

An Analysis of the Effect of Self-Efficacy of Female Students in Collegiate Flight Programs

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An Analysis of the Effect of Self-Efficacy of Female Students in Collegiate Flight Programs



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Introduction:

- Women in Aviation Conference 2018
- Women continue to represent a small minority in the aviation industry
- 3.9% of FAA ATP certificate holders in 2010 to 4.5% in 2019
- 8.4% pilots (WAI, 2022)
- 30.2% nonpilot (WAI, 2022)

Purpose of the Study

- The purpose of this research was to examine the social cognitive career theory (SCCT) element of self-efficacy of female students in collegiate aviation programs to discern any possible gender differences in collegiate aviation programs to see if male aviation students have higher levels of self-confidence to help explain the gender representation gap in the aviation industry.
- This study hypothesized that: Male aviation students display a higher level of self-efficacy than female aviation students, demonstrating cause to the presence of a gender representation gap in the aviation industry.

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Social Cognitive Career Theory and Self-Efficacy:

- Social cognitive theory asserts that human behavior is determined by the interaction of three factors: environmental, behavioral, and cognitive (Bandura, 1986).
- **Self-efficacy** is an element of behavioral factors, that deals with an individual's belief in their capacity to address a certain set of circumstances (Bandura, 1977, 1986).
- **Self-efficacy = Self-confidence**

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Research Methods:

- The research population for this study consisted of students enrolled in four-year collegiate aviation programs found on the University Aviation Association (UAA) membership roster.
- The research instrument was composed of three parts:
 1. Demographic information: age, gender, declared aviation major, geographic location, and academic year classification.
 2. General Self-Efficacy Scale (GSES): Developed by Schwarzer in 1992, unidimensional scale, 10 questions, 4-point Likert Scale “Not At All True”, “Barely True”, “Moderately True”, or “Exactly True”. Scored 1-4 for each question and then totaled. The Higher the total score, the higher the perceived self-efficacy.
 3. Personal Comment Section.
- 145 respondents : 61% male and 39% female
- 13 self-identified geographic locations

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Research Questions:

- What effect does the element of perceived self-efficacy have on women in collegiate aviation flight programs?
- What effect does the element of perceived self-efficacy have on men in collegiate aviation flight programs?
- Do self-efficacy responses differ between female and male collegiate aviation students?

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Data Analysis:

- Results from this study were downloaded from Qualtrics survey software and imported in SPSS statistical software. Results from this study were analyzed using descriptive statistics (means, percentages, and frequency distributions) Cronbach's alpha, two-tail test (inequality), and independent t-test.

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Selected Results:

Likert Statement	Not at all true	Barely true	Moderately true	Exactly true
I can always manage to solve difficult problems if I try hard enough.	0.68% n=1	0.68% n=1	51.34% n=76	47.30% n=70
If someone opposes me, I can find a means and ways to get what I want.	4.05% n=6	21.62% n=32	60.14% n=89	14.19% n=21
It is easy for me to stick to my aims and accomplish my goals.	1.35% n=2	6.08% n=9	47.97% n=71	44.59% n=66
I am confident that I could deal efficiently with unexpected events.	0.68% n=1	4.73% n=7	44.59% n=66	50.00% n=74
Thanks to my resourcefulness, I know how to handle unforeseen situations.	0.68% n=1	6.08% n=9	50.00% n=74	43.24% n=64
I can solve most problems if I invest the necessary effort.	0.68% n=1	1.35% n=2	27.70% n=41	70.27% n=104
I can remain calm when facing difficulties because I can rely on my coping abilities.	2.03% n=3	14.19% n=21	35.14% n=52	48.65% n=72
When I am confronted with a problem, I can usually find several solutions.	0.68% n=1	8.11% n=12	47.30% n=70	43.92% n=65
If I am in a bind, I can usually think of something to do.	1.35% n=2	6.76% n=10	46.62% n=69	45.27% n=67
No matter what comes my way, I'm usually able to handle it.	1.35% n=2	3.38% n=5	39.19% n=58	56.08% n=83

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Selected Results:

- Overall, the findings of this study indicated that collegiate aviation students expressed a high level of confidence when it comes to problem solving, goal setting, and dealing with unforeseen circumstances. *Researchers found this encouraging because aviation is an industry with marginal room for error*
- The Cronbach's alpha analysis indicated a coefficient of 0.846 (good reliability) based on the George and Mallery (2003) scale.

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Selected Results:

- Because the overall results that collegiate aviation students expressed a high level of confidence when it comes to problem solving, goal setting, and dealing with unforeseen circumstances. To understand and explain the gender representation gap in the aviation industry, this research sought to identify if a difference exists between male collegiate aviation students' self-efficacy responses and female collegiate students' responses.
- A statistical difference **did not** exist between male and female collegiate flight students' self efficacy responses.

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Selected Results:

- The research utilized a two-tail test (inequality) to discern if a statistical difference exists between male collegiate flight students' self efficacy responses and female collegiate flight students' self efficacy responses to aid in answering RQ 3 "Do self-efficacy responses differ between female and male collegiate aviation students?". The observed difference between the sample means (3.28 – 3.41).

Table 2

Male/Female Self-Efficacy Responses

	Females	Males
	<i>Variable 1</i>	<i>Variable 2</i>
Mean	3.280701754	3.417045455
Variance	0.037618413	0.056217
Observations	10	10
Hypothesized Mean Difference	0	
Df	17	
t Stat	-1.407510662	
P(T<=t) one-tail	0.088649003	
t Critical one-tail	1.739606726	
P(T<=t) two-tail	0.177298006	
t Critical two-tail	2.109815578	

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Selected Results:

However, in completing an independent t-test between the research sample and the generalized American adult population (Schwarzer, 2014) results statistically demonstrated at the 95% confidence interval that collegiate aviation students display a higher level of self-efficacy than the average American adult.

Table 3

Collegiate Aviation Student/American Adult Self-Efficacy Responses

Descriptive Statistics

Sample	N	Mean	Standard Dev	SE Mean
Collegiate Aviation Students	145	33.45	6.47	0.54
American Adult Population	1594	29.48	5.13	0.13

(Schwarzer, 2014)

Estimation for Difference

		Difference	95% CI for Difference	
		3.970	(2.878, 5.062)	
T-Value	DF			P-Value
7.18	160			0.0000000000

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Selected Results:

- A statistical difference **did not** exist between male and female collegiate flight students' self efficacy responses. **However, a difference existed in students' self efficacy responses and personal comments.** Both male and female students expressed high confidence levels on their surveys, but in the personal comment section, students—especially females commented on what it's like to be a women in aviation and gave their opinions of the potential reasons behind industry underrepresentation.
- Over half (54%) of students that responded in the personal comment section gave their own personal experiences and observations regarding women in aviation.

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Selected Results:

- As suggested by Creswell and Creswell (2018) the researchers identified significant statements that were left in the personal comment section and clustered them into themes.
- The most common themes seen in the personal comment section was overall students' awareness that aviation is highly homogenized and predominately male including the student population and work force.
- Other comments included social stereotypes
- Gender Barriers
- Gender Biases

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Conclusion:

- The research concludes that the gender gap representation in aviation **does not come from lack of unequal levels of self-confidence** but suggest rather it comes from a multitude of other things mentioned in the personal comment section like personal experiences, gender barriers/biases, lack of gender association, and industry representation.

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Questions ?

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