

Winter 1994

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Rollo, V. F. (1994). Postsecondary Aviation Programs in the United States: 1950 and 1985. *Journal of Aviation/Aerospace Education & Research*, 4(2). <https://doi.org/10.15394/jaaer.1994.1124>

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***POSTSECONDARY AVIATION PROGRAMS IN THE UNITED STATES:
1950 AND 1985***

Vera Foster Rollo

This study examined aviation programs in accredited postsecondary institutions in the United States for the years 1950 and 1985.

The goals were to compare schools with aviation programs in operation in 1985 with those in operation in 1950 to determine what changes had occurred; and then, to investigate what influences and pressures had caused those changes. If an increase or a decrease in aviation programs offered was discovered, then reasons would be sought to explain this increase or decrease.

SUMMARY OF DATA

It was found that a greater number of institutions, and a higher proportion of all postsecondary institutions, offered aviation programs by 1985. In 1950 there were 223 schools, according to Jackson, amounting to 12 percent of postsecondary institutions. Jackson studied a substantial number of institutions with aviation programs. The American Council on Education, in a 1948 survey, counted 372 postsecondary institutions with aviation programs of some sort. By 1985 there were 565 such schools, or 17 percent of the total number of accredited postsecondary institutions. This figure of 565 does not count as additional programs the 137 Community College of the Air Force branches or the 80 Embry-Riddle Aeronautical University branches.

Also noted was a marked change in the kind of aviation offerings in the increased number of degree programs available by 1985. There were 1,187 degree programs in more than 565 institutions; in 1950 there had been only 184 programs offered in 223 schools.

A change in program focus has occurred. Jackson (1950) found degree programs, dominated by aeronautical engineering courses, making up 125 out of a total of 184 degrees offered. In 1985 flight technology led in number of degrees with 316 offered, plus 92 courses and certificates. Maintenance technology followed with 204 degrees offered, and 42 certificates with credit available. Aerospace engineering was still strong, however, with 185 degrees available.

Among the degrees available in 1985 were: 171 in

Aviation Management, and 197 miscellaneous degrees offered in Air Traffic Control, Aviation Education, Avionics, Computer Technology for Aviation, Electronics in Aviation, Flight Attendant, and 16 other programs.

Postsecondary schools that in 1950 had strong aviation programs tended to retain and expand them by 1985. Those with slight offerings (just a few courses for pilots' ground school) tended to drop aviation programs.

Air Force Reserve Officer Training Corps' (AFROTC) Bachelor of Science degrees are now available at 151 four-year, host institutions. The AFROTC has changed; despite a drop in enrollment from 45,000 students in 1950 to 20,000 students in 1985, AFROTC was by 1985 available at a higher percentage of colleges. That is, it was available at 78 colleges in 1950; and by 1985 it was available at 151 host postsecondary schools with an additional 641 institutions linked by enrollment "cross town" agreements.

Air Force officials state that "The AFROTC is the largest source of commissioned officers for the Air Force" (personal communication, August 4, 1989).

AFROTC programs are quite persistent. Schools having AFROTC in 1950 continued to offer AFROTC in 1985 in an overwhelming majority of cases. It should be noted that only four-year institutions are AFROTC "host schools," where the AFROTC classrooms are located.

It is essential to look at the overall postsecondary statistical view to understand just what these data mean. For example, changes in postsecondary education itself

have occurred. The number of accredited postsecondary institutions has increased from 1,863 in 1950 to 3,301 in 1985. A tremendous expansion is found, too, in enrollment, from 2.3 million students in 1950 to 12.2 million students in 1985. Even conceding the increase in U.S. population from 151.7 million to 238.7 million, it is obvious that the proportion of students attending colleges and universities has vastly increased over the period investigated in this study.

Another background factor to consider is the explosive growth of aviation from 1950 to 1985. Airports increased from 6,403 to 16,075. Active pilots increased from 523,174 to 722,376; specifically, airline transport pilots have increased from 9,023 to 79,192, a trend of interest to aerospace postsecondary educators.

Still looking at the background of aviation, comparing the years 1950 and 1985, airline revenue enplaned passengers increased from about 17.4 million to almost 362 million. In domestic flight, passenger miles flown rose from 10 billion to 243 billion. The technological revolution since World War II has prompted transoceanic passengers to shift from ocean liners to airliners. Today, most first-class, intercity mail travels by air, as does much international mail. Air transport has arrived and continues to grow.

The nation's military-service academies have changed. In 1950 these institutions focused on military technical subjects. They were military trade schools. By 1985, however, all of the service academies had formal degree programs and were members of regional accreditation associations. Also, all of the service postsecondary schools except the Coast Guard Academy now offer aviation studies.

Again looking at the big picture to gain background and place data in context, it is seen that although the United States has been mainly at peace since 1950, the number of military personnel on active duty grew from approximately 1.5 million in 1950 to 2.2 million in 1985.

All of the services now encourage formal postsecondary education. In looking specifically at those military services involved in aviation, this study found that the Community College of the Air Force (CCAF) is an example of the trend toward formal education. The CCAF is an accredited institution offering two-year

programs leading to degrees. It is, indeed, the world's largest two-year institution, with an enrollment of 300,000 Air Force enlisted personnel. The CCAF contracts with civil colleges in many instances to provide classes in a variety of subjects.

The United States Army Aviation Center at Fort Rucker, Alabama, is another military school that began as a technical training institution but today offers degrees ranging from Associate through Master's.

That the military is convinced of the value of graduate study in aviation is proven by the work of the Air Force Institute of Technology, the Air Force's graduate school. Also, the military academies have formal degree programs in aviation; that is, the U.S. Military Academy at West Point, the U.S. Air Force Academy in Colorado, and the U.S. Naval Academy in Maryland.

Like the military academies, civil postsecondary institutions have formalized aviation training. Many examples of this trend were found. The venerable Parks flying school is now Parks College, affiliated with St. Louis University; the noted Embry-Riddle flying school is now Embry-Riddle Aeronautical University, with many formal degree courses and graduate programs. A similar evolution has occurred in many flying schools that changed to formal, accredited postsecondary institutions. For example, the Sierra Academy of Aeronautics is now affiliated with the Golden Gate University of Washington State. The Florida Institute of Technology is a thriving postsecondary institution. Middle Tennessee State University (a degree-granting institution to start with) has continued and expanded its aviation programs. Similarly, Tuskegee University, which had only Civil Pilot Training during World War II, today offers formal degrees in aerospace studies. These are only a few of the civil institutions that have formalized and/or expanded their aviation programs since 1950.

METHODOLOGY

Aviation programs were defined as any aviation courses offered in a postsecondary institution. The literature on academic examinations of postsecondary institutions and their aviation programs is scanty. The Jackson work cited above and that by Schukert (1976) were of great value. There were also a number of

Postsecondary Aviation Programs in the United States

dissertations on military aviation and on aeronautical engineering subjects at the postsecondary level. Other histories and publications on aviation in colleges and universities were consulted.

Officials of postsecondary institutions, military personnel, and Federal Aviation Administration officials were interviewed. Letters were written to obtain information to round out the study. All these investigative instruments are listed in the Appendix section of the dissertation.

Directories of aviation colleges and programs were used to compile a 40-page listing of postsecondary institutions with degrees and programs offered in 1985 and 1950. Using this research document, programs were compared for these two years. Also used were U.S. statistical abstracts, FAA publications, Aerospace Industries Association of America statistical guides, and the directories and publications of the University Aviation Association and other publishers.

Catalogs from all the military academies and from civil postsecondary schools were obtained for study. Letters and interviews were used to get information on military ROTC.

Most useful was a survey instrument sent to 250 members of the UAA, an association of colleges and universities with 350 members. Respondents were prompt and contributed substantial information about aviation programs at their schools. Also, respondents gave their perceptions of what pressures and influences caused aviation programs to flourish or to decline. These views were of particular value.

INFLUENCES AND PRESSURES

Why have aviation offerings proliferated in the nation's postsecondary schools? Why have both civil and military schools largely evolved into formal, accredited, degree-granting academic institutions? It might be expected that flying training, aviation-related training, would remain at the trade school or even the grass-runways level in the United States. That it has not indicates a strong confidence in the worth of postsecondary education on the part of aviation officials, civil employers, and military officials. This perception was shared by many of the respondents to the survey instrument.

MONEY AND PERCEPTIONS

In general, three answers were given to explain why aviation programs are offered:

1. Funding. Government money, both military and civil, supports a great number of programs in one way or another. To a lesser degree so does industry funding, as airlines seek college-trained personnel, including pilots. The trend is for aeronautical corporations to seek accredited institutions to assist with training.

2. Perception. Americans have been very much convinced of the desirability of a college education. Students see it as a path of advancement. Employers see a college-trained person as a desirable employee (Schukert, 1976).

3. Historical factors are also at work in aviation and in the nation, as will be discussed.

The influences of these three factors—available funding, perceptions of the aviation community, and historical factors—are outlined below.

FUNDING

Both the federal government and the aviation industry seek the aid of universities and colleges, this study found, as government and industry try to deal with an increasing shortage of adequately educated personnel for today's increasingly technical careers. For example, the FAA operated a training facility at Cameron University in Lawton, Okla. Each year 3,300 FAA employees attended classes there. The FAA also gives funds to Airway Science programs in civil postsecondary institutions for buildings and equipment.

As mentioned previously, the military turns to civil colleges for Air Force (and Navy and Army) ROTC programs, for CCAF classes, and for post-graduate work financed by the military. These programs are apart from the formal education taking place at the purely military postsecondary schools.

U.S. airlines have a few programs at the postsecondary level.

HISTORICAL INFLUENCES

The third factor in explaining why postsecondary institutions have chosen to offer aviation programs, is the influence of historical events. Increasingly, history shows that civil federal, military, and civil aviation industry organizations have turned to the nation's

postsecondary schools for education in aviation programs.

Early in aviation's history, colleges and universities began to train aeronautical engineers. World War I spurred aviation to mature technologically. World events exerted pressures on aviation which were later to surface in college aviation studies.

In the late 1930s, before World War II, the Civilian Pilot Training (CPT) programs were placed in postsecondary schools. This program (later called the War Training Service) was set up in 664 colleges in the United States to train a pool of pilots. By 1940 there were 1,708 degree-conferring institutions involved in CPT.

The CPT program used a clearly defined curriculum of classroom and flight training. It succeeded in standardizing ground and flight training on a national scale. The program formed a link between flight training and postsecondary education that had not been there before. It standardized flight-training curricula to a considerable extent as well.

After World War II another federally funded program, the first G.I. Bill, was to have a great impact on flight training and other aviation career training. True, the legislation did not specify that students applying for flight training must attend an accredited college or university. Many spent their G.I. Bill funds at certified flight schools. But many used their benefits at accredited postsecondary schools.

Today there is a new G.I. Bill, created by the Montgomery G.I. Bill Act of 1984. Increasingly, federal legislation has exerted pressure for the student to attend a formal, accredited college or university. The 1984 bill, with amendments passed in 1987, continues indefinitely. This open-ended authorization for career training for military veterans is a boon for many postsecondary schools and, of course, includes those with aviation programs. In 1989 still another federal law was passed expanding the scope of veterans' benefits.

The goals of the G.I. Bills agree with the previous contention that there is a perception that college-trained personnel advance more rapidly than those lacking that education. One stated goal of the legislation is to help veterans return to civilian life successfully. The

legislation also encourages active military personnel to attend college and is designed to help the military retain personnel through generous educational benefits. Certainly historic, too, is the effect of the G.I. Bill in making a college education available to thousands of veterans.

World War II itself is a historical factor in that thousands of pilots were trained and given extensive experience in complex aircraft. By 1985 these pilots and many other trained aviation people were reaching retirement age. Suddenly the need arose to replace these thousands of people just as the air transport business was booming.

A recent historical development is the use of postsecondary schools by a few airlines to train personnel, as mentioned previously. Some use trainees with no flight training and give complete pilot-training programs.

An interesting and possibly an influential development is the Airway Science program. Following the Professional Air Traffic Controllers' strike in 1981, the FAA expressed a strong interest in improving the educational credentials of thousands of key technical personnel. This interest evolved into work done by the FAA and the UAA, who designed college curricula for degrees in five specific areas. These areas are Airway Science Management, Airway Computer Science, Aircraft Systems Management, Airway Electronic Systems, and Aviation Maintenance Management.

The Airway Science program may serve as a model for aviation programs in colleges and universities in the future. This remains to be seen.

Recent events, such as the Persian Gulf War, have affected the business of air transport. The public postponed travel plans for fear of terrorist activity and, as a result, airline personnel cutbacks were made. Historical influences, too, can certainly be seen in the end of the Cold War with Russia; probable results are a reduction in U.S. military personnel and an increase in air transport to Russia. These events were not a part of the comparative study, but serve as an additional comment on how historical influences can affect the aviation industry and eventually aviation programs in postsecondary institutions.

Postsecondary Aviation Programs in the United States

SUMMARY

We see that aviation programs in the nation's postsecondary schools have grown in number and in scope. Many more degrees and a larger variety of degrees in aviation are available today. A higher percentage of all United States postsecondary institutions offer aviation programs.

The pressures to include aviation programs in curricula are: (a) the availability of federal military and civil funds for programs; (b) the perception by both students and employers that college-trained personnel are desirable in the industry; and (c) the influences of historical events on aviation.□

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