed's Aviation Story" (Fat Tire Cowboys, 2019), "Who Is the Fire Pilot?" (The Fire Pilot, 2021), "My Aviation Story—22-Year-Old Gulfstream Pilot" (Huber, 2019), and "How I Became a Bush Pilot in Papua New Guinea" (Missionary Bush Pilot, 2021c), all told personal stories of fulfilling their flying dream and their overall piloting journey. The pilot storytellers were passionate about aviation and desired to inspire others to pursue it. All shared similar sentiments as these: "Whether it's aviation or whatever goal it is that you have in life, never stop chasing, never give up" (Fat Tire Cowboys, 2019, 2:54), and "the goals that take the longest to achieve are by far the most rewarding. I truly hope you can get started on your aviation journey, it just might change your life like it did mine" (SoCal Flying Monkey, 2022, 8:12).

There were inspirational stories of using aviation to serve others, such as "Getting There is Half the Cure–Angel Flight–Cessna TR182" (Aviation101, 2020) and "Cessna Saves Boy! Rescue in Papua New Guinea" (Taking Off, 2023i). These two stories brought awareness of two charitable organizations that use aviation to help save lives, which many viewers found inspirational. Additionally, a few stories shared how inspiring the general aviation community was as experiences were shared of pilots helping other pilots out of challenging situations. These

uplifting stories were found in "Trapped in My Own Plane" (Fly With Bruno, 2021), which told

of a pilot who was trapped by his locked canopy and was rescued by some friendly pilots who

stopped to help, and "I Made Such a Dumb Mistake (But the Flying Community ROCKS!)"

(Airplane Academy, 2022). In that story, the pilot forgets his credit card and has no way to pay

for fuel, but he is rescued by two friendly pilots who show him kindness and pay for his fuel

without him knowing about it.

Several other stories in this sample had some inspirational elements, although they were

not the primary purpose. A few from the Air Safety Institute's (n.d.-b) *Real Pilot Stories,* like

"Powerless over Paris" (2019) and "Trapped on Top" (2016a), told of the heroic efforts of air

traffic controllers who went above and beyond their duties to save pilots in emergencies. These

hangar flying sessions were not focused on humor or education but more on motivating the

viewer to aspire to greater things, chase dreams, or believe in the power of good.

### *Primary Purpose 4: To Educate and Entertain*

The remaining few video stories were deemed as having elements of education and

entertainment combined in such a way that it was challenging to determine a singular primary

purpose. For example, one pilot gave a complete account of his experience flying a new Kodiak

900 airplane valued at over $3.9 million (Airplane Academy, 2023c). The pilot told the story of

his flight and shared information about the airplane, but he also had in-flight footage, making the

video similar to a ride-along. These aspects were deemed both educational and entertaining. This

mix of passing on knowledge along with a purpose to provide a degree of entertainment is also

seen in the lengthy story of the pilot who purchased an abandoned Mooney aircraft that had been

sitting in a field and recounted his salvage operation (Pepke, 2023). The pilot shared the story of

his experience, which is educational for anyone interested in salvaging aircraft, and entertaining as there are mishaps and other issues the pilot faced along the way.

Several videos from the Missionary Bush Pilot (n.d.) were categorized as educational and entertaining due to the pilot's multi-camera footage of picturesque scenery and aircraft landings and takeoffs. The pilot talks to the cameras in the cockpit as if speaking directly to the viewers who are vicariously riding along with him. While doing so, he shares his checklists for operating the airplane, talks about how he will make an approach to land, how he is handling the weather, and so on. His apparent dialogue with the silent viewer in the right seat is educational, although not in the form of direct teaching. Learning is far more an incidental or covert result. He tells the viewer what he is doing, often explaining why something is happening or why he has made a particular decision. Through these shared experiences, the viewer is vicariously learning about aircraft systems, handling adverse weather, flying through mountain passes, landing on grass and dirt runways, maintaining the center of gravity while loading an airplane, and other bush flying operations. All the while, the viewer gets a glimpse of what missionary aviation is like, the cultures of the people of Papua New Guinea, and the inflight footage of all his flights through mountains, valleys, over the ocean, and more. Viewers seemed to enjoy the multiple purposes of the content, with one saying, "Terrific channel that is a delightful combination of educational, inspirational, and informative" (petruzzovichi, 2021). The content included in this study from Missionary Bush Pilot (n.d.) mixes two purposes, creating hangar flying that is both educational and entertaining, just as Harrison (2021) described. The videos share information, knowledge, adventure, and a unique vicarious experience from a cockpit vantage point.

The goal of Research Question 4 was to make inferences regarding the motivation or exigency of the storyteller in sharing the content found in the hangar flying videos. After careful

analysis and categorization, the researcher determined that the primary purpose of most of the

digital hangar flying content selected for this study was to educate general aviation pilots by

sharing some aviation experience to create safer, more skilled pilots. Secondary purposes were to

entertain and to inspire, with a small percentage combining aspects of education and

entertainment.

## Summary of the Chapter

Chapter 4 presented the findings from an in-depth thematic content analysis of 110

YouTube videos, which the researcher deemed examples of digital hangar flying content. Hangar

flying video stories included in the sample were a mix of purpose-built, user-generated, overt,

and covert content. Findings were organized and presented to answer each of the four research

questions (RQs) in the study, with supporting narratives from the content and viewer comments.

For RQ1 and RQ2, primary themes were identified for the content of the hangar flying stories

and the viewer responses, along with subthemes. Additionally, inferences were made regarding

vicarious learning connections found in the viewer comments to answer RQ3 and the primary

purposes or exigency for the story and storyteller to answer RQ4. Chapter 5 will discuss the

findings, implications, delimitations, and limitations and provide suggestions for future research.

## CHAPTER 5: CONCLUSION

### Overview

Specifically focused on digital hangar flying and employing a qualitative content analysis approach, the research project examined 110 online hangar flying stories shared by general aviation pilots in videos posted on YouTube. The goal was to identify emergent themes within the content and indications of vicarious learning within the viewer's comments. Further, inferences were made regarding the story's possible purpose. The study's findings support the value of storytelling, specifically hangar flying, as a communication practice for vicarious learning, sharing knowledge, and influencing the personal flying culture of general aviation pilots. This study has provided initial exploratory research on hangar flying as a communication practice, filling a gap in communication research. Additionally, the study has provided support for hangar flying's use as a potential supplement to formal flight training, addressing the urgent need to increase safety and decrease accidents in general aviation.

This chapter includes a summary of the findings detailed in Chapter 4, expounds on selected concepts from the findings in a discussion section, and then presents the research's theoretical, methodological, and practical implications. Next, the study's delimitations and limitations are explained, preparing the reader for a robust final section where several possibilities for future research regarding hangar flying and vicarious learning are proposed.

### Summary of Findings

While the concept of hangar flying is well known in the aviation community and has been written about by Harrison (2021), Vandenputte (2021), Kruschwitz and Roth (1999), and others in books, magazines, online publications, podcasts, and videos, there is a lack of scholarly research and study exploring its unique impact as a storytelling device for imparting knowledge

and influencing behaviors. This research study has produced valuable outcomes concerning how

general aviation pilots gain informal flight education through digital narratives and how these

stories influence their aviation experiences and behaviors. This research could provide new

opportunities for enhancing pilot training, improving flight safety, and strengthening the general

aviation community. This section briefly reviews the study's findings, organized via the study's

four research questions.

**RQ1: What are the primary themes of the digital hangar flying content?**

Five primary themes were identified in the sample of online hangar flying stories

gathered from videos on YouTube. These content themes were a) general aviation can be risky,

b) general aviation pilots must prioritize safety, c) general aviation pilots should never stop

learning, d) general aviation changes lives and is worth pursuing, and e) general aviation can be

fun and provide extraordinary opportunities. Subthemes were also identified for each primary

theme, illustrating nuances within the sample that were worthy of exploration.

The primary themes and subthemes shared connections, which became apparent multiple

times. Within several stories, the plot was often the same. The pilot illustrated the dangers of

flying by recounting the story of an emergency, discussed the specific way it was safely

mitigated, and then encouraged the pilot viewer to learn from the mistakes and decisions made so

that they might become a safer pilot. In this way, Primary Themes 1, 2, and 3 were connected as

the dangers of flying lead to the need to mitigate the risks, and the way this mitigation is done is

through learning new skills and staying proficient. These connections were also seen in the

subthemes.

Most hangar flying stories in the sample presented the idea that general aviation can be

potentially dangerous. Pilots must mitigate that danger and strive to become safer in the sky.

Pilots accomplish this primarily by continuing to build knowledge, hone flying skills, and learn from the mistakes of others through hangar flying. Further, pilots must commit to avoiding hazardous attitudes and strive to be the most educated and safe pilots possible so that they can enjoy the adventures, connections, and unique opportunities that aviation provides.

**RQ2: How do the viewers of the digital hangar flying content respond to it?**

Analyzing the viewer comments on the videos provided insight into how this type of storytelling content is received and perceived by general aviation pilots who may consume this information. Further, by looking at the content of the comments, the researcher determined the overall sentiment of the responses and possible indications of how the story influenced the viewers. The overall sentiment from viewers was positive, with many showing gratitude and support for the pilot storyteller. Viewers often expressed their thankfulness for a valuable lesson learned from the story and indicated that they may alter future behaviors due to the story's impact on them. Some negative comments were also noted; however, these were a minority among the 35,000 cumulative comments left for the 110 videos in the sample.

The researcher identified four primary themes throughout the comments for the hangar flying stories: a) learning from others' mistakes is valuable, b) gratitude, c) safety must be every pilot's number-one priority, and d) a shared love of aviation. These messages were found woven into many of the comments posted for the videos, some more prevalently than others. Comments also revealed multiple examples of reciprocation in which commenters would tell their own story in response to the video's content, often followed by another commenter replying to the first with a new story. This mutual exchange and back-and-forth storytelling were found in the comments of multiple videos, an interaction that suggested a bond between the pilot storytellers and viewers. These reciprocations illustrated the true nature of hangar flying.

Additionally, the researcher found indications of parasocial relationships between viewers and content creators. Many commenters indicated an intimacy or familiarity with the pilot storytellers, often related to personal issues, previous videos, or physical appearance. This familiarity was present despite lacking evidence of any authentic relationship with the storyteller. While these parasocial interactions seemed superficial and innocuous in the sample, determining the breadth and depth of the viewers' perceptions was beyond the scope of this research.

Overall, the response to the hangar flying content was positive. Viewers expressed gratitude for the pilot storyteller's shared experiences and often commented how valuable the content was in helping them gain knowledge that would save their lives and the lives of other pilots in the future. Many also commented that the type of hangar flying content was a valuable tool for pilots to learn from other's mistakes and experiences, making the general aviation industry safer.

**RQ3: What inferences can be made concerning a connection between vicarious learning and hangar flying?**

Multiple examples of possible vicarious learning connections were found in the viewer comments on nearly all the hangar flying stories in the sample. Some commenters indicated they had learned a specific lesson or would change their flying behaviors based on the story. In contrast, others' comments were more indirect, saying the story was valuable for all pilots. In keeping with the method of this study, the indications of vicarious learning connections were categorized into four themes: a) safety must be a pilot's number-one priority, b) pilots should always be learning, c) general aviation's positive impact, and d) regarding adventure and ownership. The researcher identified these four dominant or recurring themes amongst the inferred indications of vicarious learning.

The author acknowledges that it was beyond the scope of this research to determine if the pilot viewers changed their flying behaviors or attitudes after watching a video. However, based on their comments, it can be inferred that social learning occurred during these online hangar flying sessions. Although many indicated that they had learned valuable lessons, that these stories would make them safer pilots, or that they would now fly aircraft differently, it is unknown if the viewers followed through on their statements. The goal was to make inferences about the possibility of vicarious learning, which was accomplished. The inference can be made that there is a connection between hangar flying and vicarious learning; thus, the researcher posits that pilots can use hangar flying to vicariously learn skills and knowledge that can supplement their continuing aviation education.

**RQ4: What primary goals of the digital hangar flying content can be inferred?**

As in the previous question, drawing definitive conclusions regarding the exact exigency or motivation of the storyteller and content was beyond the scope of this research. Again, inferences were made based on the researcher's interpretation of the hangar flying content and the accompanying viewer comments on each video. The researcher inferred that the primary goals of the hangar flying content in the sample were education, entertainment, and inspiration. A minority of videos seemed to be combinations of the primary themes. For example, the content from Missionary Bush Pilot (n.d.) often contained elements of education and entertainment. The pilot illustrated good checklist flow and procedure while exciting the viewer with his expert landing at a muddy grass strip on the side of a mountain.

Several of the videos selected for the sample were deemed purpose-built content, which had been created for the explicit purpose of educating, entertaining, inspiring, or some combination. For instance, it was inferred that the content selected from the Air Safety Institute's

*Real Pilot Stories* (n.d.-b) was to educate pilots concerning aviation safety, while some of the user-generated content, like videos from steveo1kinevo (n.d.) or SoCal Flying Monkey (n.d.), may have been created with a motivation to educate and entertain. The researcher inferred that approximately 60% of the stories selected were made to educate general aviation pilots about safety, ownership, avoiding mistakes, or other topics.

Although it could not be definitively determined that the storytellers' goals were accomplished, the viewer comments on the sample videos often indicated that they had been educated, entertained, inspired, or some combination of these. Thus, it could be inferred that education, entertainment, and inspiration were outcomes of the hangar flying stories.

## Discussion

This study explored hangar flying as a communication tool for vicarious learning in the broad development of general aviation pilots' personal flying culture. Within this exploration, the research addressed two problems proposed in Chapter 1: a) the lack of scholarly studies concerning hangar flying as a communication practice, and b) how hangar flying might be used to correct possible deficiencies in formal pilot training as an informal educational supplement.

The findings of this research study have created initial research regarding hangar flying, specifically, digital hangar flying, that addressed gaps in communication and aviation scholarship and provided a foundation for future research in both fields. The research findings also strongly indicated that the storytelling practice of hangar flying has evolved from a story shared around a table to online communities of individuals worldwide and is integral to the aviation community's culture, safety, and future. Further, pilots can benefit from hangar flying by vicariously learning information that can make them safer and more proficient aviators simply through observing and listening to others' experiences. Engaging in hangar flying is a way for

pilots to learn from others' errors without risk to themselves, potentially preventing their injury or death and increasing the overall safety of general aviation.

From the findings, it is now better understood that there is a connection between storytelling and social learning, strengthening theoretical perspectives on narratives (Fisher, 1984) and vicarious learning (Bandura, 1977). From the findings, it can also be understood that stories can influence personal flying culture, as the pilot viewers indicated the cultivation of ideas and concepts from the hangar flying videos that they would integrate into their future flying practices. Specifically, pilot viewers commented the most frequently about story content concerning increasing safety and a commitment to lifelong learning as influencing their ways of flying. These influences strengthen the theoretical perspectives of cultivation (Gerbner, 1969) and social cognitive theories (Bandura, 1986). As this is a qualitative study, the goal was not to prove or disprove these theoretical perspectives but to use them as lenses to view the communication phenomenon of hangar flying (Creswell & Creswell, 2018).

The extensive findings of this research study could provide many points of discussion; however, several takeaways stand out as most significant.

**Strengthening Communication Research**

Although hangar flying is well known in the aviation community and has been written about in blogs, magazines, and online articles, the phenomenon has not been discussed much in the scholarly literature of communication or aviation until now. Thus, the findings of this study significantly add to the body of communication research concerning the impact of storytelling as a vicarious learning tool and, more specifically, the role of the aviation pastime of hangar flying as a valuable communication tool for the continuing education of general aviation pilots. The study's findings provide a foundation for future research and discussions regarding hangar flying

as not simply an entertaining tradition but a viable supplement to general aviation flight training. The study benefits all those in general aviation, such as certificated pilots, student pilots, flight instructors, aviation enthusiasts, and industry leaders, as it explores the impact of an informal communication-centric educational tool that may bolster pilot proficiency.

**The Primary Focus of Online Hangar Flying: Flight Safety**

The findings indicated that most of the digital hangar flying content in the sample was focused on teaching a lesson primarily about flight safety, especially those deemed purpose-built videos. It was inferred that those who watch these videos are there to receive information that will make them safer and more proficient pilots, and that they click on a video title like "Real Pilot Story: Cold Weather Catastrophe" because they are curious about the story and want to see what they can gain from it (Air Safety Institute, 2023c). In the study, many viewers commented that they learned valuable lessons that would save lives and prevent future injuries or mishaps. The findings further suggested that a primary reason that individuals engage in hangar flying is to learn how to avoid death, accidents, and mistakes. One student pilot commenter said, "I've been hesitant to watch these types of videos for fear of it scaring me off. However, I've decided to watch all of them as part of my education. This was a very valuable video…" (snowgoose52, 2024). Since previous data has shown that general aviation is inherently dangerous (National Transportation Safety Board, 2021), it is probable that pilots engage in the informal practice of hangar flying and other ongoing educational endeavors to mitigate those dangers. Pilots cannot afford to make all the mistakes themselves as it would be too deadly a practice. Thus, pilots need to learn vicariously through the experiences of others, whether that be in face-to-face communication encounters or by watching online videos of pilots sharing stories of how they mitigated some dangerous situations while flying.

Many videos focused on decreasing pilot errors by telling stories about pilot errors. The hope here is that by discussing the incorrect actions of one pilot, another might be saved. The story from Blue Sky Flight (2023) was an example of one pilot sharing his near-fatal mistakes with others so that those pilots watching would learn from his story and avoid making those same errors, thus prolonging their lives. Regarding his errors in following procedures at the Oshkosh airshow, Pilot Bob said,

> I thought it was very important that I take a deep dive into exactly what I did wrong to make sure that no one else makes that same mistake so I'm going to walk us through the process of me flying in there [to] show you where I made my mistake, what could have happened as a result of that and hopefully we all learn from that mistake. (Blue Sky Flight, 2023, 2:27)

The pilot later said that he made the video and consequently revealed his errors on the Internet to keep others safe and "raise awareness … because it can happen to anyone" (35:03).

Safety was cited as the highest priority of the Federal Aviation Administration (2019). Thus, it makes sense that much of the content in the hangar flying videos produced by individuals and organizations was focused on safety. Flight safety is a priority for the aviation world's governing body, many other entities, and individual pilots. The Air Safety Institute's *Real Pilot Stories* (n.d.-b) series on YouTube aims to use hangar flying storytelling to promote safety. It is a viable model for other aviation organizations to follow in creating digital content focused on decreasing pilot error and increasing general aviation safety.

As previous research in this study has shown, flying within general aviation carries inherent dangers. This research discovered that because of this fact, most hangar flying content was focused on increasing flight safety. So, how do individuals continue to do something that is

inherently dangerous? The answer is that pilots and all those who enjoy general aviation must work to build and promote a culture of safety fueled by a commitment to life-long learning. Hangar flying is integral to this process, as is learning new skills, refreshing current ones, and always being ready for the next lesson. Reading aviation magazines, listening to podcasts, participating in social media groups, sharing stories with other pilots around the airport, and watching videos of others' flying experiences are all critical to building and maintaining a culture of learning so that general aviation becomes safer for all.

**Hangar Flying Enables Vicarious Learning**

This research explored a possible connection between hangar flying and social learning. Bandura (2012), who developed social learning theory, noted that storytelling effectively enabled vicarious learning and brought about personal change. The findings supported Bandura's conclusion, indicating that digital hangar flying content can foster vicarious learning among general aviation pilots. Pilots can learn what to do in an emergency by watching and listening to another pilot share their story of how they handled an emergency. Vicarious learning is seen in a viewer comment regarding a story of an inflight fire emergency: "Thanks for sharing this story. I'm a renter pilot and I'm going to make sure that checking for a fire extinguisher is part of my preflight from now on" (jasontatum7152, 2014). The "Real Pilot Story: Lost Elevator" (Air Safety Institute, 2022a) yielded this insight from a viewer: "I learned so much and you reminded me to develop the part of myself that is proactive [and] prepared, all the things that make me a better pilot and a better person. Thank you!" (scrappiemaddie518, 2022). The visual nature of this content, in which one can see and hear what happened to another pilot, creates a robust vicarious opportunity that hypothetically places the viewer in the cockpit without the dangers the storyteller encountered. For example, the pilot viewer can learn more about procedures from

watching the Missionary Bush Pilot's (n.d.) methodical use of checklists during a flight or learn how to recognize icing conditions from listening to the pilot's story in "Real Pilot Story: Cold Weather Catastrophe" (Air Safety Institute, 2023c).

Previous work by Alvarado et al. (2020) found in their work with young entrepreneurs that learning from the failures and mistakes of others in one's field can be very beneficial to shaping future behaviors. Learning vicariously through the experiences of others, especially their mistakes, has great value, which many pilot viewers in the study indicated. Direct experience may remain the best teacher, but the second best is vicariously learning from others' experiences of what actions to reproduce and which to avoid. One viewer said regarding a story in which near-fatal mistakes were made, "It's the experiences like this from which we both survive and learn from that makes us better pilots" (ibgarrett, 2023); and another said, "Reflecting on the mistakes is a great learning process" (petermorgan2104, 2022). The study showed that many hangar flying stories focused on the dangers of flying small aircraft and that sharing experiences to help others avoid those dangers was valuable. Further, the data suggests that general aviation pilots must strive to learn vicariously through each other's stories and experiences, as the flying endeavor is far too deadly for each one to make all the mistakes themselves. A final viewer comment clarifies this idea: "Thank you for your selfless sharing so that we don't have to go through the same thing to learn these valuable lessons!" (chouleo8152, 2023).

The findings also suggested that vicariously learning through hangar flying stories has the potential to save lives and influence future piloting behaviors. One significant example was found within a hangar flying story in the sample. In the story "Real Pilot Story: Trouble Over Paradise" (Air Safety Institute, 2024), the pilot storyteller recounts the tale of becoming incapacitated, necessitating that a non-pilot passenger fly and land the plane safely. The

passenger (Darren) had a vicarious learning experience earlier in this troubled flight that helped

him successfully pilot the aircraft to a safe landing. Although lengthy, this story within the story

provides validation that vicarious learning can occur through storytelling and that it can save

lives:

But I'll tell you a little story. On the way over, we were flying and Darren was with us on

the initial trip over. And we were flying and at this time I was sitting in the right seat and

the owner was sitting in the left seat to get some left seat time. So as we're descending out

of 12,000 ft., Philip got just a little fast on the airspeed. And all I said on the headset was,

"Hey, just watch your airspeed." Darren was on the headset as well in the back and he

said, "What does that mean? Can we go too fast?" I went, "Yeah, we can go too fast, you

know." He goes, "Well, what's going to happen?" I said, "Well, if you go too fast you,

know you, overstress the airplane and, you know, things could start breaking." And he

said, "Well, what's the worst that could happen?" I said, "Well, the worst that could

happen is our wings rip off and basically we become a lawn dart." So we laughed about it

and, you know, that was it. After this whole incident, I was talking to Darren and I asked

him, um you know, "I don't understand..." because I looked at the track log and we were

doing like 295 knots over the ground. The Caravan is not designed to do that. I couldn't

understand how he just didn't rip the wings off. And he said, "Well you probably don't

remember our conversation." I went, "What do you mean?" He said, "Well, on the way

over, we were talking about things and you said something about, you know, ripping the

wings off so I knew not to pull back really quick on the yoke when uh we were in that

dive. I knew I had to slowly pull us out of that dive or something bad was going to

happen." So he remembered that, just that little conversation we had and that probably is

what saved everybody's life. (Air Safety Institute, 2024, 11:24)

The last sentence of this story is the most important. Hangar flying stories are undoubtedly

sources of vicarious learning, and thankfully, Darren retained that learning and chose to

reproduce actions that led to the best possible outcome.

Although indications of vicarious learning were not always obvious, the researcher

believes there was a lesson to be learned in every hangar flying session in the sample. The

researcher learned many valuable lessons from conducting this study that he will use to improve

his flying skills. These lessons include the importance of carrying a backup radio, not flying at

night over open water, and making sure the airplane he is flying is equipped with a working

carbon monoxide detector and accessible fire extinguisher. The researcher feels that he is a much

wiser and safer pilot now due to watching and learning from the videos in the sample and that the

vicarious education received may save his life one day.

**Hangar Flying's Influence on Personal Flying Culture**

Underlying the goals of this research was the concept of how vicarious learning through

hangar flying may contribute to a general aviation pilot's personal flying culture. A *personal*

*flying culture* was a term created by the researcher that refers to a pilot's worldview or

perspective on flying aircraft. This personal flying culture might bear characteristics of safety,

risk-taking, frugality, adventure, or some combination of traits. Previously cited research by

Yilmaz et al. (2019) concluded that one's culture is often attained through social learning,

leading individuals to model behaviors aligned with what they have seen others say and do. This

study supports this conclusion and infers that through the communication and curation of

narratives, or hangar flying stories, pilots come to understand the world of aviation and construct their personal view of it, thereby shaping the kind of pilot they become.

While definitive conclusions could not be made from the research study alone, there was data to make inferences regarding the pilot viewers' personal flying cultures. It could be inferred that since the primary themes of the content were focused on risks, increasing safety, and learning, viewers that follow aviation YouTube channels that produced such content would have similar focuses in their flying cultures. Hypothetically, this inference means that if Pilot Tim watched stories about surviving emergencies, Tim's personal flying culture would likely focus on safety, preparation, or risk mitigation. Perhaps, if Pilot Wes watched hangar flying videos about flying and landing airplanes in remote mountainous areas with short grass landing strips, a desire for adventure, fun, or risk-taking may characterize his flying culture. If the pilot viewers engaged in the content from the Air Safety Institute (n.d.-a), it could be inferred that those pilots desire to build cultures of safety.

### Learning From Others' Mistakes and Triumphs Influences Personal Flying Culture

The findings of this research showed that the primary themes of the viewer comments were learning from others' mistakes and safety. Thus, it was inferred that most viewers who watched the digital hangar flying content were interested in gaining knowledge from the storytellers, not being entertained. Combining this idea with the finding that most of the content was purpose-built and focused on flight safety education, it can be inferred that most pilot viewers' flying cultures are characterized by a desire to learn from others' experiences, mistakes, and triumphs to be safer pilots themselves. To the researcher, hangar flying content seemed to significantly influence how pilots viewed aviation. Some viewers indicated this influence in their

comments and illustrated that the stories have impacted their flying habits, learning, and desire to

make positive contributions to general aviation. One viewer noted,

> It's not the errors that make us good or bad pilots, it's how we deal with them that counts.
>
> The ability for us all to learn and adapt from others' events is what's important here, and
>
> so I thank you for your candid review. This is the essence of an open safety culture that is
>
> so needed in aviation—that way we all learn. (EtiRats, 2023)

Just as Chae's (2021) work found that YouTube makeup tutorials influenced young

female viewer's sense of empowerment and individualism and created a personal culture

cultivated from the observed behaviors of the content creators, hangar flying content can have

the same kind of influence on a pilot's broad development of personal flying culture. Fraser

(2020) said that humans often "fashion our life in and through the telling and hearing of stories"

(p. 13), and one can infer from this study's findings that viewers' perspectives of flying and life

were influenced in this way by pilot storytellers. For example, some viewers indicated this

influence in comments, like "I pull up your channel whenever I get discouraged. They keep me

passionate as I work through school" (annacarl8966, 2021); "I live my flying dreams through

your videos. Thanks for taking me along" (arthenry498, 2021); and "One of your videos is what

helped inspire me to start my flight training and go into bush flying. That was five or so years

ago, and now I'm almost done with commercial and going into CFI" (abbiemavi, 2021).

### *Reasons Pilots Choose Particular Content*

Various reasons may bring a pilot viewer to a particular hangar flying story on YouTube.

Those drawn to content focused on aircraft ownership may be in the market for an aircraft and

want to learn about the pros and cons of renting or buying. Hence, they watch "Why I Finally

Stopped Renting and Bought a Plane" (Airplane Academy, 2024), or they enjoy the thought of

salvaging a treasure in a barn or field as the pilot did in "The Story of an $8,000 Mooney Aircraft" (Pepke, 2023). Other pilots' personal cultures may be safety-focused; thus, they are drawn to the stories of how to handle emergencies and mechanical malfunctions while flying. Stories like "Throttle Stuck on Landing Emergency!" (Taking Off, 2023m) or "Sudden Electrical Fail in IMC" (Taking Off, 2022e) may interest pilots whose culture is educationally and safety-driven. They want to learn more about these issues to mitigate the risks if they ever face similar circumstances. Others may simply partake of some hangar flying content because it is entertaining, such as the story, "Dealing with a Leak InFlight" (Taking Off, 2023g), which told of the pilot who needed to urinate during a long flight but only had a leaky bottle to use, resulting in an embarrassing, but humorous tale. Some pilot's cultures are adventurous, so they are the ones likely to watch the Missionary Bush Pilot (n.d.) and stories from the sample like "I Landed My Cessna 150 at St. Barts" (Fly Me To The Fun, 2023a) and "What Training In a Super Cub On Floats Was Like - It was WILD!!" (Airplane Academy, 2021c). Although this qualitative study cannot draw definitive conclusions regarding a specific pilot's personal flying culture, strong inferences can be made based on the hangar flying content that a pilot engages in.

**Hangar Flying on YouTube Could Be a Viable Educational Tool for Pilots**

Choi (2018) and Sui et al. (2022) concluded that YouTube was a viable educational resource for those seeking knowledge on various subjects. This study affirmed their conclusions through pilot storytellers who spoke of learning life-saving lessons from studying YouTube videos (Texas Outdoor Ventures, 2022; Blue Sky Flight, 2023; Air Safety Institute, 2015; Fly With Noel Phillips, 2023). Comments such as "stories and safety shares like this will save lives" (gregsanders7610, 2021); "this is such a valuable, important video showing a pilot making such a professional decision that probably saved their lives. A real role model to me, honestly"

(aviator_thomas, 2019); and "these videos really push home not being overconfident and complacent" (garywilliams9678, 2022) are examples that digital storytelling can be a valuable life-saving educational resource. Viewers also spoke of how online content helped them augment and correct deficiencies in their formal flight training to avoid future mishaps. In reference to a story about a pilot who overloaded his airplane and subsequently crashed on takeoff (Air Safety Institute, 2022b), one viewer said, "My instructor was extremely blasé about performance calculations during training. Were it not for my habit of listening to hours of accident reports and educational content here on YouTube, I might have ended up like these guys" (JETZcorp, 2022). Finally, the value of this kind of informal YouTube education for pilots is seen in this viewer's comment:

> I'll keep watching these videos and learning as much as I can, but especially learning about what can go wrong sometimes, and try to keep those scenarios in the back of my mind with hopes that I never get into those situations and, if I do, perhaps I may have learned something, that might help me get out of it. (jasonjohnston94, 2023)

The data suggests that YouTube provides general aviation pilots a way to continue their education beyond formal pilot training. Digital hangar flying stories like those found on YouTube provide a unique informal educational opportunity where pilots can, in a sense, choose their own classes with specific topics. Pilots could learn about multiple subjects, from dealing with thunderstorms to managing a stuck throttle, to building an experimental aircraft. Pilots can curate their educational experience by selecting only the videos and content creators they wish to learn from and filtering out what does not apply to their interests. Digital hangar flying is unique in that pilots can gather their favorite aviation storytellers in one place, just as if they could invite them to sit around the table at the airport and enjoy listening to them. Instead of Joe, the old crop

duster, one could have the Missionary Bush Pilot (n.d.) at one seat, Baron Pilot (n.d.) at another,

and Charlie from Airplane Academy (n.d.) sitting around the virtual table. Using YouTube

videos in this way allows the pilot viewer to purposely select and curate the stories and lessons

they learn, rather than consuming the random content often found in traditional hangar flying

around the FBO table.

These conclusions also align with previous research by Sellberg et al. (2021) and Fussell

and Thomas (2021), who offered evidence concerning the viability of YouTube videos as

educational resources for flight students and pilots in the areas of situational awareness and crew

resource management, concluding that video could positively enhance aviation education.

**Figure 11**

*Digital Hangar Flying Around the Table*
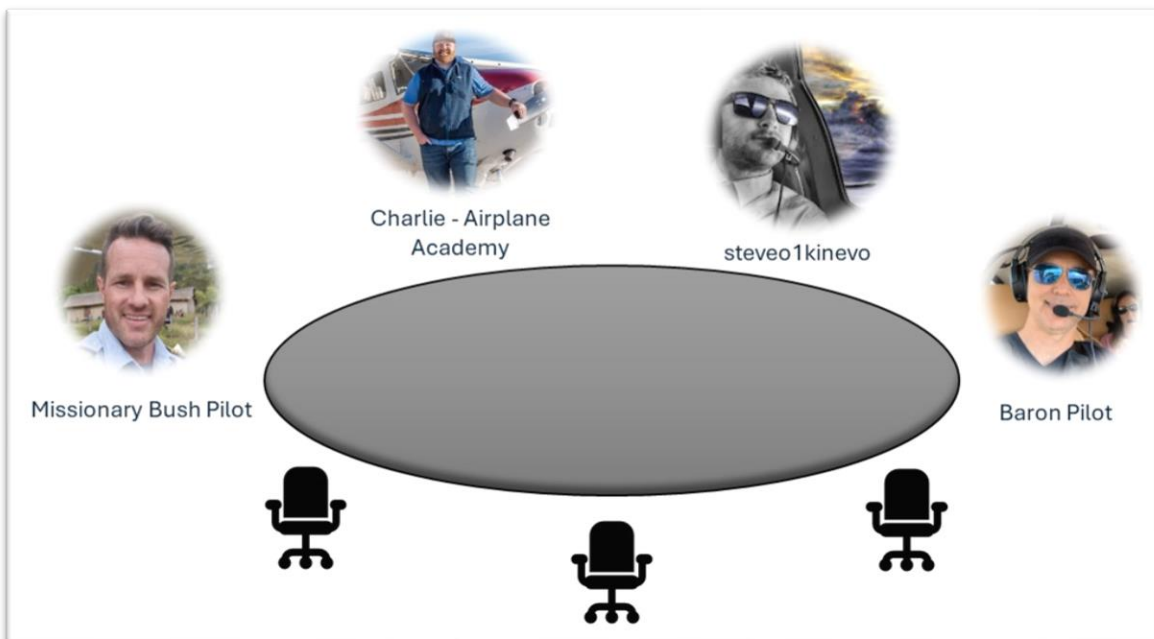


**The Evolution of Hangar Flying**

This research briefly examined the progression of hangar flying from a strictly oral

tradition to a digital storytelling act, which was a helpful exercise in understanding hangar

flying's origins, present use, and possible future. While the act of storytelling remains constant, the medium through which the stories are told has continued to evolve. Progressing from spoken orality to printed stories in magazines and then on to the technological worlds of television, radio, and the Internet, hangar flying continues to change along with new mediums. This research study has shown that hangar flying is found in multiple digital mediums. The findings suggest that pilots may use online sources like YouTube videos, podcasts, and social media for personal hangar flying rather than sitting around the airport table drinking coffee and swapping stories with other pilots. The presence and popularity of these online hangar flying sources may mean that traditional oral storytelling is a disappearing aviation pastime. As younger digital natives replace the older generation of pilots, airport lounges may soon be empty as more individual pilots trade face-to-face communication for virtual interactions.

### *From Overt to Covert*

YouTube makes storytelling easy to create and accessible to anyone with an Internet connection. While many hangar flying stories were overt examples of storytelling, the study found that some aviation channels present covert storytelling in the form of ride-alongs, in which the viewer is a passenger in the cockpit of an airplane while a pilot storyteller discusses some aviation-related topic. The viewer participates vicariously through the multiple cameras mounted to the aircraft and becomes a virtual participant in the video. Creators such as the Missionary Bush Pilot (n.d.), Baron Pilot (n.d.), FlywithKay (n.d.), and steveo1kinevo (n.d.) all invite the viewer to ride along with them in their airplanes as they fly to a destination, all while telling the viewers via cameras all about what they are doing. The viewer experiences the flight vicariously. This ride-along experience seems to be an evolution of hangar flying, not in the medium but in the type of storytelling. Given the presence of this type of ride-along YouTube channel, hangar

flying may go beyond the overt act of a person sitting and telling a story to another and evolve into this vicarious ride-along experience. In these videos, the story is not being recounted years later but is being created in almost real-time as the pilot flies along. It is also possible that this is not necessarily an evolution of traditional oral hangar flying but a divergence into an entirely new type that is also viable and useful for vicarious learning, with a different delivery method.

Interestingly, there were more hangar flying stories in the sample deemed overt acts of storytelling than covert ones. This result may have been due to the researcher's focus on selecting stories that explicitly told a story and contained a lesson to learn. While the covert, or ride-along-type stories, were the minority in the sample, it cannot be definitively said that these types of hangar flying are the minority outside of it. In truth, the researcher believes there may be a far larger cache of covert, ride-along-type stories available in digital storytelling on YouTube.

It is the researcher's position that YouTubers such as Missionary Bush Pilot (n.d.) and steveo1kinevo (n.d.) are practicing hangar flying by sharing their experiences as they are happening in the cockpit. This type of hangar flying differs from overt storytelling but still shares a pilot's experience with others. These stories are not prefaced with the phrase, *once upon a time*; instead, with ride-alongs, the story is happening right now. While overt storytelling may always have a place in an aviator's life, the future of hangar flying will see more covert content as creators use digital platforms to share their stories and experiences rather than tell them around the FBO table. Regardless of overtness, covertness, traditional or digital, the findings suggest there is room at the hangar flying table for all kinds of stories and storytellers.

## Reciprocation: The Heart of Hangar Flying

Many of the stories in the videos were staged re-tellings of events and not naturally occurring storytelling interactions. However, the serendipitous nature of storytelling was more

evident in the comments left below the videos, in which the viewers seemed to be triggered by the initial story to tell their own tales. This triggering randomly happened as the story told by the pilot seemingly resonated with the pilot viewer, resulting in a reciprocation of stories. This transactional communication is at the heart of hangar flying and is similar to what one would encounter in traditional face-to-face story-sharing. This serendipitous, naturally occurring reciprocation aligns with previous research by Myers (2022). He described this process as a triggering story that led listeners to tell their own story, ultimately creating transformation, in which both storyteller and listener derive meaning from the connection of their shared experiences. These reciprocations or communication transactions were seen in multiple comments, including the one shown in Figure 12, in which the triggering event was the storyteller's tale of scary moments he had while flying.

**Figure 12**

*Reciprocation Within the Comments–Example B*

This particular video from Airplane Academy (2021e) spawned multiple stories from the pilot viewers, and the comment section was essentially a textual hangar flying session as pilots shared stories, replied to one another, and shared new stories in reciprocation. Serendipitous hangar flying was also found in comments posted on the video, "Hard Story To Tell... I HOPE It Helps Someone" (Fly With The Guys, 2023), which told of the pilot who nearly killed himself and his children during an aborted landing. The pilot viewers offered immense support and sympathy for this storyteller with encouraging words and their similar tales:

> Total respect to you for sharing this, thank you. One we can all learn from. I had a similar experience in France a few weeks ago, I went around on an unfamiliar and high (in comparison to my home base) airfield with an up-sloping runway. I did get the flaps in but only just out climbed the trees at the end of the airfield. A very stressful experience. I can't even imagine your stress levels with your children as passengers. Again my total respect and admiration for sharing this. (daveherbert6663, 2023)

In these and other artifacts, the initial story triggered a more serendipitous, naturally occurring form of hangar flying in each YouTube video's comments sections. The comments section of each hangar flying video was a rich source of data, becoming a separate source of content to analyze for this study. One viewer could make a comment, which could spur many replies. The comments took on a life of their own, providing much that reinforced the themes found in the study.

## Implications

Reflecting on the implications of this study, the researcher concludes that the study's findings not only enrich the body of communication research but also provide strong support for the use of communication-centric tools in pilot education. The study underscores connections

between narrative, social learning, social cognitive, and cultivation theories, illuminating how storytelling influences learning, decision-making, and the development of a pilot's personal flying culture. Additionally, the study's digital content analysis method has proven valuable, providing rich data that would not have been accessible through other means. This section further discusses this research study's theoretical, methodological, and practical implications.

**Theoretical**

Keyton (2019) stated that the "best research is driven by theory, validates a theory, further explains a theory, challenges a theory, or aids in the creation of theory" (p. 6). The theoretical frameworks of social learning (Bandura, 1977), social cognitive (Bandura, 1986), narrative (Fisher, 1984), and cultivation theories (Gerbner, 1969) were used in this research, but only to provide a broader perspective on hangar flying's use as a vicarious learning tool and any potential role it may have in cultivating a general aviation pilot's personal flying culture. While evidence was found to infer the cultivation theory's influence, the role of social learning, social cognitive, and narrative theories was prominent.

General aviation pilots engage in hangar flying in various ways, gaining valuable insights from high-quality stories that significantly influence and enrich their understanding of the aviation world and their personal flying culture. Narrative theory is at work in the stories, social learning and social cognitive theory in the vicarious learning process the stories provide, and cultivation theory helps us understand how these stories shape the pilots' perceptions of flying and their behaviors. In other words, pilots engage in stories, learn from them, and choose how to react to that learning, and this process can determine the kind of pilot they become as well as influence the hangar flying content they will consume in the future.

***Social Learning and Social Cognitive Theories***

Bandura's social learning and social cognitive theories were guiding perspectives for this research. They were helpful in understanding the role of the communication process of storytelling in vicarious learning and behavioral change. This study posited a connection between narratives and social learning, which was apparent in the findings as pilot viewers indicated specific lessons learned and takeaways from the hangar flying stories. Additionally, pilot viewers indicated plans to alter future flying behaviors, such as choosing to carry lifejackets, backup radios, checking fuel caps, or reviewing checklists more closely, all aligning with social cognitive theory's tenet that individuals consciously select the actions they will take from their vicarious learning experience. These two theories showed how individuals gain knowledge from stories and then decide whether or not to use that knowledge to reproduce a behavior or action. The findings of this research support Bandura's (2006) assertion that storytelling was "an especially influential vehicle for effecting personal and social changes" (p. 54). Pilot viewers in multiple comments indicated that they had learned valuable lessons, and these lessons would save lives, prevent injuries, and make them safer, better pilots.

Both social learning and social cognitive theories were at work in this study. Social cognitive theory expanded Bandura's (1977) social learning theory beyond the social contexts of learning to emphasize the specific individual cognitive processes that human brains utilize to process the information gained from observing others' behaviors. When a pilot sits around the airport lounge listening to other pilots' stories, social learning occurs through the observation and consumption of those narratives. The pilot then decides whether or not they will retain that information or reproduce it in the future based on the outcome of the story they heard. If the story ended well, the pilot might likely imitate that behavior in the future. In contrast, if the

story's outcome is negative or punitive, the pilot is less likely to imitate that behavior. The social

cognitive theory takes this social learning a step further, saying that not only is the pilot's future

decision or behavior influenced by positive or negative reinforcement but also by how they

perceive their ability to perform the behavior they heard about (self-efficacy) and by their past

experiences and other stories they have heard while hangar flying (Bandura, 1986).

Both theories inform the current study, as social learning theory is the basis for how

hangar flying works as an informal vicarious learning tool, and social cognitive theory builds on

this concept to suggest how pilots will choose to act on the learning. Further, the theories suggest

that personal flying cultures and perspectives are influenced by the pilot's past experiences, past

hangar flying stories, and self-efficacy. As this self-efficacy grows, and as the pilot gains more

experiences, listens to more hangar flying stories, and increases their skills, their personal flying

culture also changes, as will their choices of what narratives to consume. In this study, viewers

observed and learned from the stories of pilots via YouTube videos, and indications of vicarious

or social learning and altered cognitive processes were found in the comments left for each

video.

**Social Learning in Negative Comments.** An unexpected and fascinating discovery was

found in comments that contained negative sentiments regarding the story's content or the

storyteller. An example of this is "some people really shouldn't be at the controls of an aircraft,

and this is another example of one of them. This person destroyed a perfectly good aircraft and

[was] very lucky not to kill anyone" (JeaneGenie, 2023). These negative comments also often

illustrated vicarious learning. Further, they address a criticism of social learning theory, which

maintains that individuals are likely to imitate any behavior they observe. However, social

cognitive theory addressed this shortcoming, saying that the observer still cognitively decides

how to react or learn from what is observed. Those who have argued against social learning theory might say that just because an individual observes someone robbing a bank does not necessarily mean they will mimic that behavior because they know it is wrong and will choose not to imitate it. So, when some commenters watch a hangar flying video and criticize or disagree with the story's lesson or point, this is an example of them exercising social cognitive theory as they think through what is right and wrong rather than simply choosing straight imitation, as social learning theory might suggest. The negative comments, although unkind at times, illustrated the viewers' autonomy in choosing what parts of the story's content they would learn from, what parts they would dismiss, and what parts they would choose to disagree with openly. Vicarious learning is still occurring, but these comments illustrate that the viewer retains control over how and if they will reproduce the behaviors observed in the story.

**Figure 6**

*Examples of Negative Comments*

**Extending the Definition of Observation.** Although social learning and social cognitive theories are rooted in social psychology, it must be noted that communication is the means by which social learning takes place. Both social learning theory and social cognitive theory were affirmed through this study concerning how vicarious learning takes place through observation. Although Bandura's (1977, 1986) theories focused on how individuals learn by visually observing others' actions, this research extended the meaning of *observation* to include any consumption of another's verbal or nonverbal communication. Thus, by listening to others share experiences or watching their actions, people learn and may choose to imitate what they hear or see. This means that pilot viewers can watch videos of other pilots telling hangar flying stories and observe and consume their experiences without any risk to themselves. Further, the research supports that vicarious learning can take place while listening to podcasts, audiobooks, or radio broadcasts, where there is no visual component. For example, one could learn to complete a puzzle by watching someone, but it is also possible to learn by simply listening to them describe the process. As these theories are applied to future research, it must be understood that social learning requires some form of observation, but observing others' stories and behaviors is not limited to only what one can see.

### Narrative Theory

Fisher's (1984) narrative theory was affirmed through this research and showed the story's power to impact the lives of those who engaged in the hangar flying videos. Fisher believed that people make decisions based on what he called "good reasons" that come from the narratives that individuals engage in (Fisher, 1984, p. 8). He further contended that storytelling must have narrative probability meaning it had to make sense. The story must also have narrative fidelity, which means the story must ring true and be accepted by those engaging with the story.

While these aspects warrant further study regarding hangar flying stories, the idea that narratives affect the cognitive processes of an individual in the way they choose future behaviors or make decisions was seen in the comments of the videos and connected to social cognitive theory as well. Those who engaged in the hangar flying stories indicated knowledge gained, lessons learned, and changes in perspectives on flying, as well as plans to alter future behaviors. This research further confirms the power of storytelling as a learning tool that can influence the minds of those who engage with it.

Interestingly, the most significant portion of the sample consisted of purpose-built storytelling, which aligns with narrative's rhetorical origins. Phelan and Rabinowitz (2012) concluded that narrative had its roots in rhetorical communication, where it was seen as "somebody telling somebody else on some occasion and for some purpose(s) that something happened" (p. 3). They posited that narrative was purpose-driven communication, being more an act than an object that seeks to accomplish some goal, such as teaching a lesson or changing behavior. Despite these rhetorical roots, Fisher (1984) saw the social constructivist side of the narrative, claiming that the goal of the narrative was to enable people to share understanding between them. This study affirms both claims, as much of the sample contained purpose-driven stories designed to teach lessons. However, the comments section below each YouTube video created a space to gain a shared understanding of the story's message amongst the viewers. There, the viewers directly commented to the storyteller and interacted with other viewers through replies and reciprocated stories of their own. In this way, the viewers used the original hangar flying story and the interactions with others to construct a new understanding of the narrative's purpose and lesson and gain knowledge to shape their individual flying cultures. As new research on hangar flying moves forward, one must remember that narratives can have dual

purposes, often to share a distinct message, provide a means for individuals to share common ground, and exchange ideas regarding the message.

### *Cultivation Theory*

Gerbner (1969) believed that repeated exposure to media could influence one's behavior and future decisions. He said that the messages one cultivates from the media can shape one's perspective. This study proposed that a pilot's flying culture could be influenced by the hangar flying stories they engaged in. While it was difficult to definitively determine that pilots were cultivating specific hangar flying stories to influence their flying cultures and perspectives, inferences could be made regarding the interests of the pilots who engaged in particular YouTube videos. One could argue that as pilot viewers consume hangar flying videos, they cultivate their own narrative or culture for flying. A pilot who views videos about or partakes in hangar flying regarding some aspect of flight safety is likely cultivating a culture of safety and thus strives to mitigate all risks in their flying lives. It could be inferred that if they engage in hangar flying regarding safety, this aspect is of great importance to them, and they wish to learn all they can to ensure their survival while piloting aircraft. Thus, this pilot may curate and cultivate a specific type of hangar flying content to continue maintaining or building a personal flying culture of safety.

This inference begs the question that if a pilot cultivated only hangar flying stories concerning risk-taking, dangerous stunts, or tall tales about flying, would this cultivation create a flying culture of risky behavior and disregard or lead to an indulgence in hazardous attitudes like macho-ness, invulnerability, or impulsivity? Given the other findings, this outcome seems possible and could imply that if more hangar flying content focused on risky behaviors, more pilots might indulge in them, thus resulting in a more dangerous general aviation industry. The

pilot featured in "Real Pilot Story: The Impossible Turn" shared that one of his biggest fears is

that those listening to his story would try and imitate his actions, which he felt was an unwise

course of action (Air Safety Institute, 2016b). Further research, possibly interviews with pilots,

could help determine the particular kind of flying culture one created by curating and cultivating

hangar flying content. Even so, this research strongly suggests that hangar flying presents

narratives in various forms that pilots curate and develop to form their unique flying cultures.

### *Going Forward*

The theories served as a guiding framework for this content analysis, helping to clarify

how general aviation pilots learn from each other's experiences. Further, the researcher believes

this study highlights the importance of these theoretical perspectives and their applications to

digital storytelling as a communication tool for vicarious learning. However, the theories did not

account for the online environment of this study, online video-based storytelling as a medium,

nor the communication phenomenon of hangar flying. The theoretical perspectives of social

learning, social cognitive, narrative, and cultivation must be developed more to make sense of

this new digital world of storytelling and the vicarious engagement in others' behaviors via

online platforms like YouTube. These theories must be extended to include applications to social

media and other digital mediums that may contain hangar flying content.

Additionally, theories could explore how individuals may learn only by hearing and not

seeing others' actions and behaviors. For example, is it possible to vicariously learn from a

podcast even though there is no behavior to see? This hangar flying study would argue that one

can observe and learn vicariously through listening to a story, even though there is nothing to

see.

Finally, other theoretical perspectives may gain new findings if applied to the digital

realm of hangar flying. In part, Bandura's social learning theory led to the development of the

entertainment-education theory, which explores how educational content can be communicated

through entertainment messages (Singhal & Rogers, 2002). Singhal and Rogers claimed there

was a natural connection between Bandura's concept of observational and vicarious learning and

how entertainment media seek to influence audience behaviors through narrative portrayals in

television, film, video games, and more. One could also apply motivated information

management theory (Afifi & Weiner, 2004) or uncertainty reduction theory (Berger & Calabrese,

1974) to explore how general aviation pilots seek out hangar flying stories to gain information to

reduce uncertainties related to flying. It is obvious that pilots are watching videos about

increasing flight safety, mitigating risks, and reducing pilot errors; therefore, these theoretical

perspectives would be valid to apply to hangar flying. These theoretical perspectives, and many

others not mentioned here, could provide a broader array of information regarding hangar flying

and further strengthen the body of communication and aviation research on this topic. The sky is

the limit, and there remains much to explore.

**Methodological**

Several possibilities were considered when designing the research plan for this study.

These possibilities existed because few scholarly studies have investigated the communication

phenomenon of hangar flying or its impact on learning within general aviation. Interviews and

ethnographies were considered viable approaches to studying hangar flying, but they were not

chosen due to time constraints. Ultimately, a qualitative digital content analysis was selected, as

this method was deemed more robust than the original phenomenological approach the

researcher had planned.

### *A Change in Approach*

Initially, the researcher had planned to interview multiple general aviation pilots to determine hangar flying's influence on their ongoing aviation education and personal flying culture. After counseling with wise scholars, the approach was changed to digital content analysis, as it presented an opportunity to conduct a more robust study in less time. The digital content analysis proved to be a more efficient way to gain baseline data regarding a pilot's vicarious learning through storytelling. It would likely have taken the researcher months or years to achieve the same amount of information through interviews with pilots or ethnographic studies of hangar flying at airports if it were even possible to do so. Using readily available online digital video stories via YouTube reduced the time needed for data collection and analysis. It also avoided obstacles that may have been encountered when using humans as research subjects. Further, it provided for a depth of research that may not have been achievable with interviews or ethnographies, as each artifact could be studied thoroughly, repeatedly, without the pressures of time, other individuals' schedules, or travel.

### *Qualitative Content Analysis*

The qualitative approach to this study was the best choice to accomplish the goals of this research, given the large amount of data to manage. The study analyzed 110 YouTube videos and their accompanying comments ranging from less than ten to thousands. Using a qualitative method allowed for the exploration and in-depth analysis of this data. While content analysis can be done quantitatively, a quantitative analysis would not have allowed for a focus on gaining understanding or interpreting meaning from the content. Hangar flying does not have a base of scholarly literature to draw upon; thus, the emergent design of this study allowed for the exploration of various themes, concepts, and other paths of information not originally planned.

Using a thematic content analysis approach was deemed a strong first step in researching the communication phenomenon of hangar flying. It will establish a foundation for further study on the topic. Although this study focused on digital hangar flying on YouTube, the method can be applied to other mediums where hangar flying may be found, such as podcasts, blogs, social media posts, or print.

Creswell (2013b) said content analysis was a flexible approach to qualitatively analyzing data, and the researcher agreed that this flexibility allowed for identifying and modifying themes subjectively. Examining the content using qualitative methods allowed the researcher to explore a theme deeply or shift focus when other themes presented themselves. This flexibility allowed for more understanding of hangar flying's role in vicarious learning and how the story's content may influence pilots. This open, flexible approach allowed themes to emerge authentically, explaining thematic patterns and indications of vicarious learning.

This approach allowed the researcher to make inferences regarding the primary goals of the digital hangar flying content and inferences regarding vicarious learning amongst the viewers of the content. A quantitative method would have demanded stricter parameters and definitive answers, which could not have been achieved easily from the content. The qualitative process provided explanations, support for theoretical perspectives, and thick descriptions of concepts through narrative excerpts from the hangar flying content and the viewer's comments. A quantitative process would have provided numbers and charts without the depth of explanation. Other qualitative methods, such as phenomenological interviews or ethnographic studies, would have provided rich data and remain viable approaches to hangar flying research. However, for the specific purpose and timing of this study, a qualitative content analysis was the best choice.

*YouTube As a Data Source*

YouTube provided vast content and was a convenient and efficient way to research this topic. Multiple videos were sampled to see if they matched the criteria of a hangar flying story, and 110 were selected. Although speculation, the researcher believes there may be thousands of aviation-related videos on YouTube, most likely, many containing hangar flying content. This amount means there are more hangar flying stories to analyze and more interesting things to discover. Sui et al. (2022) concluded that access to thousands of artifacts makes YouTube a valuable research tool, and the built-in search bar and suggested videos to watch next make finding videos simple and quick. The researcher concurs with this assessment and adds that the transcription tool that automatically provides a transcription of the video's content was a welcome feature and saved much time in data collection and analysis. A multitude of information is provided, including numbers of views, subscribers, and likes, which can be used for various studies, and viewer comments can be sorted from newest to oldest, a feature that can also aid the researcher when exploring the data. As mentioned, the comments can be a stand-alone data source providing indications of sentiment, discourse around a topic, or even a particular group's culture (Sui et al., 2022). In this study, the comments indicated vicarious learning, social support, and sentiment regarding a hangar flying story and its storyteller. In summary, YouTube videos provided excellent samples for this qualitative thematic content analysis, which other researchers could replicate, although the results may vary given the subjective nature of interpretation.

*The Role of the Researcher*

The researcher's role in this study provided a nuanced exploration of the sample. The researcher's experience as a general aviation pilot and educator allowed for a more efficient

recognition of aviation-related themes and a deeper understanding of the various topics of the

hangar flying stories. Aviation terms did not have to be explained to the researcher, nor did any

slang or jargon used in the stories. The researcher could curate and identify the videos that met

the criteria outlined in the study and discard those that did not.

Although the qualitative method had several advantages for this study, the researcher's

subjective interpretation of the data is a disadvantage. Creswell and Creswell (2018) mentioned

that qualitative content analysis is influenced by the researcher's experiences, beliefs, and biases.

Although the researcher made every effort to remain unbiased throughout the study, he was not

always successful, and it must be noted that this bias is a drawback of the qualitative approach.

**Practical**

This research has added to previous work that supports the use of the communication act

of storytelling as a teaching device (Austin et al., 2016; Gallo, 2019; Humpherys & Babb, 2020;

Landrum et al., 2019; Sharf et al., 2011; Zazkis & Liljedahl, 2009). It also furthers research that

digital storytelling via online platforms like YouTube has enabled new ways of sharing

experiences and teaching lessons that transcend the traditional one-to-one storytelling act to

create a one-to-many interaction (Chan & Sage, 2019; Choi, 2018). Regarding this study,

learning new skills or flight safety practices via YouTube could significantly benefit general

aviation pilots as an informal supplement to their formal flight training. Stories like those in the

study could augment the learning experience of pilots, prevent future accidents, and build a

culture of safety in the aviation community.

*Hangar Flying is a Viable Informal Flight Training Tool*

With more than 1,000 accidents per year, many of which are fatal, general aviation's

safety record is far worse than its commercial airline brethren (National Transportation Safety

Board, 2021; Pilot Institute, 2023). More than half of these accidents are caused by pilot error, often due to inadequate formal training or lack of experience in real-life situations (Pilot Institute, 2023). The necessity to reduce pilot errors, injuries, and fatalities has led some scholars to suggest that in addition to formal training, more informal methods should be explored as ways to increase general aviation safety (Cohn, 1994; Chui et al., 2021; Harnagel, 2021; Krog, 2022). Although they did not call it *hangar flying,* many of these scholars suggested that learning from pilots' experiences and stories could be a valuable informal method to supplement formal flight training and thus increase general aviation safety.

This study's findings reinforce those scholars' conclusions and strongly support the idea that hangar flying is a viable informal supplement to a pilot's formal flight education. Moreover, this storytelling communication practice could decrease accidents due to pilot error and increase general aviation flight safety. All those in general aviation, from student pilots to instructors to industry leaders, should take note of these findings as they provide a user-friendly tool for preventing injury and death. The Federal Aviation Administration (2019) touts safety as its priority. It could embrace hangar flying as an official supplemental educational tool for general aviation, promote its use, and support those who would create storytelling content in various modalities for the betterment of all aviators.

Content creators, both individuals and organizations, may also want to pay attention to the viability of digital hangar flying content as a learning tool. Given that some of the video stories in the sample had hundreds of thousands of views, with a few over one million, creators may want to capitalize on the popularity of hangar flying content and produce more. More content from organizations like the Air Safety Institute (n.d.-a) focused on sharing pilot stories to increase safety would help general aviation pilots improve this area. More content from others

like Taking Off (n.d.-b), which shares serious and light-hearted stories of pilots' experiences, would also be welcome as educational material can be more effective if blended with entertainment in YouTube videos (Choi, 2018).

Hangar flying content could also be used as the basis for formal scenario-based training for general aviation pilots. Pilots could use various stories found online to create missions or scenarios to practice during their next flight or as the basis for a flight review with an instructor. For example, if a pilot watched the story, "Soft Field at Night!! Pilot Stories" (Taking Off, 2023h), they could recreate the conditions of the story on an actual flight and play out the scenario, avoiding the mistakes made, and practice the correct procedures. Hangar flying goes beyond the textbooks and could resolve deficiencies general aviation pilots may have in their formal flight training. There is a lot of information to learn when studying to become a private pilot, and instructors may fall short in teaching everything there is to know about aviation. For example, in the researcher's flight training, he was never instructed on the procedures for leaning the fuel mixture or recovering from a spin, which are essential information. These were deficiencies that he was unaware of until a hangar flying session with a fellow pilot enlightened him. Please note the researcher is not suggesting that YouTube videos or hangar flying in any form could replace quality flight training with a certificated instructor and should not be mistaken for such. The researcher is merely suggesting that a practical implication of this research is that hangar flying, digital or otherwise, can be an additional form of supplemental education for general aviation pilots.

### Pilots Can Create Their Own Free Online Education

Another benefit of hangar flying on YouTube is that the education is free and customizable. Given that a private pilot certificate costs $10,000-$20,000, gaining some

knowledge for free on YouTube could be immensely helpful to the general aviation pilot (Flying,

2023). While there are no degrees or certifications offered for study on YouTube, pilots can add

to their knowledge base without limit, helping them become safer, more proficient pilots by

vicariously learning from a plethora of other pilot storytellers and content creators. However, it

must be noted that a pilot must be judicious in their content curation, as some stories may offer

incorrect or outdated information or may not offer any educational value at all. Some content

may encourage reckless or hazardous flying behaviors or provide poor advice that could lead to

catastrophe. Given the number of general aviation accidents caused by pilot error each year and

the ease of digital content access, learning safer practices via online hangar flying stories could

benefit the entire aviation community. Digital hangar flying provides a path for life-long

vicarious learning for general aviation pilots, with benefits that far outweigh any possible costs.

### *Hangar Flying as a Model for Other Disciplines*

The usefulness and benefits of storytelling as an educational tool have been shown in

multiple fields in traditional and digital modalities. Thus, the communication practice could be as

effective for learning if implemented in other disciplines. Previous research from Selby and

Thompson (2018) concluded that the medical field could learn much from the informal practice

of hangar flying. They furthered that if medical professionals could learn to share their mistakes

and lessons learned with each other as aviators do, then this practice would greatly benefit the

medical field and the patients they help. However, they also concluded that doctors are often

driven by their ego and are unwilling to admit mistakes for fear of legal action, making it

challenging for hangar flying-type communication to thrive. Other fields like law, engineering,

and criminal justice could develop hangar flying storytelling activities, although these, like

medicine, may be driven by competition and resist the concept. Despite this, storytelling could

bring clarity, community, and collaboration to many fields, ultimately making them better able to contribute to humanity.

## Delimitations and Limitations

This study's findings were characterized by researcher-imposed delimitations and weaknesses in the research design or limitations that impacted the conclusions and outcomes of the study. This section details this research's various delimitations and limitations and offers explanations.

### Delimitations

The delimitations of this research were a set of parameters or boundaries the author selected to create a more manageable and focused study. The author selected some elements to include in the study while excluding others. Specifically, in this section, delimitations in method, sample, research questions, and theories are explained.

#### *Method*

This qualitative study used a digital thematic content analysis to examine a sample of 110 YouTube videos that contained hangar flying content. The selection of a digital content analysis was a methodological delimitation, excluding other approaches like phenomenology or ethnography. While the content analysis approach can provide rich data, it cannot capture the profound personal experiences of individuals like a phenomenological approach can or observe the behaviors of a group in real-time like ethnography. The digital content analysis was chosen to create initial baseline research on hangar flying and its efficiency in data collection and analysis.

#### *Sample & Population*

Several factors also delimited the study's sample. First, the sample focused only on online digital videos found on YouTube, thus excluding other online artifacts such as blogs,

articles, podcasts, social media, and other online video-sharing platforms. As this study was an initial exploration of digital hangar flying, only one platform was selected to establish some foundational research on the topic. YouTube was chosen as the data source due to its popularity and vast amount of video stories to choose from. YouTube has over 2.7 billion users, providing thousands of hours of video to sample (Shewale, 2023). These factors further delimited the sample: Each qualified video had to depict a general aviation pilot telling a story that taught a lesson or shared some experience, have at least 1,000 views and 1,000 subscribers, and have user comments posted below the video.

The study focused on hangar flying amongst the specific population of general aviation pilots; thus, the sample did not include story content from other ranks of pilots, including current student pilots, flight instructors, or professional airline pilots. Further, content regarding airline accidents, formal accident analyses, or professional airline operations was also excluded as the focus was general aviation.

### *Research Questions and Theories*

The study was also delimited by the study's research questions, which narrowed the focus to investigating the primary themes of the video content, the primary themes and general responses found in the comments of each video, inferences made regarding vicarious learning, and the primary purpose of each story. Along with these elements were delimitations imposed by the researcher's choice of guiding theoretical perspectives. A focus on the role of storytelling in enabling vicarious learning was guided by social learning theory, social cognitive theory, and narrative theory, while the exploration of the influence of hangar flying content on pilots' learning and flying behaviors was guided by cultivation theory. These frameworks were helpful to the scope of this study but excluded other possible perspectives on hangar flying that may be

beneficial to communication research, including entertainment education, uncertainty reduction, and social support theories.

## Limitations

Several limitations were identified as this research progressed. These areas of the study created questions that could not be answered within the boundaries of this specific research. These could be called weaknesses of the study or simply things that could not be known.

### *Not Inclusive of All Types of General Aviation Pilots*

Although not intentional, the researcher only selected stories that focused on general aviation pilots who flew engine-driven airplanes and neglected to include other general aviation aircraft pilots who fly aircraft such as helicopters, gliders, or light jets. While hangar flying content containing these other general aviation pilots did not organically appear during the initial searches on YouTube, the researcher admits that it was also not intentionally searched for. This oversight may be partly due to the researcher's experience as a private pilot certificated to fly only single-engine aircraft, and this unconscious bias may have been a limitation here. In qualitative studies, the researcher serves as the primary research instrument; thus, the perspectives provided are inherently subjective (Creswell & Creswell, 2018). Although the researcher attempted to avoid bias, this may have occurred during the selection of the specific hangar content included in the sample.

### *Use of Personal YouTube Account*

Another limitation was the researcher's use of his personal YouTube account. It is possible that the videos in the sample were curated somewhat by YouTube's algorithms based on the researcher's previous searches. The researcher had previously searched for information about purchasing his first aircraft, which could have triggered the YouTube platform to provide videos

containing that content when a new search was conducted for hangar flying stories. The researcher concludes that he should have created a new or incognito account for this research study, which may have prevented algorithm bias (Sui et al., 2022). While it is impossible to conclude that these factors ultimately influenced the content selected for the study, it is important to consider the possibility when conducting any similar future research.

### *Researcher Inferences*

Another limitation was that the researcher could only make inferences regarding vicarious learning and the motivation or purpose of the storyteller. There was a limit to the information that could be gleaned from the story's comments and content, leading to subjective interpretation and inference. Without interviewing the viewers and content creators, one cannot definitively determine the story's purpose nor if vicarious learning or changes in pilot behavior took place. However, there were strong indications of each. Further, it was often difficult to conclusively determine if the commenters were pilots or, more specifically, if they were general aviation pilots. Some identified themselves as such or said they were airline pilots or fighter pilots or admitted they were not pilots at all. However, most did not, leading the researcher to further infer from the use of terms and language in their comments that they were pilots with some knowledge of the topic.

## Recommendations for Future Research

During this study, the author identified several directions for further research concerning the communication phenomenon of hangar flying. The delimitations and limitations noted above provide many opportunities for future studies, as did other unanswered questions that emerged during the study. This section will offer several suggestions to future researchers who wish to continue scholarly work on hangar flying.

**Future Research Approaches**

While this research study focused on digital video artifacts, exploring other avenues of analysis may yield a deeper understanding of hangar flying. Other methods may yield new and important findings that would further communication research, validate this study, and benefit aviators as a tool for vicarious learning.

*Conduct Interviews with Pilots*

One should conduct qualitative, semi-structured interviews with general aviation pilots to collect data regarding their perceptions of the communication practice of hangar flying and its influence on their personal flying cultures. While this study has provided data on the sources of digital hangar flying for general aviation pilots, the researcher believes that interviews with general aviation pilots may provide valuable additional findings. There is still much that is unknown about how pilots gain education beyond their formal flight training. Why do pilots hangar fly? What draws them to an aviation story? Are pilots still engaging in traditional hangar flying? Are they combining traditional with digital? What sources of digital hangar flying are they using? Why those sources? Are they utilizing multiple forms of hangar flying? These are just a few questions that in-depth interviews could answer, giving a researcher a more robust understanding of hangar flying. Interviews with general aviation pilots would also be a valuable secondary source of data to triangulate and validate this author's research findings, bolstering the trustworthiness and credibility of the original study.

*Conduct a Specific Content Analysis*

This study has provided a thematic content analysis of one online form of digital hangar flying. This study could be taken to the next stage of discovery by selecting a group of general aviation pilots to interview or survey concerning the specific YouTube channels they follow for

hangar flying-type content. A more specific qualitative content analysis could then be conducted on those channels to determine emergent themes. There is also room for quantitative or mixed methods study on this subject. Once an understanding of hangar flying content is established, one could quantify its sources from interviews or surveys. Additionally, hangar flying content on YouTube could be quantified and ranked based on the number of views, comments, subscribers, and likes to determine the popularity or create a data-driven model that outlines how pilots choose hangar flying content based on these factors.

### *Conduct an Ethnography*

Myers (2022) conducted an ethnographical study of flight nurses on an air medical team to explore their use of storytelling for vicarious learning. Myers observed the stories serendipitously told among the flight crews and then interviewed the nurses concerning the value of storytelling in their daily routines. A similar study could be reproduced with general aviation pilots by visiting airports, fly-ins, or other aviation gatherings and simply embedding themselves as a participant observer. Then, after gathering some observational data, personal interviews could be conducted with individuals to determine how storytelling adds to their aviation culture, informal education, or sense of community. One may discover that traditional hangar flying no longer exists, has been replaced by digital forms, or has changed in other ways. Immersion in the general aviation culture would be challenging depending on the researcher's location and proximity to possible observational opportunities. However, the depth and richness of data gathered may be worth it.

### *Use a Narrative Analysis Approach*

The final suggestion for future research concerning the method is to analyze further the content of the YouTube hangar flying stories presented in this sample or additional samples

using a narrative analysis approach. Based on the work of Coffey and Atkinson (1996) and

Labov and Waletzky (1997), narrative analysis investigates the structure of a story and how the

parts are arranged to achieve a purpose. Studying the structure of the stories in the YouTube

videos may also provide more support for how and why vicarious learning is enabled through

storytelling. Through this process, the researcher might discover the elements that make an

excellent hangar flying story and how this may influence learning connections made by listeners

or viewers. Is it the length, the use of humor, the presence of truth and fidelity, or the authenticity

of the storyteller? How is the story crafted? How does the storyteller gain attention, create

suspense, and end with impact? These questions are worth asking and would add to

understanding hangar flying as a communication tool for imparting knowledge and experience.

**Other Suggestions for Future Research**

Beyond different methodological approaches to the topic, future researchers may wish to

explore aspects of the current study in more depth. The current study left many roads untraveled

and questions unanswered, which remain worthy of research. The following are various paths

that one could take to explore hangar flying as a communication phenomenon.

*Investigate Connections Between Parasocial Relationships and Vicarious Learning*

This study's findings introduced the concept of a parasocial relationship between the

storyteller and the viewer of the hangar flying video. Exploring this further was beyond the

present study's scope but is a valuable direction for further research. The researcher noted that

individuals expressed an intimacy or familiarity with the content creators despite the lack of

evidence that they had any authentic interaction outside the virtual space. Some comments

suggested that viewers chose to learn from the storytellers because they trust them, even though

they have only interacted with them virtually. Many commenters indicated that they had

followed the storyteller for years, consuming their content and building this perception of trust. As the parasocial relationship deepens, it may accelerate the desire to learn vicariously from a specific storyteller. The more one trusts, the more one wants to learn from a particular creator and thus may be influenced by their stories and experiences. How much of the learning is influenced by the viewer's positive perception of the creator, and how much by the content itself? If the pilot viewer feels as if they know, like, and trust the storyteller, is their vicarious learning experience more rich or meaningful? More research is needed to discover if these parasocial relationships accelerate vicarious learning or otherwise affect it. This concept of trust equaling more content consumption may also be important for content creators as they consider factors that may help them build a following.

It may also be possible that viewers perceive the content creators as a kind of virtual flying mentor or guru whom they seek out for answers when they face a challenge in aviation. Many viewers commented they had been inspired to learn to fly from a particular creator, had learned from them for years, or had used many of the storyteller's experiences to become a better pilot. Exploring this specific kind of parasocial relationship may also be valuable in the continuation of hangar flying research. One could look beyond YouTube to social media groups where hangar flying takes place to see if these parasocial mentorship-type relationships exist with particular Facebook or Instagram personalities.

There were multiple examples of parasocial interactions within the hangar flying content, but more research is needed to determine why and how they occur. More importantly, what are the effects of these relationships on vicarious learning, and how do they impact a pilot's personal flying culture and the type of hangar flying content they consume?

There are many questions to explore: Are creators telling and making stories to build

their audience and create these relationships to gain more of a following? Do the storytellers

create these videos to market themselves and build these viewer relationships where they are

liked and trusted for future purposes of selling something? Does the level of perceived

relationship or trust influence the vicarious learning of the viewer? Is there a connection between

the length of time viewers have followed a storyteller and their trust level or willingness to learn

from them? Are there any downsides to these parasocial relationships regarding how or what a

pilot learns because of them? Could a viewer have such an intensely perceived parasocial

relationship that they would unquestioningly trust anything the storyteller suggests, even if it is

incorrect or dangerous?

Future research could explore this concept by applying Horton and Wohl's (1956)

parasocial interaction theory to the digital realm of hangar flying, as this exploration would

further add to the body of communication research on the topics.

### *Explore a Connection Between Storyteller Credibility and Vicarious Learning*

On a related note, the researcher discovered that the perceived identity, credentials, and

honesty of the storyteller influenced some commenters' sentiments toward the story and its

creator. In some cases, these perceptions seem to negatively affect the potential for vicarious

learning. Some viewers asked about how many flight hours storytellers had or whether they were

qualified to fly in certain conditions or questioned their ability to fly altogether. For example,

commenters harshly criticized a pilot for being inexperienced and unsafe (Taking Off, 2023d),

questioned the adequacy of another's training (Taking Off, 2022g), and denounced one's

decision to fly a straight-in approach at an uncontrolled airport (FlywithKay, 2023a). Although

comments like these were a minority amongst a majority of positive sentiments, it was

interesting that the lack of perceived storyteller credibility seemed to negatively affect the commenter's willingness to learn anything from the stories. While this reaction is worthy of a closer look, the researcher offers the insight that in most stories, the credentials or qualifications of the storyteller were not cited as significant by the viewers. In fact, to the researcher, some stories were so important or resonating that the qualifications or identity of the storyteller were irrelevant. The in-flight fire story (Air Safety Institute, 2011b) was so impactful and terrifying that it would have made a lasting learning impact on the researcher, no matter who told the story. That story is so foundational to survival that the storyteller's credentials are not important, nor is the level of perceived relationship with them. Therefore, what factors make a storyteller a credible source for vicarious learning? Do other viewers agree with the researcher that a story can be so powerful and impactful that the storyteller is inconsequential?

### *Exploring An Omnidirectional Communication Model for Hangar Flying*

This study briefly discussed the evolution of hangar flying from traditional face-to-face storytelling in the airplane hangar to the new world of digital videos that share pilots' experiences with the masses. Even though there are new storytelling mediums, hangar flying still exists in traditional oral and print modalities and other online forms like podcasts and social media posts. The researcher attests that his informal aviation knowledge comes from many online and offline sources. Building upon this knowledge, the researcher posits that pilots may be creating their own omnidirectional communication model (van Ruler, 2018) for their continuing aviation education by curating hangar flying stories from various face-to-face and digital sources. Omnidirectional communication goes beyond simple interpersonal interaction to include the relationship between individuals. The process is constantly moving, with senders and receivers changing at will. Multiple factors are at play, and hangar flying may be seen as

omnidirectional, considering the numerous mediums it uses and the transactional nature of the storytelling communication.

In other words, it is possible that pilots may learn about aviation from a *constellation* of sources, in which, like stars, various types of hangar flying connect to form a pilot's flight education. A pilot may enroll in formal flight training with an instructor and simultaneously curate many other informal educational sources. A pilot may learn from watching YouTube videos from the Air Safety Institute (n.d.-a), listening to podcasts from *Flying Magazine's* "I Learned About Flying from That!" (Godlewski, 2022), reading *AOPA Pilot* magazine's printed column, "Never Again" (AOPA, 2008), and interacting with social media stories as a member of the Facebook Group, Airplanes and Coffee (n.d.). They may also choose more direct human contact by attending Saturday morning hangar flying sessions at the airport. The point is that learning is no longer limited to just one-on-one with an instructor, and hangar flying is no longer limited to face-to-face interactions with other pilots at the airport. Learning and hangar flying occur in various directions and from multiple sources, especially when vicarious learning is an option. More investigation is required to determine how a general aviation pilot creates this omnidirectional model, which sources they use most, and how these multiple sources influence their flying culture.

### *Explore Other Populations of Pilots*

Further research could extend this study's boundaries to include other pilot levels and pilots who fly other aircraft, giving the researcher a larger sample to analyze. The next study could include student pilots, airline pilots, helicopter pilots, glider pilots, and those who fly gyrocopters, ultralights, and experimental aircraft. Since this study was delimited to focus on general aviation pilots and unwittingly limited by the researcher to include only those who flew

powered non-rotary aircraft, including other types of pilots would strengthen the sample of stories and the overall findings. Future studies could also focus on one specific kind of pilot to give a more nuanced understanding of hangar flying for a particular aviator category.

In addition to other types of pilots, a possible direction would be to focus on certificated flight instructors and their potential use of stories to educate student pilots. Cross and Kiernan (2022) found that flight instructors learn from informal storytelling with each other, a practice that they found beneficial. Interviews with both instructors and students could reveal the impact storytelling may have on formal flight training or how flight instructors may use stories to share their teaching experiences with other instructors. Flight instructors are pilots, too, and most likely have valuable experiences to share with others.

### *Explore Commenter Demographics Related to Vicarious Learning*

Exploring the unknowns about the commenters might also be valuable in providing more in-depth, nuanced information regarding the effects of hangar flying on vicarious learning. It was nearly impossible to determine the gender, age, or piloting qualifications of the viewers, and more so if these factors affected their perceptions of the story or storyteller. Most commenters did not openly give their gender or age, and while both could be implied by their usernames or in their comments, this inference may not be accurate. Thus, future research could explore the differing perceptions of hangar flying stories amongst various ages, genders, and pilot experience levels. Surveying groups of commenters on a selection of videos to determine demographic information could be a first step in research, followed by interviews to gain data related to the influence of the story on vicarious learning and personal flying culture. Research could show further nuances concerning the role hangar flying plays in individual pilot lives, whether they are young, old, male, female, private pilots, or commercially rated.

### Explore Generational Differences Regarding Hangar Flying

Hangar flying is as old as flight itself, and as this research has discussed, it has evolved significantly since its beginnings, incorporating technology while still retaining its essence. Have pilots adapted to the evolution, or are some still clinging to the past? A related suggestion for further research regarding pilots' age may be to examine the generational differences in the use of hangar flying and the mediums used for it. For example, Generation Z has grown up with technology and may be more prone to engage in hangar flying online than face-to-face or more apt to watch videos rather than read a blog. On the other hand, Generation X may use magazines or face-to-face encounters as their primary choices for hangar flying. As Generation X fades and new generations rise to create content, could the traditional oral hangar flying at the airport cease to exist? Has it already begun to change or fade away? Exploring the use of hangar flying across various generations of pilots could yield valuable data regarding the history and future of the communication practice for aviators, its value as a learning and community bonding tool, and provide data for content creators who will ultimately decide its future direction.

### Are Pilots Focused on Building a Culture of Safety?

This study explored the role of hangar flying as a tool for general aviation pilots' vicarious learning and how that learning could influence their personal flying culture, flying decisions, and future aviation-related behaviors. There were indications from the comments and the story's content that much of hangar flying is focused on building a culture of safety in general aviation. Exploring whether this focus is true and how these stories might impact the entire general aviation community might be valuable information to research. Using Carey's (1975) work on ritual communication and Fraser's (2020) insights regarding storytelling and

culture, one may be able to explore how hangar flying is central to general aviation and may be essential in creating a culture of safety among the community of pilots.

### *Investigate Hangar Flying's Role in Building Organizational Culture in General Aviation*

An additional direction regarding culture is to examine the role of storytelling in building the organizational culture of flying clubs, social media groups, and other gatherings of aviators. Organizational culture focuses on how organizational members construct culture via shared meanings, values, and artifacts, which help them make sense of their world (Keyton, 2017). An original approach to this concept was the work of Pacanowsky and O'Donnell-Trujillo (1983), who viewed organizational culture through the lens of performance, seeing that organizational culture was demonstrated through various performances, including storytelling and rituals. Hoelscher et al. (2016) used these concepts, observations, and interviews in farmers' markets to learn more about how that culture functions differently than mainstream grocery stores. Aligning with this research study, Myers (2022) alluded to the use of storytelling as a learning tool that could transform, share meaning, and influence organizational culture within aviation medical teams. A future hangar flying researcher could apply these concepts to understand how culture is formed and maintained in flying clubs or other aviation organizations and groups through stories and shared experiences.

### *Explore Digital Hangar Flying With Virtual Reality and Simulations*

A suggestion for future research is to build from this study by exploring the incorporation of hangar flying with advanced technologies like virtual reality (VR) or flight simulators. What if real pilot stories were used to create virtual reality simulations for students or other pilots to learn safety procedures or how to handle various emergencies? These scenarios could be played out safely within a flight simulator environment or virtual reality system without needing an aircraft,

fuel, or an instructor. For example, Microsoft Flight Simulator software offers flight simulations

that could allow a pilot to re-create the storied missions of the Missionary Bush Pilot (n.d.) in

Papua New Guinea, complete with aircraft, routes, and scenery right on a home computer (MSFS

Addons, 2023).

Additionally, one can combine the simulator game with a VR headset like a Meta Quest 3

or an Oculus and achieve an immersive experience as if sitting in the cockpit of a real airplane

during flight. Combining advanced technology like VR and gamified computer flight simulators

with hangar flying stories could not only widen the educational opportunities for aspiring pilots

but may be more affordable than renting a fuel-guzzling airplane or a high-priced full-motion

simulator to practice maneuvers in. Guthridge and Clinton-Lisell (2023) studied the efficacy of

using virtual reality for flight training. They found that many pilots responded positively to the

technology, although the pilots said it could not fully replace hands-on flight training at the

controls of a real airplane.

If these simulations were created from the hangar flying stories of seasoned aviators, they

could be nearly endless. They would be valuable to industry leaders responsible for finding new

ways to decrease pilot errors, create better training, and make aviation safer. Future research

could explore the viability of using stories as a source for scenario-based VR flight training, both

in a formal and informal setting. Can pilots learn flying skills using these technologies? Could

one learn vicariously by watching others fly the simulations?

### *Explore Digital Hangar Flying in Social Media Groups*

Another avenue of digital hangar flying to explore would be the various social media

platforms where these interactions could occur. The most prominent social media platform,

Facebook, has multiple aviation-themed groups that one can join to discuss everything about

flying. One group cited in this research, Airplanes and Coffee (n.d.), is well-known among

aviators and has over 163,000 members. In this group and others like it, individuals share stories,

ask for advice, and occasionally complain about some regulation. Other pilots reply with their

own tales, adventures, and words of encouragement. Usually, many pilots will respond to a

single post, creating a very sizable digital hangar flying session. Future research could analyze

one or many groups in the same way this study was conducted, looking for dominant content

themes and indications of vicarious learning. One could also study the interactions for

reciprocation or quantify the number of replies a single story post receives to determine the most

popular group for hangar flying. One could also conduct digital ethnographic research and

embed oneself in a group as a participant observer interacting and recording responses to hang

flying-type posts. The vastness of Facebook's platform, with nearly 3 billion users (Shepherd,

2023), allows for multiple opportunities for further research regarding hangar flying. Other social

media platforms, like TikTok and Instagram, may also be avenues to explore.

### *Investigate the Codification of Serendipity*

While most storytelling is a serendipitous communication encounter and occurs randomly

between pilots, it seems that some organizations like the Air Safety Institute (n.d.-b) are

attempting to codify hangar flying through staged retellings of pilot stories to present a packaged

piece of YouTube content to the world. Future researchers could explore this codification and

find out more that would inform hangar flying scholarship.

In this study's sample, the overt video stories often had defined introductions and

conclusions and added music, dramatizations, animations, and photographs. The medium of

video makes this packaging of a story possible. Many of these things would not be available to

the traditional hangar flying pilot as most do not have video simulations of their flights playing

behind them while they drink coffee and tell a story. As capturing serendipitous events is often impossible, it is understandable that organizations and users would attempt to share the message of an impactful story in the next best way possible. This codification of storytelling is not without value, just as a photograph is still valuable in capturing a memory. The pilot's story is still told to an audience, and as the study illustrated, vicarious learning still can occur. In fact, it may be better than a naturally occurring story event, as one can rewind and replay parts of the story via YouTube, allowing the viewer to clarify details and gain more in-depth knowledge.

Codifying storytelling is not a new phenomenon, as many organizations do so as a marketing tool in building their brand image with consumers (Júnior et al., 2023). These scholars also posited that packaging a story in specific ways led to better engagement and identification with a brand, which resulted in positive outcomes for the organization.

In future research, one could conduct surveys or interviews with pilots, viewers, and creators to discover more about the effects of this packaging or codifying of storytelling content. Future research could ask, why are these creators choosing to package the content this way? Does codifying make the story more impactful? Does codification affect vicarious learning? Is there a method or template YouTube creators follow to codify a story? How does a codified story with animations and sound effects compare to a naturally occurring story? Discovering more about this codification will provide more data on digital hangar flying and how codifying stories may affect general aviation pilots.

### Further Research on Reciprocity

Reciprocation was found in nearly every video's comment section. Pilot commenters were likely to reciprocate with stories of similar or related experiences that often contained additional lessons beyond the original story. Interestingly, in some of the hangar flying stories in

the sample, other pilot viewers would join in the conversation by replying to another commenter with their own story, lessons learned, and mistakes made. While this practice was common, the researcher could not determine why it happened. What makes one person feel the need to reply to a storyteller with another story? Is it a bonding response? Is it simply part of the ritual communication of storytelling? Is this an expected part of hangar flying? Does this build community or culture? What could a lack of reciprocity in a hangar flying session indicate? Ultimately, this phenomenon of reciprocal storytelling is at the heart of this study, which is that pilots can vicariously learn from one another through the stories and experiences they share. This mutual exchange of learning may help them improve their skills, avoid future mistakes, and provide a means for relationship and community building. Observing hangar flying as it naturally occurs and interviewing pilots may help yield some answers and shed light on this phenomenon.

## Summary of the Chapter

Chapter 5 summarized the findings from the four research questions that guided the study. Next, the discussion section focused on several findings in more detail, expounding upon them. Then, the theoretical, methodological, and practical implications of this research were explored, followed by the delimitations and limitations of the study. Finally, several recommendations for future research were offered to encourage others to continue scholarly work on the fascinating subjects of hangar flying and vicarious learning.

## Summary of the Study

This research explored hangar flying as a communication practice through a thematic content analysis of online hangar flying videos and the responses made by pilot viewers. The study filled gaps in communication and aviation scholarship concerning the connection between hangar flying stories, their use as potential vicarious learning tools, and their role in influencing

general aviation pilots' personal flying cultures. Findings revealed that much of the digital

hangar flying content focused on educating pilots by sharing experiences focused on decreasing

pilot error and increasing flight safety. Many stories shared emergencies, dangerous situations, or

near-fatal mistakes made by the storyteller to help other pilots avoid similar challenges and

become safer, better pilots. In addition to the primary themes of danger and increasing safety,

other themes emerged, including the importance of lifelong learning for pilots, general aviation's

positive impacts, and the unique opportunities that exist for aviators. The viewer comments

revealed indications of vicarious learning and plans to alter future flying behaviors based on the

story's content. Pilot viewers often mentioned the value of the videos and the lessons learned as

both educational and lifesaving.

The study supports vicariously learning from others' experiences, mistakes, and

successes as a far safer and more efficient way to gain aviation knowledge than trial and error

while in flight. This research further supports Bandura's social learning and social cognitive

theories by providing strong indications that pilots can learn observationally through the stories

and experiences of other pilots and thus can be "spared needless errors" in their future behaviors

(Bandura, 1977, p. 22). The study found strong connections between social learning, social

cognitive, narrative, and cultivation theories as means for socially constructing a pilot's unique

view of flying. When pilots engage in high-quality narratives, they can vicariously learn from

them and choose how to act upon that learning. This process can determine the kind of pilots

they become and influence the type of hangar flying content they will consume.

In light of these findings, hangar flying has the potential to be a viable supplement to a

general aviation pilot's ongoing flight education. Hangar flying, as indicated in the comments,

has the potential to reveal new information and deepen learning beyond formal flight training.

The imparting of real-world knowledge from pilots who have "been there and done that" through stories may be more valuable than the memorization of textbook material, serving to fill gaps or correct deficiencies in formal flight training. Pilots, students, flight instructors, flight schools, general aviation industry leaders, and all those who create aviation content should take note of the power and impact of hangar flying stories as another tool for increasing pilot proficiency and flight safety.

Finally, this study reinforces that storytelling is an innately human tradition, helping people to share meaning and understanding with others while trying to make sense of our various worlds. Pilots do this through hangar flying, sharing experiences that educate, entertain, or inspire, all while continuing to construct their understanding of the aviation world and their place in it. This research has shown that the communication practice of hangar flying can be an impactful way to enable vicarious learning amongst pilots and potentially influence their flying culture and future behaviors. Even so, there is still more to discover regarding this aviation pastime. While the mediums of hangar flying have and continue to evolve, the essence of the storytelling practice has not changed. As this study indicates, hangar flying remains a valuable communication tool for vicarious learning among general aviation pilots and is an essential element of general aviation culture.

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