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**Faculty and Administrator
Credentials in FAA Part 147
Airframe and Powerplant Programs**

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About the Council

ATEC was founded in 1961. Its mission is to promote and support aviation maintenance technical education.

The council actively engages with regulatory and legislative bodies to advocate on behalf of the community, and provides resources, continuing education, and networking opportunities for our members.

Our membership is made up of employers, vendors, and educational institutions with aviation technical programs. The vast majority of member schools are certificated by the FAA to provide aviation mechanic programs.

Membership supports the following activities and initiatives—

- Advocating for sound regulatory policy, the development of clear and concise guidance, and consistent enforcement and application
- Participating on industry and agency committees to further aviation technical education and workforce development
- Fostering and supporting career pipeline partnerships between industry and educational institutions
- Facilitating networking opportunities through the annual conference, Washington fly-in, regional outreach meetings, and virtual webinars
- Enhancing aviation technical career awareness through support of ATEC's sister organization, Choose Aerospace

About the Journal

The *ATEC Journal* (ISSN 1068-5901) is a peer-reviewed, biannual electronic publication. The publication provides an opportunity for educators, administrators, students and industry personnel to share teaching techniques and research. Authors are encouraged to submit their articles for publication consideration, whether scholarly, research, application, or opinion, by using the submission form below. Papers supporting the council's regulatory and legislative agenda may be considered for presentation via online webinar and at the annual conference. Suggested topics include:

- Technical and soft-skills curriculum integration
- A history of legislative actions affecting aviation maintenance workforce development
- A study on implementing employer-education partnerships
- Funding implications stemming from Bureau of Labor Statistics occupational outlooks
- Highlighted innovations in the aviation maintenance industry
- A look at successful online teaching methods and subject matter in other technical fields
- Surveying currently used computer-based teaching across aviation maintenance training schools

SUBMISSION DEADLINES

Fall Issue Closing Date: October 1 • Spring Issue Closing Date: May 1

SUBMIT AN ARTICLE FOR REVIEW AT ATEC-AMT.ORG/THE-JOURNAL.HTML

from the EDITOR



Thank you for your continued support and interest in ATEC and its members' research pursuits. We hope you find this issue of the ATEC Journal to be applicable to your program's goals. Tracy Yother, Ph.D., Mary Johnson, Ph.D. and Seongjun Ha from Purdue University's School of Aviation and Transportation Technology present their findings regarding a survey of AMTS faculty needs to support the increased industry demand for qualified technician graduates. This timely research aligns with all our AMT programs' efforts to maintain sufficient pipelines into the aviation maintenance workforce.

I look forward to hearing more from you, my fellow AMTS instructors, about your research focuses for the next ATEC Journal issue. I hope you consider writing a research article or an opinion piece to keep the dialogue flowing towards future improvements in our niche of academia and training.

As always, many thanks to the members of the Editorial Board who work hard to support this Journal. I appreciate all of your efforts.

Best,

Karen Jo Johnson, Ph.D.

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Committee Updates

Committee membership is open to all individuals employed at ATEC member organizations. Explore initiatives below and get involved! Email atec@atec-amt.org to join a committee.

MEMBERSHIP COMMITTEE

It's that time of the year—membership renewal season! ATEC's initiatives are powered by member dues and the dedication of our active and engaged community. This year, an impressive 156 out of 199 part 147 schools (nearly 80% of all certificated programs) were proud members of ATEC, joined by 98 organizations representing non-certificated educational institutions and industry. The 2023 membership roster reached an all-time high for the sixth consecutive year.

With our community expanding, exciting new member benefits are on the horizon. In 2024, we'll introduce a cutting-edge association management system, offering enhanced access to the member directory and high school aviation maintenance programs, among other features. Stay tuned for official announcements and login instructions.



JAMES SMITH
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MEETING PLANNING COMMITTEE

Counting down the months until we welcome you to Tucson! Registration will open soon, and the conference agenda will be unveiled next month. Beyond informative sessions and delightful food, we're eager to showcase our city, including the Pima Community College Aviation Center, the Tucson Air & Space Museum, and our presenting sponsor's facility, Bombardier. Have a topic you'd like to share with the community? Respond to the call for presentations by emailing ATEC Executive Director Crystal Maguire.

Mark your calendars for March 17-20, and be on the lookout for registration details.



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LEGISLATIVE COMMITTEE

After over a year of engagement with elected officials and a highly successful ATEC Fly-in, Congress is on the verge of finalizing a deal to advance comprehensive legislation reauthorizing the Federal Aviation Administration before the year-end deadline. This landmark bill is expected to address every one of ATEC's legislative priorities, including expanding the FAA workforce development grant, improving the airman certification standard system, and creating dedicated pathways for exiting military personnel.

Committee members are eager to brief you on the law's implementation and how you can contribute during a breakout session at the ATEC Annual Conference. We can't wait to see you there.



JARED BRITT
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REGULATORY COMMITTEE

Following a successful and relatively uneventful first year under the new part 147, the council is turning its attention to new regulatory priorities. This includes enhancing the new testing system, proposing changes to the airman certification standards (ACS), and broadening access to mechanic testing. In the upcoming year, the committee will extensively comment on and recommend changes to the next 8083 series handbook revision, scheduled for publication in June 2024 (general) and 2026 (airframe and powerplant).

Learn more about these initiatives and other regulatory priorities at www.atec-amt.org/regulatory.html.



SEAN GALLAGAN
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CHOOSE AEROSPACE

The Foundation, designed to support new talent pipelines into the industry and part 147 programs, is now well into its second academic year. Across the country, 400 students are enrolled in Choose Aerospace general aviation maintenance programs at high schools, part 147 programs, and community-based organizations. In the coming year, Choose Aerospace will focus on ensuring each student has a clear pathway to an aviation career—either through a part 147 school or direct employment.

We're thrilled to announce Kelly Filgo as the new Choose Aerospace Director of Operations. With multiple terms on the ATEC board and over a decade of experience as an instructor and administrator of a part 147 program, Kelly will serve as the primary liaison between ATEC members and Choose Aerospace high schools. Please engage with Kelly to explore how you can leverage the Choose Aerospace network to build direct pipelines into your school and company.



RYAN GOERTZEN
CHOOSE AEROSPACE PRESIDENT

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ATEC CALL FOR PRESENTATIONS

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Faculty and Administrator Credentials in FAA Part 147 Airframe and Powerplant Programs

BY **TRACY L. YOTHER, PH.D.** is an assistant professor at Purdue University's School of Aviation and Transportation Technology. Her research areas are curriculum development in aviation maintenance programs including a focus on new technologies such as electric propulsion. She holds an FAA Airframe & Powerplant (A&P) license.

MARY E. JOHNSON, PH.D. is professor and associate head for graduate studies and research at Purdue University's School of Aviation and Transportation Technology. Her research areas are data-driven approaches to aviation sustainability, technology implementation, and aviation safety improvements.

SEONGJUN HA is a Ph.D. student in Aviation technology in the School of Aviation and Transportation Technology (SATT) at Purdue University, West Lafayette, Indiana. He earned his MS in Aviation and Aerospace Management at Purdue University, a BS in Aviation Technologies at Southern Illinois University - Carbondale, and an A.S.S in Aviation maintenance at Idaho State University. He holds FAA Airframe & Powerplant (A&P) licenses and a Remote Pilot license.

ABSTRACT

In July 2022, the *Boeing Pilot and Technician Outlook 2022-2041* forecasted a need for 610,000 new aircraft technicians as worldwide commercial fleet operators, maintenance, repair, and overhaul providers during the next two decades. This total forecast includes 134,000 new technicians needed to serve the commercial aviation sector in North America. Increasing the number of students in maintenance training programs is one part of the solution. However, to meet the needs of an increased number of students, there may be an associated increase in the number of new faculty and administrators in Aviation Maintenance

Technicians Schools (AMTS). The number of expected position openings and the education and experience requirements for AMTS faculty and administrator positions are not well understood. The purpose of this research is to gain insights from current AMTS into the number of expected new positions and the requirements of future faculty and administrators. In this study, information from directors at 58 AMTS were directly surveyed with a 26 percent response rate. Results from this study may be used to help build a pipeline for future faculty and program administrators.

The shortage of aviation maintenance technicians is not a new phenomenon. Discussion on the shortage of mechanics reaches back to at least the early 1990s (George, 1990; “Pilot and Mechanic,” 1992; Shepherd, 1992). Boeing (2022) forecasts 610,000 and Airbus (2022) forecasts more than 700,000 new aviation technicians between 2022 and 2041. A demand for new aviation maintenance technicians of this magnitude has multiple contributing factors including accelerated retirements during the pandemic and not enough entrants to the aviation maintenance industry. To meet the industry workforce gap, we recommend increasing the number of students entering and completing technician programs at Aviation Maintenance Technicians Schools (AMTS). To meet this increased number of students, additional faculty members may be required. The goal of this paper is to gain insights into future faculty needs and educational requirements in the AMTS programs.

Literature Review

Collegiate AMTS Faculty Qualifications

High-quality faculty are crucial to fostering high-quality aviation education programs (Kuhns, 1995). High-quality teaching and learning settings are needed to meet the needs of new students (Boeing, 2022). The Higher Learning Commission defines high-quality faculty as:

A faculty member’s ability to understand and convey the essentials of the discipline that a student should master at various course and program levels. Qualified faculty should be able to engage professionally with colleagues in determining the specific, stated learning objectives for all graduates of a specific program as well as process the full scope of knowledge, skill, and dispositions appropriate to the degree awarded (Higher Learning Commission, 2014, p. 2).

To become an AMTS maintenance faculty member, individuals must meet institutional requirements, accrediting body requirements, and hold an airframe or powerplant certificate (or both) for the appropriate teaching subject area (FAA, 2015; Johnson, 1999; Motevalli, Johnson, & Thom, 2017). The qualifications of faculty members must support the program mission and be demonstrated through their aviation experience, certifications, professional development, and teaching ability (White, Kroes, & Watson, 2000).

Collegiate AMTS Challenges

Kuhns (1995) pointed out that increasing the number of aviation faculty is a way to improve the aviation program learning setting. The *2022 Aviation Technician Education Council (ATEC) Pipeline Report* found that more than 40 percent of respondents indicated that hiring adequate faculty is a barrier for program growth (ATEC, 2022). Some of the barriers include minimum qualifications beyond collegiate degrees, certification requirements, industry experience, and previous teaching experiences (Johnson, 1999).

Collegiate AMTS Faculty Needs

Motevalli et al. (2017) reported survey responses about faculty hiring plans from 30 two-year AMTS indicating that they expected to hire 67 faculty positions for a short-term plan (1 to 3 years), and 96 faculty positions for a long-term plan (4 to 10 years). When respondents indicated the preferred degree for their faculty position openings for 2016-2025, the respondents expected to fill 77 percent of the estimated 136 new positions with degree-holders (39 certificate-only, 93 associate's, 30 bachelor's, and two master's degree holders) (Motevalli, et al., 2017). An earlier study with 56 respondent public and private AMTS reported that 42.8 percent were hiring, and that the most prevalent minimum requirement for positions open at these institutions was a master's degree at 63 percent (Johnson, 1999).

Problem Statement and Research Questions

Even with AMTS plans for expanding their programs in the next few years, one hurdle is hiring and retaining a sufficient number of qualified faculty (ATEC, 2022). In this study, we assume all ATMS have both a preferred and a required level of education when they anticipate hiring new faculty or program administrators. The goal of the study is to gain insight into the program faculty hiring plans, level of degree required or preferred, and other qualifications that meet the regulations at Title 14 of the *Code of Federal Regulations* Part 147. We did this by distributing

questionnaires to AMTS faculty and administrators or program heads and analyzing their responses using qualitative and quantitative methods.

The research questions are:

1. When hiring a new administrator, what are the preferred and required levels of education?
2. How many faculty are you planning to hire in the future, and what are the preferred and required levels of education?

Method of Data Collection

Dataset of Schools from FAA

We targeted all the collegiate and noncollegiate Federal Aviation Administration (FAA)-approved Part 147 AMTS found on the FAA website (FAA, n.d.). We obtained program leaders' names and contact information from the schools' websites. The search for program leaders was delimited by searching on these, or similar, keywords: "AMTS program coordinator/director/faculty," and "department head/chair/dean." We were able to collect the contact information for 58 program leaders from 57 AMTS.

Survey Design

We generated a 23-question survey regarding the preferred and required levels of qualifications for future AMTS faculty from the program head or chair's perspective. The survey was prepared using Qualtrics®, commercially available, web-based survey software. The expected survey completion time was 20 to 30 minutes. We received approval from the Institutional Review Board (IRB) for human subjects research (IRB-2021-1306). We distributed the survey to 58 AMTS program leaders in May 2022. The data were collected in May 2022.

Results

The overall response rate for the survey was 26 percent with 15 respondents out of 58. Some participants did not answer all the questions. On the question of the primary role of the person who responded to the survey, only 14 of the 17 answered. Seven of the 14 (50 percent) respondents were program heads/administrators. Five (36 percent) were faculty. One respondent (7 percent) was the Dean of the School, and one (7 percent) preferred not to answer.

When questioned on the type of program at their school, the majority (64 percent) of respondents were 2-year AMTS that offered an associate's degree. Four (28 percent) of the programs offered only airframe and powerplant (A&P) certificates with no degree. One respondent preferred not to answer.

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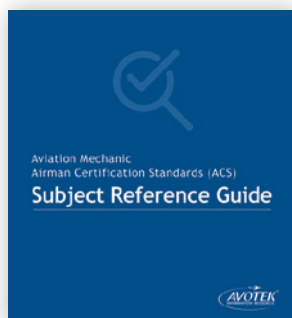
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Administrators

Fourteen respondents reported the level of education of their current program administrator. Two (14 percent) current program administrators hold an associate degree. Three (21 percent) hold a bachelor's degree. One (7 percent) has a high school diploma or GED. Six (42 percent) have a master's degree. Two (14 percent) preferred not to answer.

We asked if the AMTS seeks to hire a new administrator or program head in the next 5 years, if so, what would likely be the highest degree required for the position and what would be the preferred level of education (see Figure 1). There were 13 respondents for both questions. The highest response for the required degree level were a bachelor's degree (38 percent), but the highest response for the preferred level was a master's degree (54 percent). Two (15 percent) respondents preferred not to answer.

Faculty

We asked respondents to provide information on their program's certificated faculty both currently and future hiring needs. Of the 10 responding AMTS there were 48 full-time faculty and 32 part-time faculty that are A&P certificate holders. When it comes to expected hiring needs, we can see there is an incongruity between the number of faculty that are needed to support current aviation maintenance programs and the number of faculty that are expected to be hired in the next 3 years. Figure 2 shows the comparison of the number of A&P certificated faculty the program needs against hiring expectations at two different time intervals: 0 to 3 years and 3 to 10 years. All of the 17 AMTS that responded to any survey question are included in this chart individually identified as schools A, B, C, ... Q. If there was no response for the hiring needs questions, the response was coded as a zero. Although some schools are expecting to hire the number of faculty needed, in other cases they are not and might leave the program understaffed for their expected student demand.

When asked how many additional A&P certificated faculty are needed to support their current program: 9 AMTS (n = 4) responded with a need to hire an additional 17 faculty within the next 3 years, and 5 AMTS (n = 5) expect to hire 9 faculty in the 3-to-10-year timeframe.

The data shows that the short-term and long-term requirements of the faculty hiring plan are high school diploma holders. Respondents were also asked to indicate the education level of A&P faculty hired in the next 0 to 3 years and 3 to 10 years. The questions were for both the required level of education and the preferred level of education. Respondents also provided the number of faculty they expected to hire at that education level (Table 1).

Figure 1

Level of Education for New Administrator in Next Five Years

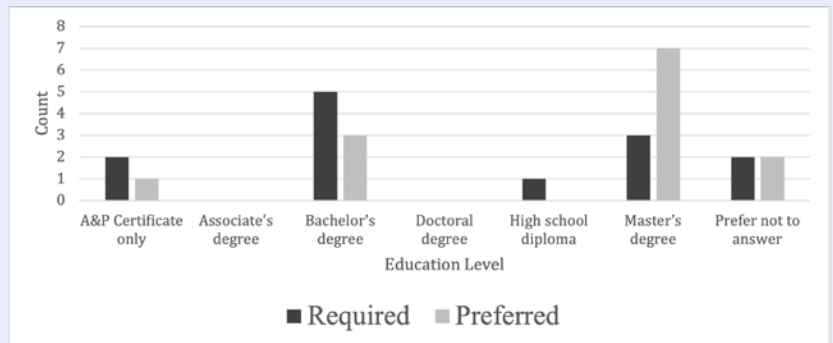
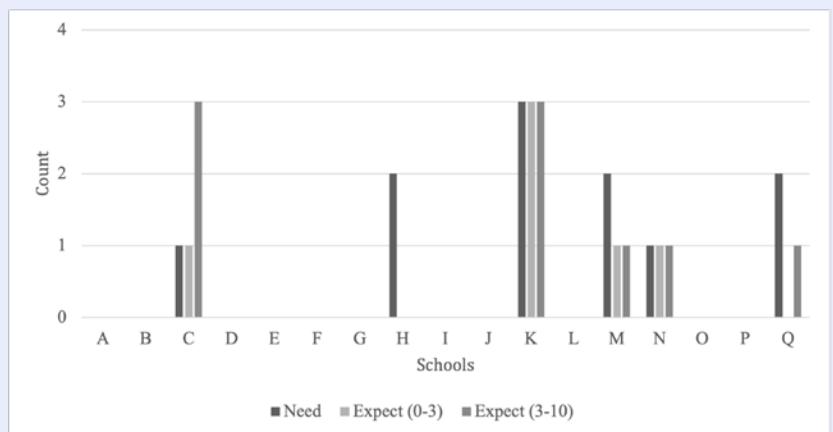


Figure 2

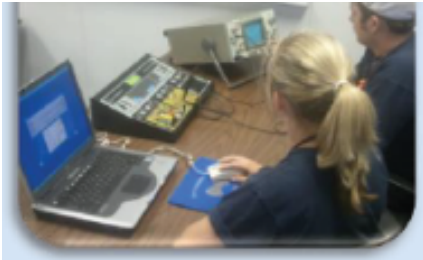
Comparison of Current Full-Time Faculty Needed vs Expected to Hire in 0-3 Years and 3-10 Years





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Table 1

Minimum Education Level and Number of A&P Faculty to be Hired over 0-3 Years and 3-10 Years (n = number of AMTS respondents)

Years		n	High school or GED diploma	Associate's degree	Bachelor's degree	Master's degree	Doctoral degree
0-3	Required	8	11	3	2	0	0
	Preferred	8	1	1	15	0	0
3-10	Required	7	13	2	4	0	0
	Preferred	6	1	0	18	0	0

Discussion

From these responses, we identified that generally the required level of education for administrators is a bachelor's degree, but the preferred level is a master's degree. Concerning the hiring of A&P certificated faculty positions, there were 5 AMTS that expect to hire 15 additional faculty over the next 10 years. With this hiring expectation, we anticipate that increased AMTS faculty recruitment will continue to be required over the next 10 years to meet the anticipated demand for graduates. Except for school C, there is no difference in the recruitment plans for AMTS faculty between long-term (3 to 10 years) and short-term (0 to 3 years). The survey did not ask what might be the difference between the short and long term. The respondents prefer hiring faculty who hold bachelor's degrees but are open to those who hold high school diplomas and certificates. None of the schools who responded intend to hire faculty who hold master's or doctoral degrees.

Conclusion

The aviation industry has identified the aircraft technician workforce shortage both now and in the future. To reduce this shortage, we reached out to AMTS programs for the short-term and long-term hiring needs and education requirements for faculty and administrators. The results show that there is a gap between the number of faculty needed to support programs versus the number of faculty programs are expected to hire. Six participating AMTS identified the need for 11 additional faculty, but expected to hire only 6 within the next 3 years. Additionally, the results identify education requirements for faculty (high school required; bachelor's degree preferred) and administrators (bachelor's degree required; master's degree preferred). Information in this study may be useful as the foundation for filling the gap in the number of needed A&P technicians by moving closer to establishing an industry-consistent baseline for faculty and administrator requirements. Additionally, the data may provide a guide for focusing future recruitment efforts.



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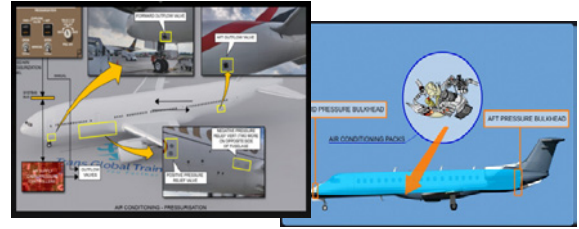
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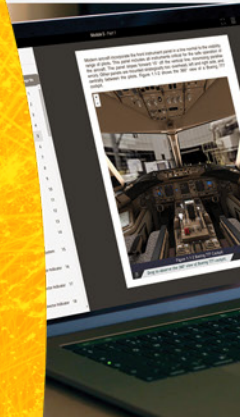
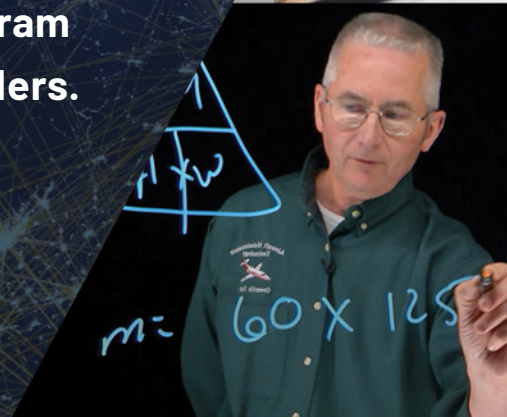
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ATEC is the voice of aviation technician education, its regulatory and legislative advocacy advances an industry-focused workforce agenda. Membership supports the community's efforts to educate leaders on Capitol Hill and engage with regulators at the Federal Aviation Administration, the Department of Education, and the Department of Labor.

INFORMATION

Regular news updates ensure you are always in the know. Membership also supports publication of the *ATEC Journal*, a compilation of peer-reviewed papers on teaching techniques and research, and the *Pipeline Report*, an annual account of trends in workforce development.

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ATEC member dues support the day-to-day management of **Choose Aerospace**, a nonprofit organization that promotes aviation careers through marketing, curriculum development, and coalition building. Learn more at chooseaerospace.org.

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Join a community. At the Annual Conference, Washington Fly-in, and regional meetings, members take advantage of discounted rates to network with peers and hear directly from leaders on important issues. Members have access to the annual school directory—a compilation of information on aviation programs—so educators can share ideas and employers can target recruitment activities. Limited information from the member directory is available to the public through our online school directory.

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