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Native Language Effects on Flight Training Performance

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Collegiate aviation programs and flight schools enroll a significant number of international flight students each year, and most of these student pilots are non-native English speakers (NNES). Admission of international students to collegiate aviation programs is partially based on the results of English language proficiency assessments such as the Test of English as a Foreign Language (TOEFL) and the International English Language Testing System (IELTS). According to Albritton (2007), these tests are not appropriate for assessing a student's ability to successfully complete flight training. The TOEFL and the IELTS holistically measure a student's English reading, writing, listening, and speaking skills. Since the total score is based on the combined scores for all these skills, a student who scores very high on reading and writing skills and very low on listening and speaking skills may be admitted to a collegiate aviation program based on the aggregate score. However, listening and speaking skills are critical for success in a flight training program, and a student pilot with inadequate listening and speaking skills may be unable to successfully complete flight training as a result. This research employed a survey sent to both native English speaking (NES) and (NNES) aviation students who recently passed the Federal Aviation Administration (FAA) Private Pilot check ride to determine the number of flight training hours to the first solo flight and the number of flight training hours to successful completion of the Private Pilot check ride. The number of flight training hours is thought to be a measurement of flight training performance. This study will determine if there is a significant difference in flight training performance between NES and NNES collegiate aviation students.

Problem

As of December 31, 2020, the Federal Aviation Administration estimated that there were 39,087 active pilots in the United States who live outside the United States and its territories (Federal Aviation Administration [FAA], 2020). This included 12,187 student pilots in training who live outside the United States. Many of these international pilots come to the United States because flight training opportunities in their native countries are very limited. If there are flight training opportunities in their native countries, the cost is very high compared to the cost of flight training in the United States. As a result, many aspiring commercial pilots from Europe, Asia, and South America come to the United States for their initial ground and flight training. Many of these international student pilots are NNES, and English proficiency is required to qualify for all FAA pilot certificates (FAA, 2017). Unfortunately, many of these NNES flight students struggle because of inadequate English language proficiency. The International Civil Aviation Organization (ICAO) established English to be the de facto language of international aviation in 1951. ICAO Annex 10, Volume II, 5.2.1.2.2 states that the English language shall be available on request at any airport that is used by international air carriers (International Civil Aviation Organization [ICAO], 2016).

Therefore, international student pilots training in the United States who plan to return to their home countries and fly internationally must continue to demonstrate English language proficiency.

Purpose

This research focuses on the initial flight training performance of student pilots who are NNES compared to student pilots who are NES. While the relationship between English language proficiency and flight safety is well documented, there is little research into the relationship between English language proficiency and initial flight training performance. International student pilots who come to the United States for aviation education and training may struggle because their experience with the English language is limited. Some are unable to complete flight training while others are forced to spend additional funds on remedial training. The additional hours of remedial flight instruction significantly increase the cost of training for international student pilots and puts a strain on the resources of the flight training institution. The purpose of this research is to determine if there is a significant difference in flight training performance between NES and NNES flight students.

Research Questions

1. Do NNES student pilots take longer to complete the first solo flight and the Private Pilot check ride than NES student pilots?
2. How do NNES and NES student pilots learn aviation English?
3. Do NNES and NES student pilots feel that aviation English training prior to initial flight training would improve flight training performance?

Hypotheses

Null Hypothesis: Non-native English-speaking student pilots do not take longer to complete the first solo flight and the Private Pilot check ride than native English speaking student pilots.

Alternate Hypothesis: Non-native English-speaking student pilots take longer to complete the first solo flight and the Private Pilot check ride than native English speaking student pilots.

Literature Review

The relationship between aviation English proficiency and aviation safety has been the topic of numerous research studies due to several high-profile commercial aviation accidents that have been partially blamed on inadequate aviation English proficiency. Indeed, the worst accident in commercial aviation history at Tenerife was due in part to communication errors. The Netherlands Aviation Safety Board investigated the cause of this accident and filed a probable cause report in 1978. This report indicated that a contributing factor was “inadequate language” during the radio transmissions between the KLM first officer and the Tenerife air traffic controller. The KLM first officer used

nonstandard phraseology when reading back the departure clearance to the tower when he ended his transmission with "we are now at take-off." The controller who had not yet given the KLM flight a clearance to take-off did not understand that the captain had initiated take-off without a take-off clearance. Recommendations made by the Netherlands Aviation Safety Board included a greater emphasis on compliance with clearances, use of standard phraseology, and avoidance of the words "take-off" in anything but a take-off clearance (Netherlands Aviation Safety Board [NASB], 1978). This accident clearly demonstrates the importance of clear and concise communication between pilots and air traffic controllers.

The accident at Tenerife occurred on March 27, 1977. Unfortunately, many more commercial aviation accidents due to inadequate aviation English have occurred since then, and the number of incidents reported due to inadequate aviation English has not decreased since the ICAO Language Proficiency Requirement (LPR) was strengthened in 2003 (Fowler et al., 2021). ICAO Annex 10, Volume II specifically addresses aeronautical telecommunications procedures for pilots and air traffic controllers who work on international flights. ICAO Document 9835 is a manual for aviation organizations to implement the ICAO LPRs. The focus of Annex 10 and Document 9835 is on professional pilots and air traffic controllers who work on international flights. These documents were not meant to address the aviation English assessment and training needs of flight training providers. While the importance of language proficiency for the safety of international commercial aviation has been well documented, the language assessment and training needs of flight training organizations (FTOs) that enroll NNES flight students has not received the attention that it deserves as illustrated by a Canadian flight training accident that occurred on March 17, 2017.

The Transportation Safety Board of Canada (TSB) investigation of a mid-air collision between two Cessna 152 training aircraft illustrates the risk posed by student pilots who have not demonstrated adequate aviation English proficiency (Transportation Safety Board of Canada [TSB], 2018). The two student pilots were both international students at the same flight school, and both were (NNES). One of the students had a private pilot license for single engine land airplanes, and the other student only had a student pilot permit. Both students had been assessed at the ICAO operational level 4 for English language proficiency which is the minimum English language proficiency required by the ICAO Language Proficiency Requirements (LPRs). The student who had a private pilot license had a total of 135.8 hours of total flight time, and the student who only had a student pilot permit had just 39.5 total flight hours. Both pilots were conducting solo training flights and had established two-way radio communications with air traffic control. Probable causes cited by the TSB accident investigation report included the student pilot's unauthorized climb to 400 feet above his altitude restriction and the private pilot's descent to 100 feet below his altitude restriction due to distraction

while troubleshooting a problem with the communications radio. The student pilot was fatally injured. The private pilot was seriously injured and both airplanes were destroyed. Although the student pilot's actions in climbing above his altitude restriction could not be explained, it was noted that pilots with minimum English language proficiency are at a greater risk for miscommunication with other pilots and air traffic controllers. The accident investigation report concluded that a misunderstanding of critical information could have contributed to this accident (TSB, 2018).

While there have been several studies about the relationship between aviation English proficiency and aviation safety (Baugh & Stolzer, 2018; Fowler et al., 2019) as well as recent media attention (The Times, 2017), there has been little research on the effect of inadequate English proficiency on flight training performance. Research has been published concerning the need for aviation English assessment tools and training curriculum. For example, Doty et al. (2021) surveyed aviation students from two collegiate aviation programs who were NNES to determine how performance in flight is related to levels of self-efficacy in the English language. The researchers were also interested in how frequently the pilots heard their native language (Spanish) while performing flight duties and their comfort level while performing flight duties in the English language. This data was collected to determine whether the pilots' preferred language influenced the ability to perform flight duties. The survey results indicated that 17% of the participants had experienced a lack of situational awareness due to inadequate English language proficiency. Spanish was the preferred language while performing flight duties for 75% of these participants, and 94% were only moderately comfortable or lower while performing flight duties in the English language. In addition, 52% of the participants indicated that they had experienced a lack of situational awareness due to another person's inadequate English language proficiency. Common issues from pilots who were moderately comfortable or lower with performing flight duties in the English language included a lack of understanding aviation English instructions and the inability to respond correctly due to poor vocabulary. According to Doty et al. (2021), these findings demonstrate not only a lack of proficiency in aviation English, but also a lack of proficiency in plain English which is required when communicating about nonstandard and emergency situations. The authors recommended that flight schools include training in plain English in addition to standard aviation English phraseology for NNES flight students.

Research by Bieswanger et al. (2020) focused on the communicative skills that are needed by NNES flight students who enroll in ab initio flight training programs taught by NES ground and flight instructors. The researchers collected survey data to answer two research questions (Bieswanger et al., 2020): "What communicative skills are necessary for NNES ab initio flight students in English-speaking environments and how can current research on English as a Lingua Franca

(ELF) inform the design of English courses for NNES ab initio flight students?" The researchers asked six NNES professional pilots questions about their communications experience during their flight training which took place in an English-speaking country. This was a qualitative research study with NNES professional pilots who were selected because they successfully completed their training using ELF and still used it professionally. According to Bieswanger et al. (2020), ELF is defined as a language between speakers or groups of speakers when at least one is not a native speaker of that language. ELF research has revealed that adaptation, explicitness, and accommodation are very important skills for ELF communication environments. The six professional pilots included three from Brazil and three from China. The participants were asked the following questions in English by one of the researchers (Bieswanger et al., 2020): "What is your nationality? What is your first language? Where did you receive your flight training? Did you speak English before your flight training? If so, was your English level sufficient during your training? Did you need to take an English test before flight training? Why? What kind of test? How was your experience with English in the country where you received flight training? Can you remember any problems you had?" All participants reported that the first problem encountered was everyday communication difficulties with members of the communities where the flight training organizations (FTOs) were located. Common issues included unfamiliar accents and unfamiliar local language. Another common problem was adjusting to the NES rate of speech outside of the FTO. Living arrangements were also cited as a problem because NNES flight students were frequently paired with other NNES flight students who usually shared their native language, and this lengthened the time it took to become proficient. In addition, the importance of participation in social events to improve English language proficiency was noted by all participants (Bieswanger et al., 2020).

Similar communication issues within the FTO were noted by participants. However, one participant stated that the instructors at his FTO slowed their rate of speaking when communicating with NNES student pilots. This FTO trained mostly Chinese student pilots who were sent for two weeks to a general English class before they were allowed to begin flight training. Flight instructors at this FTO also taught NNES student pilots basic radiotelephony skills by reviewing different scenarios that they may encounter in flight. One participant stated that the additional training was important because some NNES students failed not because they couldn't fly, but because their English language skills were so bad that their flight instructors could not endorse them to fly solo. A Brazilian pilot recalled being relieved to find that his instructor shared his native language. This instructor was familiar with his native language which enabled him to correct the NNES student's pronunciation difficulties. Prior to being assigned to this flight instructor, his pronunciation issues were never addressed even though he was frequently asked to

repeat radio transmissions by air traffic control. Two participants said that the added task of learning a different language while learning to fly airplanes was sometimes overwhelming. Some participants knew other NNES student pilots who failed to complete training due to inadequate English proficiency (Bieswanger et al., 2020).

The researchers concluded that many NNES flight students start their flight training with inadequate English language skills to effectively communicate in everyday life as well as in flight school. In addition, many NES ground and flight instructors do not possess skills to accommodate NNES student pilot language issues. Unfortunately, flight instructors are not taught language accommodation skills, and it is unlikely that the majority will ever learn these skills. Therefore, the researchers recommended that NNES student pilots communicate in English with NES individuals as much as possible before commencing flight instruction. English courses designed for NNES student pilots that include ELF awareness and communication strategies were also recommended which include linguistic skills that focus on the basic structures of the English language and familiarization with different accents (Bieswanger et al., 2020).

In a study focused on the process used by a Canadian flight training unit (FTU) to select candidates from China for a flight training program, Turner (2014) looked at the role of language and cultural issues. This FTU began selecting student pilot candidates in consultation with Chinese airlines that paid for their training if the candidate signed a contract committing to work for the airline for a predetermined number of years. It is interesting to note that some of these contracts committed students to a lifetime of service to the sponsoring airline. Unfortunately, students were selected without an evaluation of their language and communication skills. While most of these students were successful in their training, some failed due to inadequate English language proficiency. In addition to the students' lack of proficiency in the English language, Turner (2014) also noted that the instructors who were sent to China to conduct a preliminary ground school did not receive any cultural training and were not familiar with teaching English as a foreign language (EFL). Because many of the Chinese students were struggling with their training, the FTU began to modify the way Chinese flight school candidates were selected after 2008. See Table 1 which shows the evolution of the FTU selection process and Table 2 which shows completion data between 2008 and 2010. As Table 2 demonstrates, the average weeks to completion of training were reduced from a high of 74.3 weeks in late 2008 to a low of 61.1 weeks in late 2010. The FTU attributed the improvement in completion times and reduced attrition to improved candidate selection procedures which included Socratic teaching. Oral questioning which requires NNES student pilots to practice and improve their oral communication skills is the defining feature of the Socratic method of teaching.

Friginal et al. (2020) describe the language needs for flight training to be extremely challenging for both NES and NNES flight students. The restricted

register and fast pace of aviation English radio communications requires a skill level that is oftentimes well beyond the capabilities of a student pilot with no prior flight training experience. Student pilots must also communicate with flight instructors, aircraft dispatchers, and ground school instructors.

Table 1

Evolution of Assessment in China

	Assessment (2006-2008)	Assessment (2008 – 2014)
Candidate pool	Chinese males, age 18-25, no flight experience, 16–18-month ground school	
Assessment ground school in China	3 weeks	2 weeks
Instructor	Flight instructor with no qualification or experience	Flight instructor with experience training Chinese student pilots
Selection decision maker	Chinese airline personnel & flight instructor (Observer only)	Flight instructor
Assessment method	No formal assessment	Tests of visual spatial, logical math, and linguistic competence

(Turner, 2014)

Table 2

Student Attrition and Weeks to Completion

Arrival	Attrition	Completions	Avg. Weeks to Completion	Selection Protocol
Late 2008	7	42	74.3	None
Mid-2009	3	39	65.1	Early
Late 2009	8	39	66.1	Early
Mid-2010	2	34	68.4	Later
Late 2010	1	40	61.1	Later

(Turner, 2014)

In addition to communication skills, student pilots must be able to read aviation handbooks, textbooks, aircraft manuals, and checklists. Inadequate English

language proficiency can lead to training delays which will increase the cost of flight training and tie up scarce resources.

Methodology

This was a quasi-experimental quantitative research study analyzing statistical data obtained from a survey of NES and NNES flight students who trained for the FAA Private Pilot Certificate in the United States. Institutional Review Board (IRB) approval was first obtained as required when using human subjects in a research study. Ab initio flight students were asked to voluntarily complete a Qualtrics survey to obtain data about the number of flight training hours required before the participants' first solo flight and their Private Pilot check ride. In addition, the survey asked participants for the number of years of English language instruction they received before the start of flight training and the method they used to learn aviation English (see Appendix). There were no incentives or compensation offered to the participants for completing the survey.

The survey data was downloaded into a spreadsheet, and the data was imported into *R* for statistical analyses. A total of 240 students responded to the invitation to participate in this study, and 229 completed the survey. Of the 229 participants, 139 (61%) self-reported as NES, and 90 (39%) considered themselves as NNES.

Statistical Analysis for Research Question 1

The first research question consists of two parts. First, do NNES student pilots require more flight hours to complete the first solo flight than NES student pilots? Second, do NNES student pilots require more flight hours to complete the private pilot check ride than NES student pilots? For the first part of this question: NNES student pilots required an average of 8.3 more flight hours to complete the first solo flight (M = 31.09, SD = 17.06) than NES student pilots (M = 22.82, SD = 12.29). This difference was statistically significant $t(148.7) = -3.97$, $p < .05$. The difference represented a medium-sized effect $r = .31$. Similarly, the second part of the first research question revealed that NNES student pilots required an average of 10.9 more flight hours to complete the private pilot check ride (M = 66.72, SD = 19.38) than NES student pilots (M = 55.83, SD = 14.40). This difference was statistically significant $t(152.5) = -4.56$, $p < .05$. This difference represented a medium-sized effect $r = .35$. The null hypothesis is rejected at the 5% significance level. The results support the alternate hypothesis that NNES student pilots require more flight hours to complete the first solo flight and the private pilot check ride.

Statistical Analysis for Research Question 2

The second research question asked about the method used by NNES and NES student pilots to learn aviation English. Participants selected their responses from a list: "I used a software program to learn aviation English," "I used an App to learn aviation English," "I used a textbook to learn aviation English," "I took a class in aviation English," and "My flight instructor taught me aviation English

during my flight training." The most common response among both NES and NNES student pilots was that they learned aviation English from their flight instructors (see Table 3).

Table 3
Primary Method of Learning Aviation English

	Software	App	Textbook	Class	Instructor
NES	12	3	7	9	105
NNES	6	3	9	16	55

NNES student pilots were asked the additional question of how many years of English instruction they received (see Table 4). An ANOVA was conducted on the years of English language instruction and the time required to complete the first solo flight. While those who reported to have received one to two years of English instruction had the lowest time of 22.1 hours to reach the first solo, the difference was not statistically significant, F (3, 86) = 1.04, p = .38, ω = .04.

Table 4
Years of Instruction and Time to First Solo

Years of English Instruction	Hours to First Solo	Number of Participants
Less than one year	31.9	9
One to two years	22.1	10
Three to five years	32.1	10
Five or more years	32.3	61

An ANOVA was also conducted on the time required to complete the private pilot check ride and the number of years of English language instruction. There was a statistically significant difference in the time it took to complete the private pilot check ride, F (3, 86) = 3.26, p < .05. The results represent a large effect size ω = .26. A Tukey post hoc test showed that there was a significant difference between those who have had three to five years of instruction and those with one to two years of instruction (see Table 5).

Table 5

Tukey Post Hoc Analysis of Time to Private Pilot Check Ride

Years of Instruction		*p*-value	Significant Difference
1-2 years (57 hrs.)	*vs* less than 1 year (57 hrs.)	.99	No
3-5 years (79 hrs.)	*vs* less than 1 year (57 hrs.)	.05	No
5 or more years (68 hrs.)	*vs* less than 1 year (57 hrs.)	.35	No
3-5 years (79 hrs.)	*vs* 1-2 years (57 hrs.)	.04	Yes
5 or more years (68 hrs.)	*vs* 1-2 years (57 hrs.)	.35	No
5 or more years (68 hrs.)	*vs* 3-5 years (79 hrs.)	.29	No

Statistical Analysis for Research Question 3

The third research question asked about whether NNES and NES student pilots thought that aviation English training prior to initial flight training would improve flight training performance. Both NES and NNES student pilots indicated that learning aviation English in a classroom setting before flight training begins could lead to improved flight training results. For the NES student pilots, 104 (75%) indicated that it would either "probably" or "definitely" improve flight training results. For NNES student pilots, 73 (81%) felt that it would either "probably" or "definitely" improve flight training results. The difference in the percent of NES and NNES student pilots indicating "probably" or "definitely" is not statistically significant, $t(182.7) = -1.73$, $p = .09$ and represents a small effect $r = .13$.

Conclusions

NNES student pilots required significantly more time to complete both the first solo flight and the private pilot check ride than NES student pilots. Most NNES students take some form of English instruction prior to the start of flight training, but those English courses do not prepare the students specifically for what they will encounter in flight training. Although most NES and NNES flight students indicated that they learned aviation English primarily from their flight instructors, NES flight instructors do not receive special training on teaching English to speakers of other languages (TESOL) before they are assigned to teach NNES student pilots. Understanding how the English language is learned by NNES, particularly aviation English, would benefit flight instructors and NNES student pilots.

Guidance from the ICAO (2010) concerning recommended best qualifications for an aviation language trainer includes a master's degree in language teaching, TESL, TESOL, applied linguistics, foreign language education or related field. Although a flight instructor certificate is not recommended, experience as a pilot or controller is rated best for aviation communications qualifications. Since most of the NNES flight students who participated in this study learned aviation English from their flight instructors, some training for flight instructors in TESOL may result in lower completion times for NNES flight

students. Although it is unrealistic to recommend TESOL certification for every flight instructor who teaches NNES flight students, flight instructors who are trained in language accommodation, linguistic awareness, cross-cultural awareness, and cross-cultural sensitivity would be better prepared to teach aviation English to NNES flight students.

The number of years NNES student pilots spend in learning the English language before the start of flight training had some significance to the number of hours required to obtain the private pilot certificate, but it did not influence the number of hours required to complete the first solo. Furthermore, those who had an average of one to two years of instruction completed the private pilot check ride in shorter time than those who had more years of instruction. The reason for this finding could not be determined.

Recommendations

While the results of this study supported the alternate hypothesis that NNES student pilots require more flight hours to complete the first solo flight and the Private Pilot check ride than NES student pilots, future research should investigate whether more hours of ground instruction are required. If NNES student pilots require more time in ground instruction in addition to more flight training hours, this would further support the need to provide aviation English training before the start of flight training.

Research concerning the relationship between the length of English language instruction received before the start of flight training and the number of flight training hours required by NNES flight students may help flight training organizations select better qualified applicants in the future. Additional research is needed to determine why NNES flight students with only one to two years of English instruction completed Private Pilot training in less time than those with five or more years.

Both NES and NNES student pilots felt that more aviation-specific English language instruction would improve flight training. In the collegiate aviation setting, this could mean offering specific courses on aviation English. NNES flight students should be given aviation-specific English language instruction by properly qualified instructors. If offering additional courses in aviation English is not feasible, flight instructors assigned to teach NNES student pilots should at least receive special TESOL training in language accommodation, linguistic awareness, cross-cultural awareness, and cross-cultural sensitivity. TESOL training would give flight instructors the skills and knowledge needed to effectively teach aviation English to speakers of other languages.

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Appendix
Aviation English Research Disclosure & Survey

Information and Disclosure Section

The following information is provided to inform you about the research project in which you have been invited to participate. Please read this disclosure and feel free to ask any questions. The investigators must answer all your questions.

- Your participation in this research study is voluntary.
- You are also free to withdraw from this study at any time without loss of any benefits.

For additional information on your rights as a participant in this study, please contact the Middle Tennessee State University (MTSU) Office of Compliance (Tel 615-494-8918 or send your emails to irb_information@mtsu.edu. (URL: http://www.mtsu.edu/irb).

Please read the following and respond to the consent questions in the bottom if you wish to enroll in this study.

1. Purpose: The purpose of this research is to determine whether there is a significant difference in flight training performance between native English speakers (NES) and non-native English speakers (NNES) based on the number of total flight hours before the first solo flight and passing the Private Pilot check ride. In addition, data will be collected concerning the primary method of learning aviation English and opinions about whether formal aviation English training would improve flight training performance.

2. Description: There are several parts to this project. They are: Participants complete a short anonymous online survey. The data will be analyzed to determine whether there is a need for formal aviation English assessment and training programs for collegiate aviation students.

3. Duration: The whole activity should take about 15 minutes. The subjects must take at least 15 minutes to complete the study.

4. Here are your rights as a participant:
   a) Your participation in this research is voluntary.
   b) You may skip any item that you don't want to answer, and you may stop the experiment at any time.
   c) If you leave an item blank by either not clicking or entering a response, you may be warned that you missed one, just in case it was an accident. But you can continue the study without entering a response if you didn’t want to answer any questions.
   d) Some items may require a response to accurately present the survey.

5. Risks & Discomforts: There are minimal risks for participants in this research. There is no compensation for participants.

6. Benefits:

a) Benefits to you that you may not receive outside this research: There are no direct benefits to you.

b) Benefits to the field of science or the community: The data will be analyzed to determine whether there is a need for formal aviation English assessment and training programs for collegiate aviation students.

7. Identifiable Information: You will NOT be asked to provide identifiable personal information/You may provide contact information for follow-up / We may request your contact information for compensation purposes.

8. Compensation: There is no compensation for participating in this study.

10. Confidentiality. All efforts, within reason, will be made to keep your personal information private but total privacy cannot be promised. Your information may be shared with MTSU or the government, such as the Middle Tennessee State University Institutional Review Board, Federal Government Office for Human Research Protections, if you or someone else is in danger or if we are required to do so by law.

11. Contact Information. If you should have any questions about this research study or possibly injury, please feel free to contact Robert Fowler by telephone 615-898-5734 or by email at Robert.Fowler@mtsu.edu. You can also contact the MTSU Office of compliance via telephone (615 494 8918) or by email (compliance@mtsu.edu). This contact information will be presented again at the end of the experiment.

Survey Questions

Q1 You are not required to do anything further if you decide not to enroll in this study. Please complete the response section below if you wish to learn more or wish to participate in this study.

- ○ I do not consent. I do not wish to participate.
- ○ Yes, I consent. I have read this informed consent document pertaining to the above identified research. The research procedures to be conducted are clear to me. I confirm that I am 18 years or older. I am aware of the potential risks of the study.

Skip To: End of Survey If Information and Disclosure Section The following information is provided to inform you about the... = I do not consent. I do not wish to participate.

Q2 Is English your native language?

- ○ Yes
- ○ No

Skip To: Q4 If Is English your native language? = Yes

Q3 If English is not your native language, how many years of English language instruction did you have?

- ○ I had less than one year of English language instruction.
- ○ I had one to two years of English language instruction.
- ○ I had three to five years of English language instruction.
- ○ I had more than five years if English language instruction.

Q4 What was the primary method you used to learn aviation English?

- ○ I used a software program to learn aviation English.
- ○ I used an App to learn aviation English.
- ○ I used a textbook to learn aviation English.
- ○ I took a class in aviation English.
- ○ My flight instructor taught me aviation English during my flight training.

Q5 Do you think that learning aviation English in a classroom setting before flight training begins could lead to improved flight training results?

- ○ Definitely not
- ○ Probably not
- ○ Might or might not
- ○ Probably yes
- ○ Definitely yes

Q6 How many flight hours did you have before your first solo flight?

	0 10 20 30 40 50 60 70 80 90 100
Number of flight hours when you first soloed ()	

Q7 Do you think your first solo flight could have occurred sooner if you had learned aviation English in a classroom before beginning your flight training?

- ○ Definitely not
- ○ Probably not
- ○ Might or might not
- ○ Probably yes
- ○ Definitely yes

Q8 How many total flight hours did you have when you passed your Private Pilot checkride?

0 10 20 30 40 50 60 70 80 90 100

Number of flight hours when you passed your Private Pilot check ride ()	

Q9 Do you think that you could have passed your Private Pilot check ride sooner if you had learned aviation English in a classroom before beginning your flight training?

- ○ Definitely not
- ○ Probably not
- ○ Might or might not
- ○ Probably yes
- ○ Definitely yes

Q10 How often did you have trouble understanding your flight instructor?

- ○ Never
- ○ Sometimes
- ○ About half the time
- ○ Most of the time
- ○ Always

Q11 How often did you have trouble understanding other pilots on the radio?

- ○ Never
- ○ Sometimes
- ○ About half the time
- ○ Most of the time
- ○ Always

Q12 How often did you have trouble understanding air traffic controllers on the radio?

- ○ Never
- ○ Sometimes
- ○ About half the time
- ○ Most of the time
- ○ Always

Q13 How often did communication problems cause delays in your flight training?

- ○ Never
- ○ Sometimes
- ○ About half the time
- ○ Most of the time
- ○ Always

Q14 How often did communication problems compromise flight safety?

- ○ Never
- ○ Sometimes
- ○ About half the time
- ○ Most of the time
- ○ Always

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