**Diversity Recruiting in Aviation**

This article is based on Dr. Paul Foster’s dissertation and the presentation during the Professional Women Controllers Training Symposium held in Phoenix, AZ in April 2016.

Analysts and researchers have been warning that a shortage of qualified aviation professionals will severely impact aviation. There simply are not sufficient students studying aviation to supply an industry experiencing steady growth. In order to rectify this limitation, the aviation industry and technical schools must develop recruitment strategies to encourage and initiate interest among women and minorities to participate in aviation career preparation. Women and minorities can be viewed as an untapped resource that can help meet the shortage of aviation professionals. These entities must then provide an equal opportunity for minorities to develop basic academic competencies to pursue successfully the aviation careers they choose.

The under-representation of women and minorities in aviation careers has been a problem confronting the aviation industry throughout its history. A white male-dominated occupation, aviation has resisted encroachment despite national trends and pressures to include greater numbers of women and minorities in all occupational fields of aviation. Despite repeated efforts by the industry to institute minority recruitment programs, a great void remains between employment equity and the number of women and minorities employed in the field of aviation.

The 1993 FAA Study showed that the lack of qualified women and minorities in the hiring pool may be primarily a result of their lack of awareness of the diversity of lucrative aviation career opportunities open to them.
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The purpose of my study was to identify issues and concerns regarding the participation of women and minorities in aviation training. In an effort to ensure that the issues and concerns of minorities were addressed, aviation schools located in states having a large percentage of minorities were selected. More specifically, the research questions that were examined in this study are as follows:

1. What is the current representation of females and minorities on aviation school faculties?
2. What are the major issues and concerns related to the participation of minorities within aviation training programs?
3. What are the attitudes toward the recruitment of more minorities as students and the hiring of more minorities as faculty?
4. What strategies can be used to increase and improve the recruitment of minorities?

The significance of the study was based on the perceptions that Aviation Schools wanted information regarding the identification and analysis of critical factors that affect the preferences of minority students in their selection of an aviation school.

**Findings**

The majority (34) of participants were male and 9 were female. The majority ethnicity was Black (n = 16), followed closely by White (n =15). This finding is not significant since the purpose of this study was to identify issues and concerns regarding the participation of women and minorities in aviation training.

Both women and minorities agreed on the top three barriers preventing them from pursuing aviation as a career. In order of ranking, they agreed that lack of role models
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was the number-one barrier, followed by the lack of mentors and the lack of personal contacts.

When it came to encouraging women and minorities in aviation, they agreed, in ranking order, that mentoring was the number-one method, followed by participating in career days and career counseling.

There was an overwhelmingly yes response to recommending aviation as a career to women and minorities. Promoting diversity came through outreach programs and diversity training.

The majority (29) of the participants do not have relatives working in aviation maintenance, and few (10) have relatives with aviation experience from the military. A few (18) participants obtained their experience through the military. The majority (25) of the participants were self-motivated in pursuing aviation as a career. The majority (26) of the participants do not belong to a professional association nor did they have a mentor. Interestingly, more than 70% of the participants were between the ages of 10 and 20 years when they became aware of aviation as a career.

**Conclusions**

The conclusions of this study have practical implications for aviation maintenance technician schools. The recruitment of women and minorities is critical to the energy, impact, and, ultimately, the direction of the institution. Women and minorities who feel supported and cared for will bring vitality and health to any organization. Based upon the findings of this research, the following conclusions have been drawn.

*Women continue to be underrepresented in aviation, although they are gaining some ground.* The findings of the study revealed 34 respondents (79.07%) were male and
9 (20.93%) were female. The literature review acknowledges that there are few women and minorities in faculty positions, confirming that today’s aviation work force still remains under-represented by women and minorities. The 2000 U.S. Census confirms that Hispanic, African-American, and Asian American markets are growing faster than the mainstream population in both numbers and purchasing power. Yet, the literature review notes that multicultural markets are typically underserved and overlooked. This may be part of the problem.

Lyons (1989) noted that higher education institutions could not adequately fulfill the needs of their students, especially minority students, with no minority faculty. The pool of women and minority faculty applicants will grow when more women and minority students are recruited into aviation training programs. More minority participation will take place when minority students are encouraged to complete courses in mathematics, physics, chemistry, electronics, computer science, and mechanical drawing, because many of the principles associated with these subjects are involved in the operation of aircraft.

*Women of color may be significantly underrepresented in aviation.* The study’s findings revealed that of the nine females completing the survey, eight were white and one was black. There were no responses from Native American, Asian, or Hispanic females.

Northouse (1997) agrees that stereotypes about women hinder their ability to move ahead. He also notes that there is a great deal of research on the stereotyping and negative preconceptions about the abilities of women and other minorities to lead. Until society accepts minorities in the role of leaders, we may never be able to recruit
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adequately and retain qualified individuals for aviation. Rodriguez (1986) found that delimiters such as sex stereotyping, psychological and cultural constraints, lack of information, and lack of encouragement from school personnel were obstacles to female involvement in nontraditional careers.

In a study that examined how sex stereotyping creates and maintains barriers for women who wish to enter in male-dominated fields of employment, Ruble, Cohen, and Ruble (1984) concluded that sex stereotyping does exist and it operates in ways that limit the employment possibilities and advancement of women in the work force.

Integration of women of color into the aviation industry, as in many other industries, was a slowly evolving phenomenon. Douglas (1991) noted that the barriers Black women faced were three-fold: race, class, and sex; each militated against their participation.

Regardless of the color of their skin, women, Douglas (1991) also noted, had to overcome several obstacles. First and foremost, they were not wanted. The most difficult prejudice for them to overcome was not that feminine mechanical aptitude lacked social acceptance but rather the notion that women belonged in the home.

Douglas (1991) noted that the inclusion of women in aviation was experimental; a means for the Civil Aviation Authority (CAA) to gain experience in encouraging women to become involved with general aviation. She found this attitude was based on the premise that women made most of the important financial decisions in a household, and, thus, could have a substantial impact on the aviation sales market. Not all women aviation workers at this time were pilots; many became involved in the process of maintaining aircraft.
Hansen and Oster (1997) have noted that Aviation occupations, although changing, do not mirror the diversity of the overall American work force. Although aviation employees as a group are not dramatically different in sex, race, and ethnic makeup from all employees, the representation of women and racial minorities varies substantially from occupation to occupation. Hansen and Oster have noted that pilots and senior managers continue to be predominantly white and male; and other aviation professionals are less likely to be white than are pilots and managers but are still mostly men.

These employment patterns are in part the result of a history of explicit and implicit policies against hiring women and minorities for aviation jobs in the military and at the airlines, policies that have been the subject of legal challenge and government investigation for several decades. The aviation work force is still affected by a history of discrimination. Although substantial progress has been made, concerns about discrimination still exist. Smith (1982) found that females who pursued male traditional vocational training were not achieving the level of labor market success (pay and job level) of males, but they were earning significantly higher wages than females in traditional occupations.

Minorities and women are better represented in military aviation specialties than they used to be, but with the exception of minority male technicians, their presence in these jobs is small and still significantly lagging their representation in the overall population. The FAA 1993 Research Committee reported that because the proportion of aviation maintenance technicians who are minority and women in particular is very low, the military draw down would not have much effect on the diversity of the pool of trained
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aviation maintenance technicians available to the air carriers. The explanation offered by the committee indicates that opportunities are shrinking for minorities and women, as well as for white men to receive aviation maintenance training by joining the armed services.

*Barriers still exist preventing women and minorities from entering and participating in aviation maintenance.* Women identified the lack of role models, the lack of mentors, and the lack of personal contacts as being the major barriers that prevent them from pursuing aviation maintenance as a career. This finding demonstrates the importance of identifying and eliminating those barriers that prevent women from pursuing aviation as a career. Minority males identified the lack of role models, the lack of mentors and the lack of personal contacts as being the major barriers that prevent minorities from pursuing aviation as a career. This finding demonstrates the importance of identifying and eliminating those barriers that prevent minorities from pursuing aviation as a career.

The findings of the study supports the 1993 FAA research, which noted, the lack of mentors as a barrier that prevented women and minorities from pursuing aviation as a career. Additional findings from the literature indicated that there were a number of barriers that limit the involvement of women and minorities in this white-male-dominated career. Delimiters, constraints, lack of information, and lack of encouragement were found to be obstacles to women and minorities involvement. The literature also demonstrated the importance role modeling and mentoring has for those seeking entry into nontraditional careers.
The survey participants unanimously agreed that barriers still exist that prevents women and minorities from pursuing aviation as a career. Minority faculty and department chairs are needed to fulfill positions as role models and mentors to provide encouragement. This finding concurs with a study conducted by Louque (1994) who found that the primary reason for having appropriate minority and women representation on a faculty is to provide mentors, motivators, and role models. The findings also support Schrieber (2001) who recommended assigning minority mentors to advise and assist minorities in functioning successfully with members of the traditional work force. Encouragement is needed for minorities to show promise in the field of aviation. Witty (1989) notes that encouragement is also needed for the non-minority workers to provide understanding of authority figures whose racial/ethnic backgrounds are different from their own.

School Counselors and Military Recruiters are not playing a strong role in encouraging women and minorities to consider aviation as a career. The findings of the study revealed 25 respondents (58.14%) were self-motivated when it came to pursuing aviation as a career, 7 respondents (16.28%) were encouraged by a friend, 6 respondents (13.95%) were encouraged by a relative, 3 respondents (6.98%) were encouraged by a Military Recruiter, and 2 respondents (4.65%) were encouraged by a School Counselor. Eighteen respondents (41.86%) obtained their aviation maintenance experience in the military, and 25 respondents (58.14%) did not obtain their aviation experience through the military. School counselors and Military Recruiters are less effective at encouraging women and minorities into aviation than Relatives and Friends.
The authors of the FAA 1993 Research Report found a lack of awareness among minorities about aviation careers coupled with a generalized lack of career information to be the most prominent reasons minorities do not pursue aviation career fields. The U.S. Department of Labor (1994) reported a lack of information concerning nontraditional career opportunities as a barrier to female entry into nontraditional careers. Sauter, Seidl, and Karbon (1980) studied the effects of high school counseling on nontraditional career choices and found that career information was a major factor in the decision-making process of selecting a career. Research conducted by Rodriguez (1986) indicates that high school students and counselors lack awareness of the varied employment opportunities in the aviation field. Using data collected from 100 department heads of colleges and polytechnical schools in England and Wales, Stoney and Reid (1981) concluded that in order to raise numbers of women in nontraditional career programs, the awareness of technical occupations for girls and women must be raised. Eiff, Rodriguez, Eiff, and Milton (1986) found that workshop presentations attracted women to nontraditional programs. Opp and Smith (1995) support this position in that they believe that a common element to recruiting strategies is the emphasis on reaching out to minority students while they are still in high school. They found that working with high school guidance counselors would facilitate the transfer of minority students from high school to college.

Many Aviation professionals appear to be working in isolation, without the support of mentors and professional organizations. The findings of the study revealed that 26 respondents (60.47%) did not belong to any professional associations, 10 respondents (23.26%) belonged to PAMA, 6 respondents (13.95%) belonged to AWAM
and 1 respondent (2.33%) belonged to ATEC. Additional findings of the study revealed that 10 respondents (23.26%) had a Mentor, and 33 respondents (76.74%) did not have a mentor.

There are organizations attempting to recruit and retain minorities in aviation. They are Minority Pilot Association/Academy, Women in Aviation International, the International Black Aerospace Council, the Organization of Black Airline Pilots, Inc., and Negro Airman International, which primarily recruit pilots. Louque (1994) notes that the support group environment generated within minority organizations has resulted in a dramatic increase in the recruitment and retention success rate of minorities in traditionally white male-dominant fields. Schrieber (2001) affirms this concept noting that African-Americans are highly responsive to organizations and efforts that give back to the community, viewing such efforts as a gateway to mutual respect, rather than an attempt to exploit the market solely as a revenue opportunity.

Baty (1999) noted that Women in Aviation International boast having more than 100 females from three aviation programs: aeronautical technology, flight, and administration. Louque (1994) supports the concept of critical mass, explaining that the more minorities enrolled in a program, the more minorities the program can attract.

The Association for Women in Aviation Maintenance (AWAM) is a nonprofit organization formed for the purpose of championing women’s professional growth and enrichment in the aviation maintenance fields by providing opportunities for sharing information and networking, education, fostering a sense of community, and increasing public awareness of women in the industry (Baty 1999).
The FAA 1993 Research committee reported that additional barriers to pursuing nontraditional aviation careers are the lack of mentoring programs, management training, and opportunities for career development. Mentoring is a key step to managing cultural change within the university and creating an alignment with its values and strategic direction. The mentoring process links existing and new programs in a manner that promotes overall professional growth throughout the aviation industry (Galbraith & Cohen, 1995). The lack of mentors could be offset by the recruitment of more minority faculty members. Schrieber (2001) notes that mentoring programs have proven to be highly effective in assuring the long-term success and retention of a diverse work force. In such programs, Schrieber notes that established and successful executives agree to mentor younger employees of their own ethnic background. Schrieber recommends assigning majority and minority mentors to advise and assist minority employees in functioning successfully with members of the traditional work force; and further recommends making successful mentoring a significant objective in performance appraisals.

*Career information should be provided to women and minorities during the latter stages of primary education and throughout secondary education.* The findings of the study revealed that 1 respondent (2.33%) reported being 10 years old when he became interested in aviation maintenance as a career, 34 respondents (79.07%) reported being between the ages of 15 and 22, 6 respondents (13.96%) were between the ages of 24 and 26, and 2 respondents (4.66%) found a career in aviation maintenance at the ages of 39 and 40 years old.
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Grouping the information, 31 respondents (72.09%) were between the ages of 10 and 20 when they became aware of aviation as a career and 12 respondents (27.91%) indicated an interest in aviation as career after the age of 20. The researcher sought to determine if there was a difference in the age at which females became interested in aviation as compared to their male counterparts. The majority of the females became interested in aviation as a career between the ages of 21 and 24; however the majority of the males were still between the ages of 10 and 20.

Findings from the literature reveal that career information should be provided to women and minorities during the latter stages of primary education and throughout secondary education. A majority of the respondents developed an interest in aviation between the ages of 10 and 20 years. This finding demonstrates the importance of counseling and other career-selection influences during the formative ages of 10 to 20 years. Specifically, it brings to light the importance of career education during the latter stages of primary education and throughout secondary education. This finding supports the literature of Finnegan (2000), noting that aviation must do a much better job of selling itself to the younger generation. He claims that if we do not attract kids by the time they are in high school, we will probably lose them completely. Kids are just not excited about aviation and the romance is not there anymore, whereas computers, e-commerce and the Internet are highly attractive careers for young people today. Fiorino (2000) supports this idea, noting that there used to be a mystique about working with airplanes, now the romance is in computer technology. He estimates general aviation has about 5-10 years to fix the Airframe and Powerplant mechanic problem before maintenance operations face a potential collapse. Money may not be the chief reason there are too few
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A & P mechanics, however. Fiorino believes the shortage exists chiefly because the industry has relied for too long on the romance of aviation and has done a poor job of recruiting people. Fiorino also notes that many maintenance executives are claiming that the shortfall is expected at two levels—the absolute numbers of A & Ps as well as skillsets, and that the shock wave will hit the airline sector within 3-5 years. Fiorino thinks that training and image makeovers are mandatory if airlines are to attract and retain a work force of airframe and powerplant mechanics with the critical skills needed to repair increasingly sophisticated aircraft.

**Recommendations**

*Launch a communications campaign to publicize career opportunities in aviation and to attract more women and minorities to the field.*

In order to encourage the participation of minorities and women in aviation, the researcher recognizes the need for early exposure to career opportunities in aviation. Both women and minorities became interested in aviation maintenance between the ages of 10 and 20 years old. This would indicate that primary school would be the age to begin targeting for the recruitment of both women and minorities into aviation maintenance. The attainment of equitable employment levels for all under-represented populations within the aviation industry depends on raising young people’s awareness of the diversity of occupational opportunities in the field of aviation. Moving toward greater representation of women and minority groups in aviation fields will necessitate additional efforts. In order to facilitate the flow of greater numbers of individuals from these groups into the nontraditional field of aviation, many barriers will have to be overcome.
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Launch a campaign to attract more women and minorities to the aviation career field. Aviation school populations may shift slowly to include more minorities and women, but they are still underrepresented in the aviation industry population. This condition persists because of a lack of efforts to recruit actively and financially assist these groups, beginning at the elementary school level.

Minority and female role modeling and career influences are important in encouraging women and minorities to pursue nontraditional career opportunities. Women employed in diverse areas of the aerospace industry have proven to be outstanding professionals. Nevertheless, female representation in various aviation career facets has remained disproportionately low. A number of long-standing obstacles have discouraged females from participation in this male-dominated industry.

While the FAA statistics showed the representation of females with active certificates and not the actual industry representation, female representation in the industry is disproportionately low except for traditional female roles in office and clerical positions. The imbalance between the number of men and women with certification required for employment in many facets of the aviation industry is likely to continue for many years. The reason for the perpetuation of this imbalance can be attributed to few females preparing for a nontraditional career in aviation.

Launch an awareness campaign to encourage barrier breakdown to attract more women and minorities into aviation. One barrier faced by females is the lack of encouragement to investigate or consider nontraditional careers. This lack of encouragement reinforces psychological and cultural barriers concerning nontraditional occupations and furthers the lack of information concerning these careers. As a result,
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relatively few minorities and females have sought the technical training required for
Federal Aviation Administration (FAA) certification, and, consequently, minorities and
females have lagged significantly behind white males in terms of eligibility for
employment in the aerospace field.

Breaking down barriers can lead to minorities and females being encouraged to
pursue an aviation career. Such encouragement would work in a direction that could
eventually increase the number of minorities and females participating in training
programs and seeking FAA certification. Increasing the numbers in training eventually
would result in a greater number of minorities and women qualified to pursue
professional careers in aviation. Increasing this number would help bring into balance
the sex inequity of the aviation work force and would assist in the gradual reduction of
the stereotypical barriers that presently exist.

*Launch a campaign to form mentor groups within professional aviation organizations.* Professional Aviation Organizations should implement a mentoring
program through which those holding certification can gain recognition for helping others
advance their careers through certification. A small step in that direction would be the
establishment of a means to track the role one plays in assisting the career development
of someone else and then recognizing those contributions.

Mentoring is a key step to managing cultural change within an organization and
creating an alignment with its values and strategic direction. The mentoring process links
existing and new programs in a manner that promotes overall professional growth
throughout the aviation industry (Galbraith & Cohen, 1995). The lack of mentors could
be offset by the recruitment of more minority faculty members. Schrieber (2001) notes
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that mentoring programs have proven to be highly effective in assuring the long-term success and retention of a diverse workforce. In such programs, Schrieber notes that established and successful executives agree to mentor younger employees of their own ethnic background. Schrieber recommends assigning majority and minority mentors to advise and assist minority employees in functioning successfully with members of the traditional workforce. Schrieber further recommends making successful mentoring a significant objective in performance appraisals.

*Launch in-service training programs for counselors, teachers, recruiters and administrators to encourage them to discuss aviation career options.* There is a significant lack of awareness and promotion of aviation career fields in elementary and secondary schools. Many secondary school students receive their first glimpse of their future career through their school counselors. This is particularly true for the less well-known occupations. Although certain aviation occupations, such as being a professional pilot, are relatively well-known and respected, counselors typically make little aviation career information available to students. The aviation maintenance profession is not only less well-known, it is also usually considered less attractive by persons with even a rudimentary knowledge of the air transportation industry. This lack of awareness and promotion of aviation may hinder student interest in an aviation career. This is particularly disadvantageous for minorities and women who may not have aviation role models. If these students are not aware of the attractiveness and rewards of an aviation career field, it is unlikely that they will gravitate toward it.

*Counselors, teachers, recruiters, and administrators need to be educated about the diversity of jobs in the aerospace industry and its various career options.* Lack of
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such information serves as a barrier to entry into such careers. Additionally, counselors, teachers, and recruiters need to encourage young women and minorities to consider nontraditional career options and need to help them in the investigation of these paths. In order to augment the participation of women and minorities in aviation careers, the researcher recognizes the need for early exposure to the opportunities in aviation.

This recommendation was founded on the finding generated by this study, which indicated that the population of women and minorities who took part in this research developed an interest in aviation by the time they were 20 years of age. Such a finding demonstrates the importance of making female and minority students aware of available career opportunities in aviation before they graduate from high school. This undertaking could be accomplished through good counseling techniques and exposure to representatives from aviation, and through programs using mentoring, job shadowing, and sponsorship. These programs would be effective because they unite potential aviation professionals with role models and introduce students to the career environment.

_Counselors, teachers, recruiters, and administrators should promote the investigation of nontraditional careers._ Such an investigation may work in a direction that could increase the number of women and minorities seeking nontraditional careers. This, in turn, may augment the participation of women and minorities in aviation maintenance training programs, thereby increasing the number of women and minorities pursuing a career in aviation maintenance. Increasing the number of women and minorities could help bring into balance the gender and ethnicity inequity of the aviation work force and assist in the reduction of stereotypical barriers that may still exist.
In order to shape a well-qualified, diverse pool of aviation maintenance professionals, all segments of the youth population must be exposed to opportunities in aviation maintenance. A number of career awareness activities may be utilized to provide the exposure young people need in order to make educated career choice decisions. Career awareness activities may range from short-term exposure events, such as field trips, to long-term activities, such as mentoring and internships.

The researcher feels strongly that this research effort constitutes only a beginning in the exploration of the complex issues associated with effecting equity in aviation as a career. As a beginning, it offers some limited insight into the problems associated with involving women and minority populations in pursuit of aviation as a career. The study, however, points out the need for further research of the complex issues surrounding the enigmatic problem of equity representation of all populations in the highly technical field of aviation.

**Recommendations for Further Research**

Recommendations for further research are offered, based on the findings and conclusions of this study. Because there were a number of limitations associated with this study, the researcher has several specific recommendations to others who may wish to replicate this effort. *First*, this study included only 43 participants. The researcher believes that an increase in the number of respondents would serve to increase the validity and significance of the findings. *Second*, the study was confined to those schools located within states having large populations of minorities. The results produced may be tainted by cultural and social-economic constraints of those states. The researcher feels that the inclusion of all schools from all regions within the United States would assist in
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the removal of such constraints. Finally, the survey population included women and minority instructors teaching at aviation maintenance technician schools. The applicability of the results may be limited to the specific areas studied. The researcher believes that expanding the study to include additional, or all, facets of aviation training would best represent women and minorities involved in aviation careers.

This researcher hopes that the findings of this study will make a contribution to institutional management for institutions offering aviation training.
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References


