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## COVID-19 IMPACTS ON COLLEGIATE AVIATION TRAINING

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### Abstract

In 2020, the COVID-19 pandemic has had a significant impact on the aviation industry. The regular day-to-day flight training routines have been altered for several reasons, including physical distancing requirements, disrupted training schedule, and the increased level of concern. Aviation educators will likely need to adapt their programs to optimize the learning experience, maintain effective safety delivery, and ensure competent graduates. The impact of the month-long break in flight training on the airmanship skills is also unaccounted for. This study surveyed collegiate aviation students to identify the COVID-19 shut down impacts on both their flight skill developments and the overall collegiate degree progress. Specifically, the study investigates the significance of improving communication, being innovative, requiring collaboration and flexibility, and better planning within aviation education programs. The study also provides practical tips on how the aviation education programs can adapt to the the continuously evolving pandemic landscape.

In early 2020, the COVID-19 pandemic shocked the world; this ultimately led to the significant slowing down of the then steady growth of the aviation industry. Various policy measures have since been implemented across the various countries to contain the spread and impact of the pandemic (Debata, Patnaik, & Mishra, 2020). These measures, including border closures and lockdown measures, have consequently led to a rapid decrease of aviation activities. The International Civil Aviation Organization (ICAO) confirmed that passenger traffic suffered a dramatic 60 per cent drop over 2020, bringing air travel totals back to 2003 levels (International Civil Aviation Organization, 2021). In higher education institutions, students are among those impacted by these measures such as the social restrictions – including social distancing and self-isolation measures (Al-Taweel et al., 2020). For the aviation students, that has slowed the hiring process for the recent graduates as well as the hands-on training such flight instructions (Ley, 2020). Due to the lockdown and social distancing measures, flight training activities have been slowed down to enable the colleges accommodate all the measures while conducting the trainings (FlightLogger, 2020). As a result, flight training activities were down to approximately 60 percent of the level before

Covid-19 during the lock-down periods (FlightLogger, 2020). These challenges have raised concerns among the students on how to best move forward; while the students are most passionate about the future career options, they are also concerned on how to accommodate the delays and resulting financial penalties(Ley, 2020; Plane and Pilot, 2020)

This paper attempts to shed light on the impact of COVID-19 pandemic on college aviation students. This study describes and quantifies the causal effects of the COVID-19 pandemic on students' flight training experiences. In particular, the study analyzes flight training progress, financial situation, career expectation, online learning experiences, and program supporting. For this purpose, we surveyed about 200 student pilots who enrolled in a college aviation program, in late February 2021. To that end, this study aimed to address the following research questions:

1. What is the perception of the collegiate aviation students regarding the impacts of the covid-19 pandemic on their financial situations?
2. What is the perception of the collegiate aviation students regarding the impacts of the covid-19 pandemic on their flight skills?
3. What is the perception of the collegiate aviation students on their academic progress given the changing nature of the course offering (such as online, hybrid, etc.) due to the pandemic?
4. What are the career challenges that the collegiate aviation students are facing due to the onset of the covid-19 pandemic?

## Method

This study aims to shed light on the impacts of COVID-19 pandemic on college aviation students and their flight training experiences. The study describes and quantifies the causal effects of the COVID-19 pandemic on students' flight training experiences. In particular, the study analyzes flight training progress, financial situation, career expectation, online learning experiences, and program supporting.

About 200 pilot students, all enrolled in a Part 141 collegiate aviation program, were contacted to participate in a survey in early 2021. The survey was delivered to the participants through an email correspondence. These student pilots were asked to participate in an online survey about their experiences in light of the COVID-19 pandemic. The survey was delivered in February 2021. The survey is structured as self-reporting 5-point Likert-scale survey one means disagree, five means agree, and three represents a neutral attitude.

The survey was programmed using a Google Form. Additional participants' information that was collected in the survey included students' demographics such as GPA, flight type rating, school tenure, gender, age, etc. The survey also collected the flight training location for future comparison study. A total of 209 respondents completed the survey. Three respondents were deemed ineligible for the study (such as enrolled in graduate degree programs or diploma programs) and were dropped from the sample. The final sample size of the survey participants is 206; the breakdown of the survey participants is provided in Table 1.

Table 1  
*Sample Information*

Gender	Number	GPA	Age	Total Flight Hours
Male	162	3.6	21.3	151.1
Female	39	3.7	20.3	124.9
Not disclosure	4	3.73	19.3	146.7

Overall, the sample of this study is a reasonable representation of students at many college flight programs. Usually, these programs have predominantly large number of male students. The average flight hours may also reflect the on-going training situation. It is important to acknowledge that college aviation programs may have additional resources to address the need for a global pandemic than general flight schools.

The study used the Principal Component Analysis (PCA) as well as descriptive statistic to answer the research question. PCA is a statistical analysis method used to reduce dimensions of data by clustering data into multiple factors. Factors that are revealed by PCA shed a light on students' concerns during the pandemic. One advantage of using PCA is that the study could obtain stable estimates even if there are violations of certain assumptions. On the disadvantage side, the quality of the results depends on the quality of the sample. The descriptive statistic helps the study in showing the impact of COVID-19 pandemic in an amicable way.

## Results

One of the significant findings is about the delay. Many students expressed that the COVID-19 pandemic has made them delay their flight training as well as graduation. The study finds that 80.3% students have experienced delay in their flight training, and 54.8% students have delayed their graduation.

### PCA Factors

The PCA yields 5 main factors (See Figure 1). They are *COVID-19 Problems, Job & Career, Financial, Program Supports*, and *Online Learning*. Each of the factors is a snap shot of student pilots' situation as of February 2021.

**COVID-19 problems.** The first heavy loaded factor is about the problems/concerns that are caused by problems. This factor includes questions regarding about the concern of their flight skill degradation, worrying the flight training progress, danger of COVID-19 infection during the flight training, and concerns regarding the potential job markets.

Generally, students believe that their flight skill has degraded during the pandemic, especially after the lock-down. As shown in Figure 2, more than 61% of students reported that the flight performance has been different after the lock down. In addition, more than 69% of students indicated that their light skill had degraded degradation due to the lockdown measures.

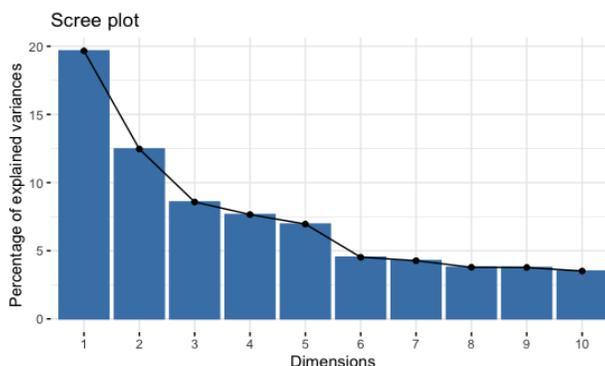


Figure 1. PCA Dimension Reduction results

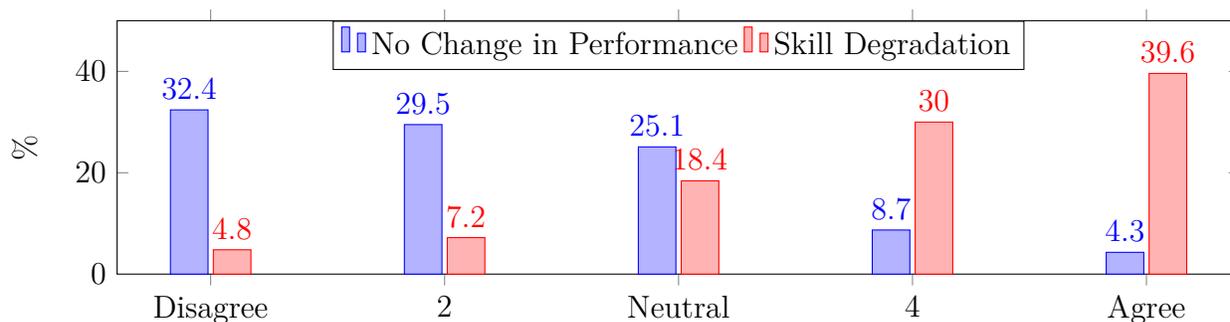


Figure 2. Students' Perception regarding flight performance and flight skill

**Online Learning.** The attitude towards online learning is negative. Students indicated that the quality of online learning is not as good as in-person teaching; they indicated not gaining the same knowledge with online learning as in-person learning, nor their experience is positive. However, the only positive feedback for online teaching is regarding the flexibility of making their own learning schedule as well as universities have maintained the quality of teaching.

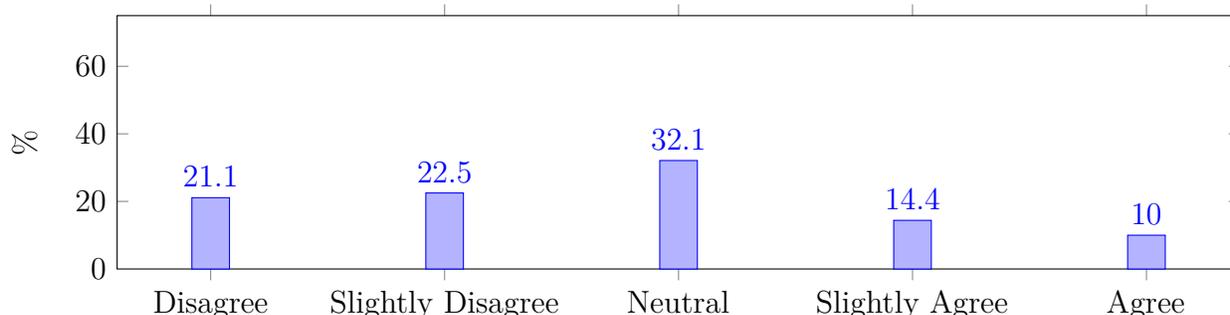


Figure 3. Perception of statement of having a positive online learning experience

Figure 3 shows that more than 40% of students hold a negative view regarding the online learning experiences. Only 10% of participants state that they had a positive online learning experiences during this pandemic.

**Job & Career.** The attitude toward the aviation job market is negative. Many students believe that they will have a difficult time in finding a job in the aviation industry.

This was expected by the researchers given the layoff and furloughs that have been happening in the aviation industry especially the airline sector. More than 79% of students hold a very negative view regarding the job market. Due to the current uncertainty in the job market, 42% of students are considering continuing their education (graduate school, etc.,) due to the gloomy job market.

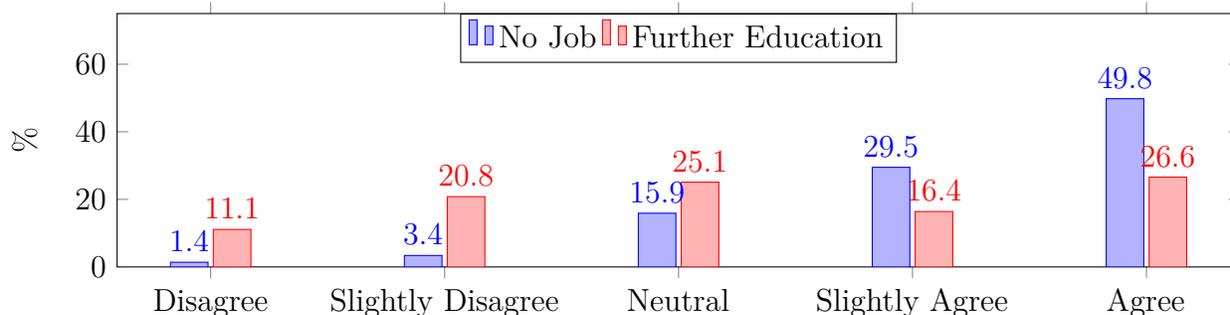


Figure 4. Students' Attitude to Job Market and Possibility of Further Education

**Financial.** The COVID-19 pandemic has impacted students financial budget for flight training. They also feel the flight training gets more expensive. Meanwhile, more than 40% of students think it is very hard to access financial resources for flight training.

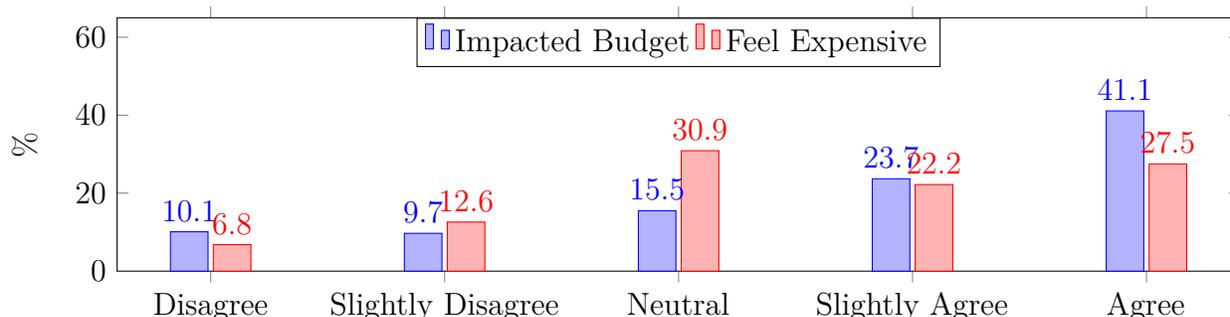


Figure 5. Students' Flight Training Financial Situation

**Program support.** Only 26% of participants agree that their program has offered some help in searching for internships and job positions. More than half of the participants believes that the program should offer more information regarding financial resources.

### Conclusion

The COVID-19 pandemic impacts the student pilots in many ways. More than half of them actually are need financial support for flight training during the pandemic. Most of the students feel that their flight skill has degraded due to the lock-down and lack of practice during the pandemic. Students' online learning experiences are not positive at all. They prefer face-to-face learning and teaching. Students also lack of confidence in the job market and the recovery of the aviation industry.

The impacts of the COVID-19 pandemic brought up challenges which if not addressed on a timely manner, they might also impact the aviation workforce in the near future. The distractions brought by the pandemic restrictions might also impact the skills of the future

pilots which if left to go unchecked might compromise the safety quality of the aviation industry in the future. In addition, there is also a chance that some students might consider changing career plans due to the uncertainty that surrounds the aviation industry. This goes against the efforts that various governments are implementing to ensure there will be sufficient workforce for both aircraft pilots and aircraft technicians in the next two decades.

As shown from the results, the COVID-19 pandemic has impacted the student pilots in various ways. The COVID-19 pandemic is actually increasing the student pilots mental stress due to the lock-down and cannot progress in training. At the same time, according to Xiong et al. (2020) the COVID-19 pandemic is associated with psychological distress significantly. The lock-down and stop of flight training delay students' training progress as well as increasing their financial burdens. The mental distress for student pilots should be emphasized in the aviation program and create some mitigation methods to help students coping with the situation.

The negative attitude towards online study is not surprising either. The sudden change of learning environment makes faculty have less time to adapt the situation. According to this study, faculties have maintain the quality of teaching, but students' learning experiences are still negative. The face-to-face interaction may be an important part in learning experiences. Especially for flight training, it is impossible to learn to fly based on a computer.

The last, but not the least, students need more support from the program. They need support in locating financial resources, in finding internship opportunities, job positions, and confidence building. It is important for the program to consider students' special needs during the pandemic. For example, in many collegiate aviation program, it is very difficult to find financial supporting information regarding flight training, as well as mental health support during the pandemic.

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