ERD 2017
Education, Reflection, Development, Fifth Edition

EVALUATION OF A COACHING PROGRAM WITH AB INITIO STUDENT PILOTS

Ioana Koglbauer (a)*
*Corresponding author

(a) Graz University of Technology, Institute of Mechanics, Kopernikusgasse 24/ IV, 8010 Graz, Austria,
E-mail: koglbauer@tugraz.at

Abstract

The aviation industry estimates an extraordinary demand for new pilots worldwide over the next 20 years. Women are underrepresented in the pilot population worldwide and there is concern in the aviation industry that talented women are going to other industries and do not approach or even leave the aviation field. Previous research hypothesized that role models and coaching programs could be effective for overcoming barriers in the success of pilot training, especially for women. In this explorative study a standardized group coaching program was conducted by active airline pilots. The coaches conducted a discussion with a group of student pilots. The coaching session was moderated by an aviation psychologist and addressed issues such as learning strategies, difficulties and solutions to overcome them, mentoring, financing, getting a job as pilot, fulfilling of career expectations, combining the work and family life. The coaching program was evaluated with 36 ab initio student pilots (17 females). All females and 74% of males evaluated the coaching program as useful. The results show that student pilots' fear of failure, of disgracing themselves during flight training was significantly reduced after coaching. The coaching did not significantly influence the motivational factors challenge, probability of success and interest. The motivational factors fear of failure, of disgracing oneself and challenge were significantly stronger in females than in males. No significant gender differences were found in the self-reported prospects of success and interest in the flight training.

1. Introduction

The aviation industry estimates a worldwide demand for 617,000 new commercial airline pilots over the next 20 years (Boeing, 2017). Innovative solutions are sought to inspire and attract the new generation of pilots. Currently women are seriously underrepresented in the pilot population as they account for less than 6% of the pilot population worldwide (Metz, 2012; Mitchell, Kristovics, Vermeulen, Wilson & Martinussen, 2005). There is concern in the aviation industry that talented women are attracted to other industries and do not approach or even leave the aviation field (Bailey, 2001). In Europe and the United States the universities specialized in aviation seek to increase the enrolment of women. Currently social factors seem to be a reason for the low proportion of women pilots: reduced social acceptance of the pilot profession for women, perceived inability to balance work and family life (Turney, Bishop, Karp, Niemczyk, Sitler & Green, 2002; Mitchell, Kristovics & Vermeulen, 2006) or the relatively high costs of the professional training (Metz, 2012).

A survey performed at the Embry Riddle Aeronautical University, Arizona State University, and Kent State University with 390 college students (195 women and 195 men) showed that in the first year of study female students seem to have less confidence and more concerns about balancing the pilot work and family life than male students (Turney et al., 2002). In addition, the study showed that female students need female role models, and mentoring can be an effective means of supporting the retention of female students. In a survey conducted with 54 female flight students, 157 female pilots, 52 female and 33 male flight instructors Hamilton (2014) investigated women's motivation and barriers to success in general aviation. The results identified barriers that stop women from learning to fly such as the lack of female mentors and support systems (e.g., coaching), lack of confidence and support from family and friends who consider flying as too dangerous (Hamilton, 2014). Research shows that domain-specific coaching can improve the understanding of a problem and the motivation to approach it (Behrendt, 2012). Motivation affects what people learn, the intensity and duration of their learning activities (Bandura, 1991). Rheinberg, Vollmeyer and Burns (2001) identified four motivational factors related to learning and achievement: fear of failure, estimated probability of success, interest, and motivation to approach the challenge. This study describes and evaluates the effects of a standardized coaching program on the motivation of student pilots for learning to fly.

2. Problem Statement

Although being a pilot is an exciting and relatively well-paid job, research shows that flying is perceived by many girls and women as a gender stereotyped activity: "too difficult", "too dangerous" or inappropriate for the female gender (Gibbon, 2014). According to the stereotype threat theory it is expected that people perform worse in a domain in which they are negatively stereotyped. The "threat of possibly being judged and treated stereotypically, or of possibly self-fulfilling such a stereotype" can influence someone, even if the person does not believe in the stereotype (Steele & Aronson, 1995, p. 798). For example, when a math test was described as favouring men and the stereotype threat was high women showed significantly worse math test performance than men despite equal qualification (Spencer, 1999). Stereotype threat influences performance through various mechanisms such as inappropriate arousal (Easterbrook, 1959), over-cautiousness (Green, 1985) or effort inhibition because of low performance

expectations (Bandura, 1977, 1986). Vick, Seery, Blascovich and Weisbuch (2008) investigated motivational implications of the stereotype threat. They showed that in the performance of a gender-biased task (e.g., when the participants believed that men perform the task better than women) women were threatened, whereas men were challenged during performance (Vick et al., 2008). Interestingly, when the task was presented as gender-fair, women were challenged, but men were relatively threatened (Vick et al., 2008). A person experiences threat when the perceived demands exceed the perceived resources (Blascovich & Mendes, 2000). In addition, a person experiences challenge when the perceived resources exceed the task demands (Blascovich & Mendes, 2000). In summary, research shows that gender stereotypes can affect the motivation and performance of women and men. Thus, gender stereotypes related to the flying activity are expected to affect the motivation for learning to fly of both women and men. As a countermeasure, coaching is considered an effective intervention for improving the motivation to approach career challenges and problems (Behrendt, 2012).

3. Research Questions

This study investigates the effect of a group coaching program on four motivational factors related to learning and achievement: fear of failure, probability of success, interest, and motivation to approach the challenge. The hypothesis is that student pilots' fear of failure will be reduced and their self-reported probability of success, interest, and motivation to approach challenge will be increased after coaching. In addition, gender differences in the motivation of learning to fly are addressed.

4. Purpose of the Study

This study evaluates a coaching concept for improving the motivation of student pilots for learning to fly. Special attention is given to female student pilots, as research has identified gender specific barriers for women pursuing a career in aviation (Gibbon, 2014; Mitchell et al., 2006; Turney et al., 2002). There is concern in the aviation industry that talented women do not approach or leave the aviation field (Bailey, 2001). Following the principles of equal opportunities, the females and males are equally represented in the coaches and student pilot groups.

5. Research Methods

5.1. Participants

The coaching program was evaluated with 36 ab initio student pilots (17 females, M=27.24, SD=1.30 years of age) and (19 males, M=24.42, SD=.58 years of age). Informed consent was obtained from each participant.

5.2. Procedure

Each coaching session was held with active airline pilots (a female and a male) and a group of student pilots. The total duration of a coaching session was 3 hours (1.5 hours per pilot). Each session began with a brief self-presentation of the pilot addressing issues such as employer, type ratings, and professional experience followed by a brief presentation of the student pilots. The student pilots were encouraged to ask

questions and the following issues were addressed in a group session moderated by an aviation psychologist:

- Conditions of flight training (e.g., age, flight school, airplanes, ratings)
- Financing of the flight training
- Successful learning strategies to complete the flight training
- Resources/ support for successfully completing the flight training
- Highlights of the flight training
- Difficulties during the flight training and means to overcome them
- Mentoring during the flight training
- Starting a professional pilot career
- Getting a job as a pilot
- Fulfilment of expectations regarding the pilot profession (e.g., job attractiveness, requirements, salary)
- Balancing family and work life, airline programs (e.g., flexible time and scheduling)

Finally, the student pilots were informed about the possibility to have additional coaching and support from the airline pilots.

5.3. Dependent Measures

Four motivational factors related to learning and achievement (fear of failure, estimated probability of success, interest, and motivation to approach the challenge) were measured using the Questionnaire on Current Motivation (QCM; Rheinberg et al., 2001). This questionnaire had satisfactory reliabilities measured in six populations with 944 subjects. In this study the student pilots filled the QCM questionnaire before and after the coaching session. In addition, the usefulness of the coaching session was evaluated by the student pilots at the end of the session.

5.4. Data Analysis

The effect of coaching on student pilots' motivation was evaluated using the analysis of variance with repeated measures. Time was a within-subjects factor with two levels (before and after coaching) and gender was a between-subjects factor. Alpha was set at 0.05.

6. Findings

6.1. Coaching Effects

Student pilots' fear of failure was significantly stronger before coaching (M=13.51, SD=.73) than after coaching (M=10.67, SD=.75), $F(1,34)=12.35$, $p < .001$, $\eta^2=.27$. The effect of coaching on the motivation to approach the challenge, estimated probability of success and interest did not reach statistical significance. The coaching session was evaluated as useful by 100% of females and 74% of males.
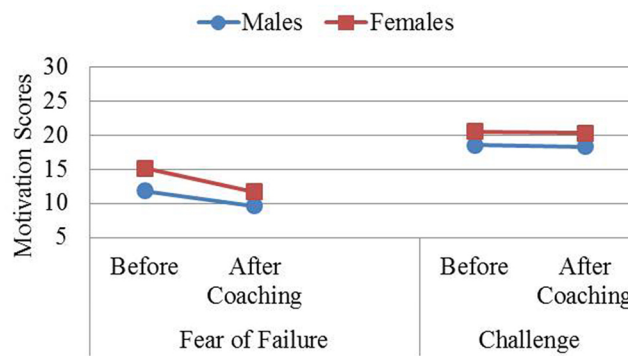
Figure 01. Fear of failure and challenge scores before and after the coaching

6.2. Gender Differences

The fear of failure was significantly stronger in females (M=13.44, SD=.90) than in males (M=10.74, SD=.85), $F(1,34)=65,62$, $p < .04$, $\eta^2=.12$ (Figure 1). The motivation to approach the challenge was significantly stronger in females (M=20.41, SD=.65) than in males (M=18.42, SD=.61), $F(1,34)=4.96$, $p < .03$, $\eta^2=.13$ (Figure 1). Gender differences in the estimated probability of success and interest did not reach statistical significance. The mean scores are presented in Figure 2.
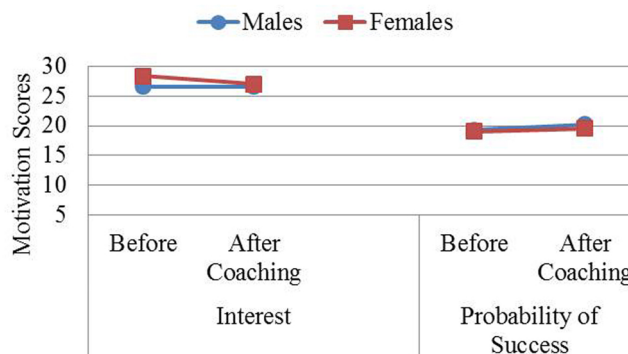
Figure 02. Interest and estimated probability of success scores before and after the coaching

7. Conclusion

The coaching program was considered useful by all females and three quarters of the male student pilots. These results confirm that female student pilots need female role models and coaching programs (Hamilton, 2014; Turney et al., 2002). In addition, this study shows that also male student pilots consider coaching useful and benefit from a coaching program. This study hypothesized that student pilots' fear of failure will be reduced and their estimated probability of success, interest, and motivation to approach challenge will be increased after coaching. The results show that after coaching the fear of failure (e.g., disgracing oneself) of student pilots diminished significantly. This effect is attributed to the domain competence of the coaches that addressed solutions to overcome learning difficulties as a normal part of the pilot career development. Coaching effects on the motivation to approach the challenge, estimated probability of success and interest were of no statistical significance. Thus, the first research hypothesis was only partially confirmed.

In addition, the results show that fear of failure was significantly stronger in females than in males. This can be explained by the gender stereotypes related to the flying activity (Gibbon, 2014) which can activate a stereotype threat (Steele & Aronson, 1995). However, the motivation to approach the challenge was also significantly stronger in females than in males. Notwithstanding the affirmation of Blascovich and Mendes (2000) that a person experiences challenge when the perceived resources exceed the task demands, and experiences threat when the demands exceed the resources the results of this study suggest that there are other factors that may contribute to fear of failure and challenge in the field. Interestingly, gender differences in the self-reported probability of success and interest did not reach statistical significance. In conclusion, the coaching program was useful for the student pilots of both genders and contributed to reduce the fear of failure. These results are encouraging for developing future coaching programs for student pilots. More research is necessary to fully understand the mechanisms mediating the effect of gender stereotypes on the motivation of learning to fly.

Acknowledgments

References

Bailey, T. (2001). Keynote address. Women in Aviation International Conference. Reno, NV, March 22-24.

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioural change. *Psychological Review, 84,* 191-215.

Bandura, A. (1986). Fearful expectations and avoidant actions as coeffects of perceived self-inefficacy. *American Psychologist, 41*, 1389-1391.

Bandura, A. (1991). Human agency: The rhetoric and the reality. American Psychologist, 46, 157-162.

Behrendt, P. (2012). Freiburger Erfolgsfaktoren-Coaching. Vier Erfolgsfaktoren zur Etablierung von Konsistenz bei Coachees. *Organisationsberatung, Supervision, Coaching, 19*(4), 391-404. http://dx.doi.org/10.1007/s11613-012-0296-7

Blascovich, J., & Mendes, W. B. (2000). Challenge and threat appraisals: The role of affective cues. In J. P. Forgas (Ed.), *Feeling and thinking: The role of affect in social cognition* (pp. 59-82). Paris: Cambridge University Press.

Boeing (2017). Long-term market. Current market outlook 2016-2035. Retrieved May 13, 2017, 16:31 from http://www.boeing.co.at/commercial/market/long-term-market/pilot-and-technician-outlook/.

Easterbrook, J. A. (1959). The effect of emotion on cue utilization and the organization of behaviour. *Psychological Review, 66,* 183-201.

Gibbon, D. (2014). Difficult, dangerous, not a job for girls: Factors impacting women and girls' orientation towards pilot careers. In D., Bridges, J., Neal-Smith, & A. J., Mills (Eds.), *Absent Aviators: Gender Issues in Aviation* (pp. 43-72). Surrey, England: Ashgate Publishing Ltd.

Green, R. G. (1985). Evaluation apprehension and response withholding in solutions of anagrams. *Personality and Individual Differences, 6,* 293-298.

Hamilton, P. R. (2014). The teaching women to fly research project. In D. Bridges, J. Neal-Smith, & A.J. Mills (Eds.). *Absent Aviators* (pp. 313-331). Surrey, England: Ashgate Publishing Ltd.

Metz, G. (2012). Warum ist der Himmel blau? Eine Ursachen-Analyse der (De-)Motivation von Frauen für den Beruf der Linienpilotin [Master Thesis]. Karl-Franzens-University of Graz.

Mitchell, J., Kristovics, A., Vermeulen, L., Wilson, J., & Martinussen (2005). How pink is the sky? A cross-national study of the gendered occupation of pilot. *Employment Relations Record, 5(*2), 43-60.

Mitchell, J., Kristivics, A., & Vermeulen, L. (2006). Gender issues in aviation: pilot perceptions and employment relations. *International Journal of Employment Studies, 14*(1), 35-59.

Rheinberg, F., Vollmeyer, R., & Burns, B.D. (2001). QCM: A questionnaire to assess current motivation in learning situations. *Diagnostica, 47*, 57-66.

Spencer, S. J. (1999). Stereotype Threat and Women's Math Performance. *Journal of Experimental Social Psychology, 35*(1), 4-28.

Steele, C. M, & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology, 69*(5), 797-811.

Turney, M.A., Bishop, J. C., Karp, M. R., Niemczyk, M., Sitler, R. L., & Green, M. F. (2002). National survey results: retention of women in collegiate aviation. *Journal of Transportation, 7*(1), 69-92.

Vick, S. B., Seery, M. D., Blascovich, J., & Weisbuch, M. (2008). The effect of gender stereotype activation on challenge and threat motivational states. *Journal of Experimental Psychology, 44*(3), 624-630.