

ARTICULATION OF AVIATION EDUCATION  
PROGRAMS AMONG OKLAHOMA COLLEGES  
AND UNIVERSITIES

By

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## CHAPTER I

### INTRODUCTION

#### Background of the Study

Higher education existed in Oklahoma long before it became a state in 1907. Colleges in Oklahoma date back to 1880 when Bacone College was founded, and into the 1890s when the University of Oklahoma and what is now Oklahoma State University began. This was long before man's first powered flight on December 17, 1903, by the Wright brothers at Kitty Hawk, North Carolina.

Aviation began in Oklahoma in 1910 and airplanes appeared at various places around the state during the next few years. ("Willard to Cut," 1910). In 1911, Clyde Cessna first saw an airplane at an airshow in Oklahoma City and was so stirred that he returned home to Enid, Oklahoma, and built one. After several attempts and numerous modifications, he successfully flew his airplane in May, 1911. ("Cessna Integrated," 1974). That same year, enthusiasts built an airplane in the Nichols Brothers Bicycle Shop in Chickasha and flew it on June 24th. In 1913, Wiley Post first saw an airplane at the county fair in Lawton, Oklahoma. (Post, 1931). By the summer of 1919,

ubiquitous barnstormers thrilled spectators throughout the state with daring maneuvers, including parachute jumps.

(McGowan, 1974).

As the United States prepared for war in the late 1930s, colleges became an important part of flight training under the Civilian Pilot Training Program initiated by Congress in 1939. Under this program, Oklahoma colleges and universities taught many pilots to fly as the nation prepared for and entered World War II. Following World War II, Oklahoma colleges and universities provided aviation courses and programs for many returning veterans. Later, a few higher education institutions offered aviation programs but most of the flight training shifted to non-college flight schools during the mid-twentieth century. Once again many colleges and universities are now offering aviation programs.

#### Background of the Problem

As of Fall, 1990, 22 of the 47 colleges and universities in Oklahoma offered at least one aviation course. Six institutions offered aviation programs leading to associate degrees, and six had baccalaureate aviation programs. The programs varied greatly from no flight training - to those producing commercial pilots and flight instructors - to programs in aviation management - to airport management.

The advantages to students who might efficiently transfer from a college with low-cost flight training to a university with an aviation baccalaureate program are obvious. For example, the tuition cost of lower-division courses at Oklahoma two-year colleges in the fall of 1990 was \$27.30 per hour versus \$47.05 per hour at Oklahoma four-year institutions. The tuition savings alone would amount to \$296.25 per semester. The flight training costs might be less as well. For example, the cost for flight instruction and airplane rental for training through the commercial pilot certificate with an instrument rating at one two-year college was \$6,340 versus \$10,250 at a four-year university.

Oklahoma colleges and universities were challenged to enhance academic excellence and efficiency through strategic planning and a series of meetings between the 19 higher education governing boards and the Oklahoma State Regents for Higher Education during the first four months of 1990. (Brisch, 1990). From these meetings, an 18-point "Program for Academic Excellence and Efficiency" was developed for consideration by the governing boards before the State Regents held public hearings in the fall of 1990. (Brisch, 1990).

Point number 10 of the "Program for Academic Excellence and Efficiency" was entitled, "NEGOTIATED COURSE-BY-COURSE ARTICULATION." (Brisch, 1990, #10). This point included a

statement, "Given the increased student mobility and enhanced opportunity for success, additional steps should be taken to remove potential penalties, enhance transfer, and better assure uninterrupted student success. The current articulation policy should be revised to provide greater assurances of success through a course - by - course articulation arrangement." (Brisch, 1990, #10).

Point number 13 was also related to articulation and is entitled, "IMPROVE COURSE AND PROGRAM TITLES FOR BETTER IMPLEMENTATION OF ACADEMIC GOALS." (Brisch, 1990, #13). In part, this point stated, ". . . an accurate and uniform inventory of courses and programs authorized by the State Regents at each institution should be established to facilitate such systemwide efforts as program review and student articulation." (Brisch, 1990, #13).

#### Statement of the Problem

The aviation associate degree programs do not usually mesh with the baccalaureate degree programs to allow students to complete both the associate and baccalaureate degree requirements within a four-year period. There was no articulation policy for major requirements in the Oklahoma State Regents of Higher Education policy. The Regents' policy only provided for articulation of general education course requirements for Associate in Arts and Associate in Science degree graduates who were entering baccalaureate

(b)

degree programs. Neither the specialty courses nor the general education courses of Associate in Applied Science degree graduates were covered in the policies to smooth the way for transfer students.

A student who graduated from a two-year college and entered an Oklahoma four-year university was sometimes treated as an entering freshman for the first semester at the university. The two-year college graduate was not respected and awarded privileges of other juniors who had previously attended the university. These students were not only excluded from such things as purchasing preseason football tickets and applying for scholarships but also would not have the opportunity to enroll in the most desirable class times because previously enrolled university students would be allowed to enroll before transferring students. These culturally shocking changes could be alleviated through better articulation.

#### Purpose of the Study

The purpose of this study was to determine ways to improve the articulation and transfer for aviation students graduating from two-year colleges and continuing toward aviation baccalaureate degrees in Oklahoma universities. Currently, there is no written Oklahoma State Regents for Higher Education policy for articulation from Associate in Applied Science degree programs to baccalaureate programs.

Most of the two-year aviation programs led to Associate in Applied Science degrees.

Baccalaureate aviation programs had few professional courses at the freshman and sophomore levels. For example, the Oklahoma State University aviation program had only eight hours of aviation professional courses below the junior level. An Associate in Applied Science program was required to have a minimum of 29 aviation specialty hours, all at the freshman and sophomore levels. Another purpose of this study was to explore ways of connecting the two- and four-year programs to allow the aviation student to complete both associate and baccalaureate degrees in an economical four-year time period.

Course titles varied considerably among colleges. The University Aviation Association has published the College Aviation Accreditation Guidelines. (University Aviation Association, 1976). The guidelines recommended course titles and semester hours but did not recommend which courses should be upper-division level.

#### Limitations of the Study

This study was developed primarily from current data obtained from catalogs and schedules for the fall semester of 1990 from the 47 Oklahoma colleges and universities. Both private and public institutions of higher education were included in this study.

The study included only programs that were in effect at the end of the 1990 fall semester. Information from the catalogs and schedules was supplemented by interviews with aviation program heads or coordinators. The program head or coordinator was accepted as the final authority on program content and agreements.

### Assumptions

The following assumptions were made:

- (1) that the information published in the schedules for the 1990 fall semester was correct and complete.
- (2) that the information published in the catalogs that were current for the 1990 fall semester was correct and complete.
- (3) that interviewees were able to respond fully and accurately to questions asked.

### Definitions

The following definitions were used in the presentation of the study.

Articulation. The processes and relationships involved in the systematic transfer of students between institutions of higher education. This included the services that were provided to students who were transferring from two-year to four-year higher education institutions, those transferring from four-year to two-year institutions, and those



transferring laterally between higher education institutions.

FAA. Federal Aviation Administration. This organization is responsible for supervising, controlling, and regulating civil aviation.

Native student. A student who originally enrolled in an institution of higher education and has not subsequently enrolled in another.

Part 61. Federal Aviation Regulation Part 61, entitled Certification: Pilots and Flight Instructors, regulated training and issuance of pilot certificates. Pilot training was conducted under this regulation. See Current Federal Regulations in Chapter II for more detail.

Part 65. Federal Aviation Regulation Part 65, entitled Certification: Airmen Other Than Flight Crewmembers, regulated the issuance of aviation mechanic certificates. Mechanic training was conducted under this regulation. See Current Federal Regulations in Chapter II for more detail.

Part 141. Federal Aviation Regulation Part 141, entitled Pilot Schools, regulated FAA approved Pilot Schools. These schools operate under a more restrictive regulation than Part 61. See Current Federal Regulations in Chapter II for more detail.

Part 147. Federal Aviation Regulations Part 147, entitled Aviation Maintenance Technician Schools, regulated aviation mechanic schools. These schools operate under more

restrictive regulation than Part 65. See Current Federal Regulations in Chapter II for more detail.

Transfer. The exchange of course and credit equivalency.

Transfer student. A student who had transferred from another institution of higher education.

UAA. University Aviation Association. The professional organization of collegiate aviation education.

By the fall of 1990, aviation programs were offered by both two-year and four-year institutions in Oklahoma. The two-year and four-year programs usually did not fit together to allow a student to complete both within four years. Much research of articulation had been conducted in recent years. A review of literature will help put the articulation of aviation programs in Oklahoma in better perspective.

## CHAPTER II

### REVIEW OF THE LITERATURE

#### Introduction

Since the beginning of the junior college movement early in the twentieth century, the number of students transferring from two-year to four-year institutions of higher education have been significant. Most of these transfer arrangements have been informal. The literature concerning articulation and transfer became prominent in the 1960s as higher education expanded to meet the exploding demand. Transfer and articulation continued to appear in the literature frequently through the 1980s and into the last decade of the twentieth century. Collegiate aviation education is experiencing new support for articulation with transfer agreements emphasized by the FAA's Airway Science Program. As higher education continues to become more competitive, articulation will become vital to institutional survival in the 1990s and beyond.

The literature review is presented in a chronological order. First, some of the limited articulation and transfer literature published prior to 1960 is reviewed. Then, literature from the 1960s and 1970s is presented. The bulk

of the literature was published in the 1980s and is presented next. The review of some Airway Science literature is followed by current literature published in 1990 and 1991. Finally, Federal Aviation Regulations covering pilot and mechanic training and education are reviewed. A summary presents the literature review findings.

### Background Literature

In 1939, Congress established the Civil Pilot Training Program to train 10,000 pilots in 460 colleges in the United States. (Aviation Fundamentals, 1988, p. 10-50). Congress appropriated \$4,000,000 for this program. As a result, Piper built thousands of J-3 Cubs.

Brick quoted C. C. Colvert, president of the American Association of Junior Colleges, who addressed junior college educators at a meeting in 1941. Colvert admonished:

Had not we of the junior college been so busy trying to offer courses which would get our graduates into the senior colleges instead of working and offering appropriate and practical courses - terminal courses - for the vast majority of junior colleges students, we might have thought to ask for, and as a result of having asked, received the privilege of training these young people. (Cited in Brick, 1965, p. 121).

As early as 1950, J. P. Bogue, Executive Secretary of the American Association of Junior Colleges, thought that transfer policies should be liberalized. He wrote:

On the basis of this nationwide evidence, it would appear that many senior colleges and universities could safely and wisely broaden and liberalize their policies concerning provisional acceptance of graduates of junior-college terminal curricula. Such a policy would tend to facilitate satisfactory guidance procedures in the junior college and encourage enrollment of students in curricula apparently best suited to their special needs without making the decision regarding possible subsequent work in a higher educational institution the primary factor in the choice of such a curriculum. (Bogue, 1950, p. 75).

In The Junior College: Progress and Prospects (1960), Medsker reported the results of a study conducted of the 1952 entering class in 63 cooperating two-year colleges which enrolled 17,627 students in September, 1952. Medsker found that a median of 35% graduated, 33% transferred, and 56% of those who graduated, transferred. Medsker studied the performance and retention of the transfer student. In general, the transfer students did somewhat less well than the native students in the first term after transfer. By the end of the senior year, however, the transfer student grades closely approached the native student grades and tended to have not more than a 0.3 grade point differential. The retention rates for transfer students were markedly lower than for native students. The percentage of students receiving baccalaureate degrees at the end of the second year after transfer was much lower than for the native students. Only 40% of the transferring students received baccalaureate degrees by the end of four years after entering junior college. However, institutions reported a

greater number of transfer students who completed degrees later.

Clark discussed problems of handling students who wished to transfer but did not have the academic ability in The Open Door College: A Case Study. (1960). The open door policy was created by, ". . . the education code: 'The principal of any two-year junior college shall admit to the junior college any high school graduate and any other person over 18 years of age who in his judgment is capable of profiting from the instruction offered.'" (Clark, 1960, p. 44). San Jose Junior College was established as a technical or trade school primarily with terminal, two-year programs. Sixty percent of the students in the first semester were enrolled in transfer curricula. By the third year, 75% of students enrolled in transfer programs, but only about one-third would transfer. Clark identified the students who declared themselves to be transfer students but who did not have the academic ability to be transfer students as latent transfer students. The "cooling-out" function was developed to direct the latent terminal students into true terminal programs. This is an important function of the junior college.

Knoell and Medsker (1964) reported the results of their research of the performance of transfer students in 43 colleges and universities in Factors Affecting Performance of Transfer Students From Two- to Four-Year Colleges.

Located in ten states selected on the basis of geography and type of state-wide control, these colleges and universities were divided into five categories: major universities, teachers' colleges, other state colleges and universities, private colleges, and technical schools. Junior college students who transferred in 1960 were included in the study group as well as a sample of native students who graduated in 1962 which were used for comparison.

The authors found that 45% of the students who transferred after two years in junior colleges earned baccalaureate degrees about two years later. Another 31% were still enrolled at the end of two years and eligible to enroll in the next term. After transfer, the average grade-point drop was 0.3 in the first term. However, the averages for the transfer students increased each semester from 2.27 for the first semester to 2.68 for the fourth semester after transfer. The transfer students earned higher averages than the native students in lower division, but the native students earned higher averages in the upper division.

Nearly half of the students lost no credit in transferring from junior college. About 20% lost the equivalent of a three-hour course. Less than 10% lost substantial amounts of credit, such as a semester. The student's probability of graduating on time was significantly related to the choice of major and the choice of four-year college. Students majoring in teacher

education had a high incidence of graduating on time while those majoring in engineering had high attrition and a low probability of graduating in two years. Transferring students were just as efficient as native students in terms of the number of semesters attended and units earned toward the baccalaureate degree requirements. However, higher percentages of native students maintained continuous enrollment through graduation. (Knoell & Medsker, 1964).

They found that practices in awarding credit for junior college courses appeared to be fairly arbitrary and varied randomly among the colleges. In general, approximately one-half of the baccalaureate degree requirements as well as only the lower division courses would be considered for transfer credit. A better rationale was needed. There was gradual obliteration of the distinction between upper and lower division courses. Considerable amounts of advanced standing credit were awarded to entering freshmen. The findings implied that a rationale for awarding transfer credit should be based on the principle of what was in the best interest of the student, rather than an arbitrary division of responsibility between the two- and four-year institutions.

The Two-Year College: A Social Synthesis reported that, "The two-year college was receiving increasing recognition as the most significant development in American education in



the past half century." (Blocker, Plummer, & Richardson, 1965, p. 1). The authors said:

Junior college will be used to identify public or private two-year colleges whose primary emphasis is upon college-transfer courses and programs. Community college, as defined by the authors, is a comprehensive public two-year college which offers post-high school education programs to meet the needs of the community. (Blocker et al., p. 23).

The authors reported "The transfer function is the oldest and most revered of the educational services which the two-year colleges provide, and the latecomers - technical, vocational, and guidance programs - are still having to justify their value and continued existence in such colleges." (Blocker et al., p. 31). Transfer programs were quickly modified when four-year institutions made changes in entrance requirements. Wisconsin, Indiana, and Georgia have no provision for publicly supported community colleges independent of public four-year institutions. (Blocker et al., p. 64). The community college builds its curriculum in response to external influences. The two strongest external influences are university curriculum requirements and state legislation. (Blocker et al., p. 148). The two-year colleges have an opportunity to prepare technicians for the large demand. They defined a technician, ". . . as any person who assists with the applied aspects of a trade or profession." (Blocker et al., p. 215). They closed with, "In the final analysis, the

two-year college will not necessarily be judged by how many things it attempts but, rather, by how many things it successfully accomplishes." (Blocker et al., p. 289).

#### Literature in the 1970s

Landrith (1971) made a study of the number of students who graduated with an Associate in Arts degree and found that more than 50% of those who graduated from seven of the ten junior colleges studied entered four-year colleges and universities. The percentages ranged from 82% to 31%. (Landrith, p. 65). Koos found justification for the technical-occupational programs offered by the community colleges. He wrote, "A main line of justification for semiprofessional offerings in the community college is to be found in the attrition in its student body, since such a large proportion of this student body neither completes the two-year program nor transfers to the senior college." (Koos, 1970, p. 470).

Monroe (1972) in, Profile of the Community College, reported that the transfer program overshadowed all other community college programs before 1950. Before 1950, articulation between two-year and four-year colleges was a serious problem. Monroe wrote, "Before 1950, even up to 1960, community colleges, as a group, had such a poor image in higher education circles that most senior institutions tended to ignore them." (Monroe, p. 63). He observed,

"Before 1950, scarcely any formal arrangements existed for facilitating articulation between community colleges and the senior institutions. By 1960, articulation arrangements had been developed in California, Florida, and Illinois. By 1970, most states had instituted formal machinery for coordinating the work of several components of higher education." (Monroe, p. 64). The ratio of transfer to non-transfer students at the time Monroe wrote was three-to-one. He predicted, "By 1980 the nit-picking system of evaluating each student's transcript, course by course, will undoubtedly be replaced by a blanket transfer policy which will automatically admit all community-college graduates." (Monroe, p. 65). Articulation problems remained in transferring occupational, remedial, and general studies, but good students could bargain for acceptance of courses which had a high measure of technical content.

Zwerling's introduction to Second Best: The Crisis of the Community College (1976) included discouraging statistics about community colleges. He wrote that:

Up to 75 percent of students entering community colleges leave and never return. . . . Fewer than 25 percent of students in community colleges ever graduate. . . . Fewer than 12 percent of students in community colleges complete four years of higher education. . . . Fewer than 5 percent of community college students graduate from professional and graduate school. (Zwerling, pp. xiii-xiv).

Zwerling addressed the transfer trauma. Most four-year colleges accepted a transferring student's entire package of

credits if the student had earned an associate degree. There were problems if the student transferred prior to earning a degree or sought to transfer technical-vocational credits. (Zwerling, p. 233).

The Middle States Association of Colleges and Schools published A Guide to Postsecondary Articulation Programs in the Middle States. (Crawford, 1978). This was intended to serve as a guide to specific articulation practices of colleges and universities. This association included secondary schools and institutions of higher education in New York, New Jersey, Pennsylvania, Delaware, Maryland, the District of Columbia, Puerto Rico, the Virgin Islands, and the Canal Zone. Institutions of higher education were requested to develop brief descriptions of any formal articulation arrangements with schools, other colleges, or that were available to individual students. Still, the guide recommended that the college catalog or the Articulation Contact be consulted because space limitations in the guide precluded much detail.

Whitlock (1978) presented ways to allow students to complete baccalaureate degree requirements in shorter times than the traditional four-year period following completion of high school. Former president of Simon's Rock Early College, Whitlock emphasized the program that accepted students following the tenth, eleventh, or twelfth grades and provided them the opportunity to complete Bachelor of

Arts degrees four years later under the authority of the Commonwealth of Massachusetts. Admission was based on maturity and academic ability. A tenth grade student from a good high school who had an average of B to C grades might be successful. Whitlock pointed out other current methods for shortening the time to a baccalaureate degree including three-year degree programs, year round scheduling, and undergraduate-graduate shortened programs.

#### Literature of the 1980s

In 1982, Schukert edited the Collegiate Aviation Directory: A Guide to College-Level Aviation/Aerospace Study. Schukert reported 454 colleges and universities with aviation/aerospace programs. He listed 15 Oklahoma colleges and universities with aviation programs. In a telephone interview, Schukert reported that he had maintained and updated the data base. He reported a total of 375 baccalaureate aviation/aerospace programs and 376 associate aviation/aerospace programs as of May 1991. Included in these programs were aeronautics, astronautics, engineering and astrophysics.

The Policies of Senior Colleges and Universities Concerning Transfer Students from Two-Year Colleges in North Carolina (1983) presented the transfer policies of the 46 senior colleges and universities. Prepared under the aegis of the Joint Committee on College Transfer Students, the

report covered the admission of transfer students, and the granting of credit to transfer students. Sample transfer agreements were included.

Kintzer, in The Multidimensional Problem of Articulation and Transfer (1983), stressed that the transfer of students could no longer be considered only in the terms of linear progression from community colleges to four-year institutions. He defined transfer as the movement of students and their academic credits from one school to another. Kintzer then defined articulation as services for transfer students and identified six categories of transfer students: articulated vertical; reverse (from a four- to a two-year college); vocational; lateral; international (foreign); and nontraditional (stop outs, industry, government, and experimental learning). Kintzer suggested that further research was needed to develop uniform identification and counting systems.

In 1984, Adelman and Reuben reported on notable programs, practices, and goals in, Starting with Students: Promising Approaches in American Higher Education. Among the notable programs was an Aviation Administration program that led to the Bachelor of Professional Studies degree at the University College of Memphis State University. This program was designed for employees of the Federal Aviation Administration. The College University awarded the FAA

employee 34 credit hours for learning represented by the Journeyman's license.

Walton, in "Articulations Transfer Agreements, Minimum Grades Acceptable on Transfer Courses, and Transferability of Associate Degrees," published in the Community College Quarterly in 1984, surveyed 1,000 two- and four-year institutions to examine transfer agreements and transferability of associate degrees in 1982. An articulation agreement was defined as: "A specific written agreement between two institutions (frequently between a two-year institution and a four-year institution) whereby student transfer is facilitated (and often guaranteed). The agreement assures the transferability of credits taken at the first institution into a program or course of study at the receiving institution." (Walton, p. 171). The majority (57.7%) of all institutions had no written agreement about transfer. Only 20.7% of the responding four-year institutions had articulation agreements with two-year colleges, and 20.1% had course transfer lists. Walton found that institutions with higher percentages of transfer agreements were public rather than private colleges, two-year rather than four-year, large, and located in the West.

Walton (1984) also found that the majority (68.1%) of the four-year institutions did not accept the Associate of Arts and the Associate of Applied Science degrees without

evaluating courses individually. Of the four-year institutions that accepted associate degrees without evaluating courses individually, 16.5% accepted both the Associate of Arts and the Associate of Applied Science, 14.2% accepted the Associate of Arts only, and 1.1% accepted the Associate of Applied Science only.

Bridging the Gap: A Case Study of Cooperative Strategies to Improve the Transfer Experience (1985), reported on projects involving the City University of New York and the transfer of community college students. (Bowles, Murtha, Call, & Zadra, 1985). All of the students who transferred from Queensborough to City College in three semesters in 1983 and 1984 were studied. The study showed, "that 69% of the students who followed the Electrical Technology program at Queensborough did not pursue the Bachelor of Technology program at City College." (Bowles et al, p. 6). The study also found, ". . . 25% of the students with an AAS degree in Computer Technology chose to major in Engineering." (Bowles et al., p. 7). Prior to the study, the institutions were not aware of the movement of technology students into the Bachelor of Engineering program. Another trend discovered in the study was that community college Design Drafting students selected architecture as their major at the baccalaureate level. Eighty-two percent of the community college Design Drafting students wished to pursue majors in architecture. Students



did not plan far ahead with 73% reporting that the decision to transfer was made in their final semester at the community college. Thirty-six percent of the transfer students reported they had changed their career objective. Students cited the need for more counseling and individual attention from the faculty at the senior college. The students perceived that having ready and early access to articulation information had the greatest impact on the success of their transfer. More than 50% of the City College graduates started their post-secondary studies at another institution. (Bowles et al., pp. 8-11).

In 1985, Fairweather and Smith reported the progress of the State University College at Plattsburg (SUCP) to formalize its articulation agreements with all of the community colleges in New York State in Facilitating the Transfer Process: The Need for Better Articulation between Two and Four Year Colleges. There were 37 community colleges in the state. They wrote,

It is imperative, therefore, that the two-year colleges demonstrate clearly that the process of transferring to the four-year institution is relatively trouble free, while those "senior" colleges who develop a record of easy administrative transfer for the qualified student (not an academic open-door policy) will reap significant enrollment rewards. (Fairweather & Smith, p. 1).

The reason that there were so few institutions with formalized transfer articulation agreements is that these agreements require a considerable commitment of time and

effort between the participating institutions. Course by course evaluation is extremely time consuming, yet it is the foundation of the whole articulation process. Reviewing catalogs is not sufficient. Course outlines and course content must be reviewed. Personal contact is important, but it is time consuming and costly, which is probably why more institutions did not have formalized agreements. SUCP decided to formalize transfer articulation agreements in the mid-1970s. It was important to place the articulation agreements in an easily understood format. The SUCP requirements for each of the programs were listed in a column on the left side of the page while the particular community college program requirements were listed in a column on the right side of the page. At a glance, one could identify which courses met the SUCP program requirements. The transfer articulation system had been in operation for two years and required little work to maintain and update.

In the Articulation/Transfer Phenomenon: Patterns and Directions (1985), Kintzer and Wattenbarger defined articulation as ". . . the generic term referring to the entire range of processes and relationships involved in the systematic movement of students interinstitutionally and intersegmentally throughout postsecondary education." (Kintzer & Wattenbarger, p. iii). They defined, "Transfer - the mechanics of credit, course, and curriculum exchange -

is one of the processes." (Kintzer & Wattenbarger, p. iii). Transfers from community colleges to baccalaureate degree programs had been declining in the last decade. Reasons included deteriorating articulation services for transfers, competition for minorities, lack of uniformity of credit acceptance in multiversities, and shift from academic to occupation career interests. Transfer students will not regain a preeminent role until 2000. The proportion of transfer students had slipped from 66% to 43% by 1973. Of all credit students, 63% were in occupational programs.

The authors reported articulation trends across the nation. In Illinois, Associate in Arts and Associate in Science graduates performed better than native students in retention, baccalaureate degree completion, and grade point average. The Oklahoma State System Plan was discussed and reported to require 33 hours of general education. They wrote, "Although occupational education is not directly mentioned in the agreement, graduates of community college career programs are encouraged to include major courses to meet baccalaureate requirements." (Kintzer & Wattenbarger, p. 31). Courses classified as junior level yet open to sophomores in Oklahoma four-year institutions may be transferred from community colleges. The community colleges were a part of the university system in Kentucky and Nevada. Two-plus-two programs were used in Oregon and Texas. These programs offered the first two years at a two-year college

and the final two years at a four-year institution. In North Carolina, the Bachelor of Technology degree provided for exchanges between the two- and four-year schools. Upper-level universities were found in 11 states. There were a total of 25, and more than one-half were located in Texas. The number of states formulating articulation and/or transfer policies had not increased substantially in the last fifteen years. Some state legislatures required that transfer agreements be made. Credit based on experience may not transfer.

Romero directed the project titled, Improving the Articulation/Transfer Process between Two- and Four-Year Institutions (1985), a collaborative effort involving Arizona, California, Colorado, and New Mexico. This project resulted in a Handbook for Articulation Task Force, an Equivalency Guide for Arizona, and a Users Manual. Colorado gained a Guaranteed Student Transfer Program including a Contract for Admission to Colorado State University, and a Memorandum of Agreement. Computer software was developed to display course equivalencies and programs of study between Denver Community College campuses and Colorado State University.

Marczak (1985), in Factors Influencing Adoption of AAS Program Articulation Agreements Between Community Colleges and Eight Senior Colleges and Universities in Michigan, studied the development of articulation agreements for

Associate in Applied Science programs. The Associate of Arts degree graduate could transfer to a university or college in Michigan with full recognition of credits since the mid 1970s. After the State Board of Education became involved because of complaints from citizens, agreements of articulation for the Associate in Applied Science degree programs were worked out among community colleges and eight senior Michigan colleges. Marczak stated, "The view of the AAS degree that was developed by educators working together was that it presented a package of learning that could be built upon, but not in the traditional sense. The terms '2 + 2' or 'degree in reverse' are aptly applied to the results of the articulation agreements." (Marczak, p. 125.).

Kintzer evaluated statewide articulation and transfer agreements in 1985. He defined articulation as referring, "to services provided students transferring from high schools - to community colleges - to universities and the reverse, and laterally throughout higher education." (Kintzer, p. 1). He defined transfer as, "course and credit equivalency exchanges." (Kintzer, p. 1). His focus was on a taxonomy of types of agreements.

The original taxonomy of 1972 contained 22 states and this was expanded to 37 states in his taxonomy of 1976. Kintzer's study of 1985 targeted 21 states where statewide articulation and transfer had changed in character and where

multiple types had appeared in some cases. Each of the taxonomies was divided into four types of agreements.

The group of states with Formal and Legal-Based Guidelines and Policies traced their authority to the state constitution, legislature, education code, or master plan. The states in this group that were the focus of Kintzer's research in 1985 were Florida, Illinois, Massachusetts, Nevada, Rhode Island, South Carolina, and Washington. Associate degree completion was the basic qualification for transfer although credits for individual courses were usually accepted. Articulation services were included, and general education requirements were presented in detail.

In the second group, Kintzer (1985) included states that had State System Policies. The states in this group that were the focus of Kintzer's research in 1985 were Arizona, Hawaii, Maryland, New Jersey, New York, Oklahoma, Virginia, and Wyoming. The State System Policies emphasized credit transfer, showed less attention to articulation services, placed responsibility in a state official, often in the university system, and gave substantial power to the responsible agency. Kintzer included Oklahoma in the group of states with this type of agreement.

Kintzer's third group of states had Voluntary Agreements Between Institutions or Within States. Kintzer focused his 1985 research on California and Pennsylvania. In this group, decisions were reached as transfer cases

arose. The small number of transfer applicants in some states postponed the need for formalized agreements. About one-half of the 50 states were included in this group. The fourth group included States Specializing in Vocational-Technical Credit Transfer. Kintzer focused his research on Michigan, North Carolina, Ohio, and Oregon in this group. Included in the group were the long-standing technical institute/senior college-university baccalaureate packages. The newest were four-year programs that tie the final two Tech Prep years in high school with the associate degree years in two-year colleges. Many states had multiple types of statewide agreements and would be listed with more than one group.

Kintzer (1985) found that although interinstitutional credit transfer was in effect from the beginning of the junior college movement, these transfer arrangements remained informal and individualized for decades. Dating from the California Master Plan for Higher Education, 1960, state master plans lacked transfer policies on a statewide basis. More recent interest was shown in statewide transfer policy development. In 1965, the Florida State Board of Education approved an agreement which guaranteed transfer within the university system. Also in 1965, the Illinois General Assembly passed the Junior College Act which included articulation procedures. However, neither in Florida nor in Illinois were the articulation agreements

consistently used until 1971. State master plans recognized the value of a statewide policy on articulation and transfer in New Jersey (1970), New York (1972), Maryland (1973), Connecticut (1974), Kansas and Oklahoma (1975), and South Carolina (1979). As of 1985, about two-thirds of the 50 states had policy statements on articulation and transfer that encompassed major segments of higher education. There were only 10 states in which all of higher education was affected.

Kintzer (1985) summarized developments in the 21 states that he targeted. Noteworthy was the Articulation Council of California which had been in operation for more than 60 years. The Council was nongovernmental, voluntary, and self-regulating. Members were from higher education, public schools, and independent institutions. They met annually and were concerned with easing the flow of students.

The first statewide articulation agreement, the Florida Formal Agreement Plan, was approved in 1965 and reconfirmed in 1971. The original Florida plan was significantly changed in 1985 by adding the following: a statewide common course numbering system; a common calendar; College-level Academic Skills Test; and a common entry test.

The Oklahoma Plan became operational in 1977. A recent change was that senior institutions may require additional general education to graduate. However, this must be upper-division course work. Another provision of the



Oklahoma Plan provided that, ". . . courses classified as junior-level yet open to sophomores at senior institutions even though taught at a two-year college as sophomore-level courses, are transferrable as satisfying that part of the content area requirement." (Kintzer, 1985, p. 29). Kintzer indicated that this was a major breakthrough for community college education, and indicated that two-year college faculty have integrity in terms of degree application of courses, at least in Oklahoma.

Kintzer (1985) noted that there appeared to be renewed interest in transfer education, especially by state governments. A strident note to the national situation was that the Florida legislature had mandated a qualifying examination for higher education admission.

Palmer, in Bolstering the Community College Transfer Function (1986), viewed transfer as a multidimensional problem of student flow from high school through the baccalaureate level, not simply a matter of credit articulation. He would focus on the transferability of competencies as well as credits. This could be accomplished by the proper academic rigor and expected competencies of students; temporary appointment of community college faculty as visiting instructors at four-year institutions to reacquaint them with university students and the rigor at the upper division level; or by exit tests for transfer students. Problem areas that remained included identifying

potential transfer students, tracking them, and providing information for students.

Bender, a consultant from Florida State University, wrote that less than 50% of county community college graduates who transferred to the New Jersey state colleges had all credits accepted in, Transfer and Articulation Among the Public Institutions of Higher Education in New Jersey (1987). He found that only 25% of all undergraduates transferred at state colleges were at the junior or higher class level. He concluded that the Full-Faith-and-Credit Policy, upon which the study focused, "is more myth than reality." (Bender, p. iii).

Bender found a noteworthy exception in the New Jersey Institute of Technology (NJIT) which recognized associate degree graduates as juniors, and had a program to orient transfers. NJIT faculty taught transition courses on county college campuses as a part of the last year of the associate degree programs.

Bender made several recommendations in his report to the New Jersey Chancellor of Higher Education. He recommended a 2 + 2 program, and services comparable to lower division entry including recruitment, admissions, orientation, scholarship incentives, and advisement. He also recommended a computerized data bank, and an official articulation/transfer office at each college. Bender stated that, "The community colleges should strengthen their

capability to provide students with accurate information on transferability of all of their degree programs, including clarification of the AAS as an applied/practical education program that only should interface with baccalaureate level applied/practical programs." (Bender, p. ix).

In 1988, the Florida State Board of Community Colleges' Task Force on Articulation completed a study entitled, The Role of the Florida Community Colleges in Articulation. The study concluded that Florida's articulation system is unique. As a result of the national survey during the study, the task force found that other states have some of the provisions, but no other state has all of the parts contained in the Florida system. The community colleges were the primary provider of freshman/sophomore education. The Associate in Arts degree was the guaranteed transfer degree. The task force recommended that the State Board continue to evaluate the transferability of the Associate in Science degree. An articulation officer is required at each community college. The glaring weakness was the lack of a statewide approach to informing the public of the articulation system including its guarantees and benefits.

Bowles found discrepancies in articulation policies and practices in, "Transferability in the Liberal Arts and Sciences" (1988). The problems included senior college evaluations of community college courses, career-oriented courses, as well as 35% of liberal arts and science courses.

Articulation task forces composed of faculty members from each of the seventeen colleges of City University of the New York system. Each task force was co-chaired by a faculty member from a senior college and one from a community college. Five task forces were formed to identify problems and make recommendations in biology, chemistry, English, mathematics, and psychology. Bowles concluded:

Faculty-based articulation task forces are important vehicles for the identification and resolution of curricular issues in the transferability of liberal arts and science courses in multicampus systems. CUNY's five task forces enabled it to move beyond a unilateral process of course evaluation controlled by the senior colleges to a collaborative process based on mutual respect and cooperation among the colleges. (Bowles, p. 37).

Prager, editor of "Enhancing Articulation and Transfer" (1988), found that transfer education needed to go beyond academic parallelism. She wrote that, "Transfer education needs to be refocused to include education for all those who seek to transfer, regardless of academic track." (Prager, p. 2). Authors of reports and studies from foundation-funded projects frequently have concluded, ". . . that the single most promising strategy for reducing transfer barriers is intermural faculty exchange and communication." (Prager, p. 3). The community colleges should accept responsibility for the quality of student preparation for transfer.

Prager (1988) observed in, "The Other Transfer Degree," that as high as 50% or more of all community transferees

since 1970 have come from occupational-technical programs. Only three disciplinary areas have dealt with program design on a broad scale for occupational-technical transfer students. First, the governing authority for certain fields of allied health has promoted systemwide articulation, for example in Kentucky and North Carolina. Secondly, the Accreditation Board for Engineering and Technology has guided articulation for engineering technology programs. Thirdly, many community college business program practitioners feel that the American Assembly of Collegiate Schools of Business has discouraged transfer of the A.A.S. or related degree. The transfer rates for occupational-technical students and liberal arts and science students in community colleges were approximately equal. At least half of the two-year college graduates who transferred got baccalaureate degrees in the long term. The term "terminal" used to describe vocational programs is obsolete. Little has been written about articulation for occupational-technical students. Few education options are available to the vocational-technical graduates except in occupational education or in technology. Structured transfer designs help to depoliticize articulation for students, faculty, and institutions. The contract major approach, used at Southern Illinois University-Carbondale, transferred the associate degree in full as the major. This reversed the sequence of the traditional baccalaureate

program. The capstone program, used at Wayne State University, transferred the full technical degree and led to a Bachelor of General Studies degree. In the 2+2 program, students transferred from a two-year to a four-year degree in a specialized field. Prager recommended that the data base concerning occupational-technical transfers be improved, that general education be improved, and that transfer opportunities for career students be improved. Community colleges should provide more transfer services for graduates.

Riegle (1988) identified specific categories of information needed by staffs and students of Alabama two-year colleges from four-year colleges for an effective articulation and transfer feedback system. This system would supply information about mechanics of transfer, particular colleges and curricula for best opportunity for success in earning a baccalaureate degree, and evaluation of the transfer program.

Most of the problems of articulation have centered on three questions, according to Cohen and Brawer in, The American Community College (1989). They identified the questions as, "'Who decides?' 'What shall be the criteria?' and 'Who shall have ultimate authority?'" (Cohen & Brawer, p. 191). The problems became more complex as community colleges enrolled increasing proportions of entering freshmen. Typically universities decided who would be

admitted. Despite many efforts to involve faculty in articulation agreements, most of the work had been done by counselors, admissions and records officers, transcript analysts, and articulation officers. Reverse transfer was an important consideration because 25% of students in community colleges had attended a four-year institution, and 10% had at least a baccalaureate degree.

As occupational groups strived for professional status, professional training moved into universities early in the twentieth century. Community colleges recognized the need for semiprofessionals and technicians and responded with occupational curricula. To describe these, words such as, "terminal, vocational, technical, semiprofessional, occupational, and career have all been used interchangeably or in combination, as in vocational-technical." (Cohen & Brawer, 1989, p. 200). Occupational seemed to apply to the greatest number of community college programs. Usually, the term, "vocational," connoted less-than college-level work, "technical" implied preparation for scientific and industrial work, while "career education" addressed lower-school orientation toward the work-place. In 1973, only 25% of community college full-time students were reported to be enrolled in career programs. In 1985, 72% of community college graduates were enrolled in occupational curricula. A major change was that career programs in community colleges had become feeders to four-year

institutions. Students found that many credits of the occupational programs would transfer. The authors wrote:

The categories "occupational" and "transfer" became inadequate to describe the realities of the community colleges, and "terminal" certainly became obsolete. Sizable percentages of the transfer students sought leisure-time pursuits; sizable percentages of the occupational students desired certification for transfer. A view of the community colleges as terminal institutions and of the universities as institutions for students interested in the liberal arts is woefully inaccurate. (Cohen & Brawer, 1989, pp. 225-226).

Many community college career programs were serving as the first two years of baccalaureate programs and needed to be articulated. Community college representatives usually encouraged senior institutions to accept special interest and interdisciplinary courses. Articulation agreements often specified courses that two-year colleges could not offer including junior- and senior-level courses offered by the universities. The transfer function has changed, "Since the mid-1970s more students appear to have transferred to universities from career education programs than from college-parallel programs." (Cohen & Brawer, p. 304), "The community colleges may be better able than the senior institutions to offer the best form of lower-division studies." (Cohen & Brawer, p. 310).

The Collegiate Aviation Directory (1989) listed more than 370 institutions that offered aviation programs. Fourteen programs were listed as located in the state of



Oklahoma. Only eight of the Oklahoma colleges and universities were listed as offering degrees in aviation.

Vaala found that the majority of students who had transferred preferred the transfer program in, "Preference of Transfer Students for a Transfer Program" (1989). The study was conducted of transfer students attending a large university in western Canada during 1987-1988. Of 1,081 transfer students, 400 students received questionnaires and 100 students were invited to be interviewed. The majority (74%) of respondents preferred not to take all courses at the university. Many of the students were aware of formal guidelines which detailed articulation agreements between colleges and universities, but they had diverse interpretations. For example, some students generalized from the acceptance of a specific course for a specific program, to a conclusion that the course was acceptable for other programs. Students attributed problems in transfer to inadequate information and advice. Vaala concluded, "The substantial positive influence of college faculty on transfer students is a reflection of the support and encouragement available to students within the college system." (Vaala, 1989, p. 36).

The National Academic Achievement and Transfer Project aimed to strengthen relations between two-year and four-year colleges and improve transfer rates of minority students. (Leatherman, 1989, pp. A19, A20). The Ford Foundation

provided \$2.1-million for this 18-month project to be operated by the American Council on Education. Twenty-five four-year colleges were paired with 25 two-year colleges for \$25,000 grants. The emphasis was on institutions serving urban areas. Judith Eaton headed the new Center for Academic Achievement and Transfer which served as a clearing house for information on transfer rates and provided a focus for national attention on the issue of articulation. Spokesman for the American Association of Community and Junior Colleges, Palmer said, "We feel this is an improvement. By involving A.C.E., the umbrella group for higher education, you are involving higher education in a comprehensive way that hasn't been attempted before. . . . Transfer and articulation can't be achieved without cooperation from both four- and two-year colleges." (Leatherman, 1989, p. A20).

Brint and Karabel reported that the legitimacy of community colleges as higher education institutions was threatened by their emphasis on vocational training rather than traditional liberal-arts programs. (Brint & Karabel, 1989, pp. 135-137). They identified the decline in transfers during the last two decades to the point that less than 20% of the community college students transferred to four-year institutions. Their book, the Diverted Dream: Community Colleges and the Promise of Educational Opportunity in America, 1900-1985, reported that the

two-year college was now the principal gateway to higher education with almost 54% of the first-time freshman enrolled in two-year colleges. Attending a two-year college may reduce the prospects of educational and social mobility for the disadvantaged. Brint and Karabel wrote, "With minority students overrepresented not only in community colleges, but also in the vocational tracks within them, the issue of low transfer rates, particularly among black and Hispanic students, has taken on special political salience." (Brint & Karabel, p. 137). By 1980, the proportion of students in programs that prepared for occupations was 70%. They reported, "Existing data suggest that the alumni of vocational programs frequently are unable to find work in the occupations for which they were trained." (Brint & Karabel, p. 124).

Watkins (1989, November 1) announced the release of a report, *Bridges to Opportunity: Are Community Colleges Meeting the Transfer Needs of Minority Students?* The report recommended that community colleges make liberal arts programs their top priority if they are to help black and Hispanic students to transfer to four-year institutions. The report is based on a two-year study by Fred L. Pincus and Elayne Archer for the Academy for Educational Development. Pincus stated, "Students' interest in transferring has declined in part because the community colleges themselves are less concerned with it." (Watkins,

p. A35). The report found that between 15% and 25% of community college students transfer but only 10% to 15% earned a bachelor's degree. Minority students were less likely to transfer to four-year institutions. The report encouraged two- and four-year institutions to develop dual admission arrangements so that graduates of approved associate degree programs would be guaranteed admission as juniors to the four-year institution.

In 1989, De Los Santos and Wright addressed transfer patterns in Community college and University Student Transfers. They found that 44% of Arizona State University students enrolled in the fall of 1988 had attended a Maricopa County Community College. By contrast, 45.5% of the Maricopa County Community College District students who were enrolled in the fall of 1988 had attended other postsecondary institutions. They used the term "swirling" to describe students moving among the Arizona colleges and universities. More than 15% of the Maricopa County Community College District students had previously attended another college within the district.

The Model Articulation Project (2+2+2) (1989) included four unified school districts and the California State University at Los Angeles. Led by project director Keith K. Adams, this Articulation Consortium included 11 high schools, four continuation high schools, four adult schools, two regional occupational programs, Cerritos College, and

California State University at Los Angeles. The program provided for two years of high school study, two years of community college study, and the last two years of study at the university level. A student who came to Cerritos College from an articulated program at the secondary level could chose advanced placement only, advanced placement and credit by examination, or credit by examination. Under this project, a Cerritos College associate degree graduate met all of the lower division general education requirements of the California State University system.

#### Airway Science Program

Bowen, in The Federal Aviation Administration's Airway; Science Program as Perceived By Program Coordinators in Participating Colleges and Universities (1989), reviewed the literature related to the Airway Science Program. This program was developed soon after 12,000 striking controllers were fired by President Ronald Reagan in 1981. The FAA's purpose for this program was to broaden the knowledge base of its supervisory and managerial work force. Among the objectives of this five-year demonstration project were the recruiting and hiring of graduates of a model college-level curriculum consisting of general studies, mathematics, science and technology, management, and aviation courses; evaluation of the concept that these graduates were better able to perform the job functions than those hired based on

general and specialized experience; and the assessment of the performance, job attitudes, and potential of the airway science graduates versus those employed by the current procedures. The FAA contracted with the University Aviation Association (UAA) to implement the Airway Science Program. Bowen's research was based on U.S. Government documents and University Aviation Association reports and documents.

Bowen also reviewed the literature relating to the Airway Science Program in the 1980s. The UAA Airway Science Curriculum Committee was formed from 15 representatives elected from the airway science institutions of which there were 32 in 1989. Journals, especially Aviation Week & Space Technology, as well as official government and UAA documents pointed out concerns during the project, such as FAA hiring practices and look-a-like graduates. No summary information about the effectiveness of the Airway Science Program was found in searches through the literature of all popular sources. Bowen found that, "The most commonly recurring criticism of the Airway Science Program was the negligible hiring of Airway Science Program graduates by the Federal Aviation Administration." (Bowen, 1989, p. 55).

The Airway Science Curriculum was designed as a four year baccalaureate program. The Airway Science Curriculum Committee encouraged community colleges to offer courses within the airway science curriculum that are considered lower division courses. Community colleges were encouraged

to make articulation agreements with four-year institutions taking Airway Science Curricula. Community college students should be advised to take only courses considered to be lower division by the four-year institution. These students should then be encouraged to complete an associate degree although this would usually not be in aviation but rather an Associate in Arts, Associate in Science, or general studies. The community college student should be advised to make certain that he/she would be able to meet the four-year institution's residency requirement, which may be approximately one-half of the degree requirements. (Airway Science Curriculum Committee, No Date).

The Airway Science Curriculum Guidelines For Community Colleges listed 70 semester hours of lower division core courses. Among these courses were Introduction to Aeronautics (may be Private Pilot Ground School), Air Traffic Control, and the National Airspace System. Among the lower division courses from the area of concentration in Aircraft Systems Management were Private Pilot Certification (Ground & Flight), Commercial Pilot Certification (Ground & Flight), Instrument Rating (Ground & Flight), Meteorology, Air Transportation, and one elective for a total of 24 hours in this area of concentration. Air Transportation was also included among the lower division courses in the Airway Science Management concentration.

## Current Literature on Articulation

### 1990s


University of Michigan researchers Lee and Frank found that few community college students from poor academic and economic backgrounds transferred to four-year institutions and completed baccalaureate degrees. They concluded, "It is social disadvantage which impedes community-college students from transferring, through the effect of social class on virtually all the academic behaviors associated with transferring." (Watkins, January 17, 1990, p. A35). The researchers reported that about a quarter of the students who went to community colleges directly after high school transferred to four-year institutions within four years. They used data from High School and Beyond, a national study of high-school students who were seniors in 1980. President of the American Association of Community and Junior Colleges Dale Parnell commented, "I get a little tired of university professors always trying to measure us against their arbitrary standards. The average age of our students is 29. They're working people, and two-thirds of them are only part-time students." (Watkins, p. A35)

The Oklahoma State Regents for Higher Education, and the governing boards of the colleges and universities spent much time and effort in strategic planning preparation and meetings to develop the Program for Academic Excellence and



Efficiency. Oklahoma State Regents for Higher Education Chairman James E. Barnes wrote to the governing boards, "This first round of such meetings has been most beneficial in taking stock of where we are and where higher education needs to go in meeting the demands of the 21st Century. . . . A number of issues were raised. . . . We have taken those concerns and what appear to be common goals and formulated the enclosed 18-point 'Program for Academic Excellence and Efficiency.'" (Barnes, 1990, p. 1). The tenth point addressed articulation and included, "Given the increased student mobility and enhanced opportunity for success, additional steps should be taken to remove potential penalties, enhance transfer, and better assure uninterrupted student success." (Brisch, 1990, # 10).

In "2-Year Institutions Under Pressure to Ease Transfers," published in the Chronicle of Higher Education on February 7, 1990, Beverly T. Watkins stated that streamlining the transfer process was critical to increase the achievement of minority students. One-third of the students enrolled in two-year colleges plan to continue but no more than one-quarter transfer. Transferring was a tough bureaucratic task for students. (Watkins, 1990, p. A37).



Watkins (1990, February 7) reported that the National Academic Achievement and Transfer Project at the American Council on Education was striving to improve articulation. The project attempted to make lower division offerings

compatible at twenty-four pairs of two-year and four-year colleges so that community college students could transfer to baccalaureate institutions without having to repeat courses. This was a \$1.2 million project with support from the Ford Foundation.

Watkins (1990, February 7) reported other efforts to improve transfers. The United Negro College Fund had just completed a pilot project with 16 universities and 10 community colleges in the South to increase the number of black students who complete baccalaureate degrees. A second project was underway with five universities and seven community colleges. Elsewhere, the National Effective Transfer Consortium of 28 community colleges was conducting research on transfer practices. Another project designed to show that disadvantaged students could get a liberal-arts education and a baccalaureate degree, Exploring Transfer took about 50 black and Hispanic students from the City University of New York's Fiorello H. La Guardia Community College to participate in a summer program at Vassar College.

Killackey (1990) reported that the University of Oklahoma and Oklahoma City Community College had reached an agreement which allows the University of Oklahoma to teach select freshman, sophomore, and junior level courses on the Community College campus. In return, Oklahoma City Community College instructors would teach remedial classes

in history and science to University of Oklahoma students on the University campus as well as on the Community College campus. The two institutions are attempting to assure that courses taken at Oklahoma City Community college can transfer to the University of Oklahoma. About 40% of the University of Oklahoma students started as freshmen elsewhere. The agreement still required the approval of the Oklahoma Higher Education Regents.

Bowen, in Measurement of Participation Levels of Women and Minorities as Collegiate Aviation Educators (1990), found that there were 481 full-time faculty in baccalaureate-level aviation education programs as compared to the 464,072 total faculty in higher education. Only 5.2% of the aviation faculty were female but only 6.09 percent of FAA certificated pilots were women.

More than twenty years ago, the University Aviation Association (UAA) authorized the Accreditation Subcommittee to conduct a survey that led to a Task Force which developed the College Aviation Accreditation Guidelines in 1976. (Council on Aviation Accreditation, 1990). After much experience in review of curricula and inspection of nearly 30 aviation programs, the UAA established the Council of Aviation Accreditation (CAA) on October 18, 1988. Although it functioned as a subsidiary of UAA, CAA became operationally an autonomous, legally chartered entity with its own directors and officers elected from within the

organization. CAA operated within the concepts and principles of the Council on Postsecondary Accreditation (COPA) standards.

The CAA Accreditation Standards Manual (1990) contained the policies, method of evaluation, and criteria. The goals for accreditation included stimulating aviation program excellence and increasing, "The credibility, integrity, and acceptance of collegiate aviation programs within institutions, higher education, and aviation communities." (Council on Aviation Accreditation, p. 3). CAA limited programs which were eligible for accreditation to four-year institutions which had regional or equivalent national accreditation recognized by COPA (Council on Aviation Accreditation, p. 3). CAA listed faculty qualifications as,

Regular faculty directly involved in an aviation program must meet at least the minimum standards for academic credentials as these are specified by the institution and endorsed by the regional accrediting agency. 'Regular faculty' are persons with the titles of professor, associate professor, assistant professor, instructor, or other defined teaching personnel, who serve on appointments totaling fifty percent or more service to the university. (Council on Aviation Accreditation, p. 15).

At a later date, CAA will consider associate programs and graduate programs. The core curriculum should include communication, social science, humanities, mathematics, basic science, computer science, and other college requirements. Options of specialization for a baccalaureate education included Aviation Management, Aviation

Maintenance, Aviation Electronics, Aviation Studies, and Flight Education. Each option must contain at least 36 semester hours in addition to 12 semester hours of core aviation courses.

Six colleges and universities in Tulsa planned to pool their resources to improve student services and education. ("6 Colleges Pool," 1991). The six institutions were the University of Tulsa, Oral Roberts, University Center at Tulsa, Tulsa Junior College, the University of Oklahoma College of Medicine in Tulsa, and the College of Osteopathic Medicine - Oklahoma State University. The plan was designed to smooth transfer by letting students know which courses would transfer.

The Oklahoma State Regents for Higher Education approved the Program for Academic Excellence and Efficiency. ("Program for Academic Excellence," 1991). The program contained 18 recommendations some of which could be implemented immediately. Other recommendations will become long range goals. Each of the 18 recommendations was not identified in the article. This program was the result of the State Regents' and state colleges governing boards' strategic planning sessions held early in 1990. Later, public hearings sought student, faculty, and public input. State Regents Chairman George B. Kaiser said, "We are striving to enhance student success in the classroom and beyond. This ambitious but achievable plan focuses on

bolstering academic programs as well as student support services." ("Program for Academic Excellence," p. 1). Student success would indicate that articulation and transfer were included in the 18 recommendations. Kaiser stated that priority projects would be selected for implementation during the next year.

Grubb found that almost every component of transfer decreased between 1972 and 1980 in "The Decline of Community College Transfer Rates" (1991). Grubb based his calculations on the National Longitudinal Study of the Class of 1972, and the comparable High School and Beyond Study of the high school Class of 1980. The studies followed these high-school classes and were based on postsecondary transcripts. He calculated the probability for transferring to baccalaureate institutions for students who entered community colleges from the Class of 1972 as 28.7% versus 20.2% for the Class of 1980. Grubb concluded, "that declining transfer rates are due to many small influences, among them the changing demographic backgrounds of students, declining achievement during high school, a collapse of career counseling in high school and an increase in the numbers of 'experimenters' in community colleges, the shift from academic to vocational programs within community colleges, the apparent weakening of academic Associate degree programs as routes to transfer, an increase in

'milling around' in all postsecondary education, and declining federal aid." (Grubb, p. 215).

### Current Federal Regulations

Federal Aviation Regulation (FAR) Part 61, entitled Certification: Pilots and Flight Instructors, governed pilot and flight instructor initial and recurrent training, and issuance of certificates and ratings. Subpart D of Part 61 described the requirements for Private Pilot which included at least 40 hours which consisted of a minimum of 20 hours of flight instruction and 20 hours of solo flight time. Subpart D covered the Commercial Pilot which required at least 250 hours of flight time including at least 50 hours of flight instruction and 100 hours of pilot in command time. Subpart F regulated Airline Transport Pilots who were required to have at least 1,500 hours of flight time as pilot. Subpart G regulated Flight Instructors who were required to be commercial pilots or airline transport pilots. Flight Instructors were authorized to give ground and flight instruction. Part 61 listed eligibility requirements for each of the certificates and ratings, as well as required aeronautical knowledge. Written and practical tests were required for each pilot certificate.

Federal Aviation Regulation (FAR) Part 65, entitled Certification: Airmen Other Than Flight Crewmembers, prescribed the requirements for issuance of mechanic

certificates and ratings in Subpart D. Graduation from a certificated aviation maintenance technician school provided an avenue to become an aviation mechanic. Another option was to complete at least 18 months of practical experience repairing airframes or powerplants, or 30 months of practical experience repairing both to qualify for both ratings. This experience could be gained under the supervision of a certificated aviation mechanic. Experience gained working in certain military specialty codes could also be approved. In addition to the graduation from an approved school or practical experience, aviation mechanics were required to pass written and practical tests.

Federal Aviation Regulation (FAR) Part 141 prescribed the requirements for Pilot Schools. Pilot Schools had specific requirements for personnel, aircraft, and facilities. A chief flight instructor of a private pilot course had to have at least a commercial pilot certificate and a flight instructor certificate as well as 1,000 hours as pilot in command, and flight instruction experience of two years and 500 flight hours or 1,000 hours of flight instruction. The chief flight instructor for a commercial pilot course was required to have at least 2,000 hours as pilot in command. A detailed training course outline including a training syllabus was required for each course. Operating rules required that, among other things, "The chief instructor or designated assistant chief instructor



shall be available at the pilot school, or if away from the premises, by telephone, radio, or other electronic means during the time that instruction is given for an approved course of training." ("Pilot, Flight," 1991, par. 141.85). The operating rules also provide for transfer, "A student may be credited, but not for more than one-half of the curriculum requirements, with previous pilot experience and knowledge, based upon an appropriate flight check or test by the school. Course credits may be transferred from one certificated school to another. The receiving school shall determine the amount to be transferred, based on a flight check or written test, or both." (FAA, 1974, par. 141.77). Appendix A of Part 141 described the minimum curriculum for a private pilot course which included at least 35 hours of ground training, 20 hours of flight instruction, and 15 hours of solo flight. Appendix D prescribed the minimum curriculum for a commercial pilot course which included at least 100 hours of ground training, and at least 190 hours of flight training and instruction.

Federal Aviation Regulation (FAR) Part 147, entitled Aviation Maintenance Technician Schools, prescribed the requirements for approved schools. Requirements for facilities, equipment, instructors and curriculum were covered in detail. The curriculum for Airframe required at least 1,150 hours of instruction including 750 hours of airframe instruction and 400 hours of general. The

Powerplant curriculum required 1,150 hours of which 750 hours covered powerplants and 400 hours was general. The curriculum combining airframe and powerplant instruction required 1,900 hours. Graduates were required to take written and practical tests to qualify for aviation mechanic certificates. FAA Part 147 provided for transfer credit. A school may grant credit for instruction completed at a university; a college; a junior college; a vocational, technical, trade or high school; a military school; or another aviation maintenance technician school. (Aviation Maintenance Technician Schools, 1990, par. 147.31).

#### Predictions of the Future

In 1988 Dale Parnell stated, "The Core Curriculum will be as valid for technical education students as it is for the liberal arts students," in The Future of the Community College (Parnell, 1988, p. 7). He also warned that university professors must accept the advantages of allowing specialized training to be conducted along with the lower division core curriculum rather than after the lower division experience. Parnell predicted that, "By 2010 every state will have developed coherent collegiate student transfer agreements, coordinated academic calendars, common course numbering, and sequential curriculum planning. The fabric of schools, community colleges, and universities will

look much more like a seamless garment than it does today." (Parnell, 1988, p. 11).

### Literature Summary and Findings

The transfer of students from two-year to four-year institutions of higher education was the most significant purpose of two-year colleges in the first half of the twentieth century. Yet there was little literature that addressed transfer and articulation until the last half of the century. As a result of a study during the 1950s, Medsker (1960) discovered that only 33% of two-year college students transferred to four-year institutions. But that may have been the high point.

#### Transfer Decreased

The transfer of students from two-year to four-year institutions of higher education has decreased significantly during the last half of the twentieth century. Clark (1960) found that 75% of the students enrolled in transfer programs but only about one-third would transfer. Zwerling (1976) wrote that 75% of students entering community colleges leave and never return. Brint and Karabel (1989) found that transfers had declined during the last two decades to the point that less than 20% of community college students transferred to four-year institutions. Grubb (1991) calculated the probability for transferring to baccalaureate

institutions for students who entered community colleges from the high school class of 1972 as 28.7% versus 20.2% for the high school class of 1980. Kintzer and Wattenbarger (1985) reported that the proportion of transfer students had slipped from 66% to 43% by 1973, and that 63% of all credit students were in occupational programs. Reported by Watkins (1989), Pincus and Archer found that between 15% and 25% of community college students transferred, but only 10% to 15% earned a bachelor's degree. Koos (1970) found that a main line of justification for semiprofessional offerings in the community college was that such a large proportion of this student body neither completed the two-year program nor transferred to the senior college. Pincus stated that the student's interest in transferring declined because the community colleges were less concerned with transfer. Kintzer and Wattenbarger (1985) identified the reasons for the decline in transfers as follows: deteriorating articulation services for transfers, competition for minorities, lack of uniformity of credit acceptance in multiversities, and the shift from academic to occupation career interests. Watkins (1990, February 7) observed that transferring was a tough bureaucratic task for students.

### Transfer Easier

Transfer has become easier in some cases. Articulation agreements have usually been established by states among

public colleges and universities. A two-year college student who completed an Associate in Arts or an Associate in Science degree was more likely to transfer. Landrith (1971) found that more than 50% of those who graduated with an Associate in Arts degree from junior colleges that he studied entered four-year colleges and universities with the percentages ranging from 31% to 82%. Knoell and Medsker (1964) found that the student's probability of graduating on time was significantly related to the choice of major and the choice of four-year college. Vaala (1989) found that the majority of students who had transferred preferred the transfer program.

Articulation agreements have usually been established by states among public colleges and universities. Articulation arrangements were established in California, Florida, and Illinois. Florida developed a formal agreement plan while common agreements were made in New York. The California Articulation Council has been in existence for more than 60 years. In 1989, an articulation consortium linked high schools, Cerritos College, and California State University at Los Angeles. A collaborative effort resulted in documents to improve articulation in Arizona, California, Colorado, and New Mexico (Romero, 1985). Marczak (1985) found that the involvement of the State Board of Education was a factor influencing the adoption of Associate in Applied Science degree articulation agreements between

community colleges and eight senior colleges and universities in Michigan. Although the Florida articulation system was one of the most comprehensive, it did not provide for articulation of the Associate in Applied Science degree programs.

More articulation information is available. According to Bowles, Murtha, Call, and Zadra (1985), students perceived that having ready and early access to articulation information had the greatest impact on the success of their transfer. The Middle States Association of Colleges and Schools published a guide for articulation programs in 1978 for New York, New Jersey, Pennsylvania, Delaware, Maryland, and the District of Columbia. North Carolina (1983) presented the transfer policies of senior colleges and universities. Foundations have supported projects to improve articulation and transfer, especially for minorities. The United Negro College Fund undertook projects to increase the number of black students who complete baccalaureate degrees. (Watkins, 1989). The National Academic Achievement and Transfer Project attempted to improve articulation and transfer by pairing two-year and four-year colleges. (Leatherman, 1989). The National Effective Transfer Consortium of 28 community colleges conducted research on transfer practices according to Watkins (1990, February 7). Riegle (1988) identified categories of information needed for an effective

articulation and transfer feedback system. Whitlock (1978) identified ways to allow students to complete baccalaureate degrees in shorter periods of time.

Articulation and transfer has improved in Oklahoma. In 1977, the Oklahoma articulation plan became operational and addressed articulation of general education (Kintzer, 1985). In the 1990s, new cooperation was reported among colleges and universities in the Tulsa area, and in the Oklahoma City area (Killackey, 1990). In 1991, the Oklahoma State Regents for Higher Education approved the Program for Academic Excellence which addressed student success through articulation and transfer.

### Problem areas

Major problems with articulation and transfer remained. Few private colleges and universities were mentioned in review of articulation literature. In the New Jersey system, only 25% of the transfer students were at the junior or higher level (Bender, 1987). Walton (1984) found that the majority of all institutions had no written agreement about transfer. Kintzer (1985) found that about two-thirds of the 50 states had policy statements on articulation and transfer, but in only ten states was all of higher education affected.

Fairweather and Smith (1985) concluded that the reason that there were not more written agreements about transfer

was that transfer and articulation agreements required a considerable commitment of time and effort. They wrote that course-by-course evaluation was extremely time consuming, but it was the foundation of the whole articulation process. Many courses did not transfer. Bowles (1988) found that not only did the occupational courses not transfer, but also 35% of the liberal arts courses did not transfer. Knoell and Medsker (1964) found that practices of awarding credit for junior college courses appeared to be arbitrary. Yet, two-year colleges quickly modified transfer programs when four-year institutions changed entrance requirements. (Blocker, Plummer, & Richardson, 1965).

As early as 1950, Bogue suggested that senior colleges could wisely liberalize policies to accept graduates of junior-college terminal curricula. Colvert stated that junior colleges were busy trying to get graduates into senior colleges instead of offering practical courses for the majority of students. (Brick, 1965). Koos (1970) concluded that the semiprofessional offerings were justified since a large proportion of the two-year student body did not transfer. But Brint and Karabel (1989) found that alumni of vocational programs frequently were unable to find work for which they were trained, and that attending a two-year college could have reduced the prospects of educational and social mobility for the disadvantaged. Monroe (1972) reported that articulation problems remained



in transferring occupational, remedial, and general studies. Walton (1984) also found that the majority of four-year institutions did not accept the Associate in Arts and the Associate of Applied Science degrees without evaluating courses individually. Prager (1988) wrote that transfer education should be refocused to include all who seek to transfer, regardless of their academic track.

Medsker (1960) found that retention rates for transfer students were markedly lower than for native students. The grade point averages of students usually dropped after transfer, but the drop was relatively small and the grade point averages improved. Kintzer and Wattenbarger (1985) reported an exception in Illinois where Associate in Arts and Associate in Science graduates performed better than native students. Other problem areas identified by Palmer (1986) included identifying potential transfer students, tracking them, and providing information for students. Social disadvantage impeded community college students from transferring, and few from poor academic and economic backgrounds transferred, according to Lee and Frank as reported by Watkins (1990, January 17).

### Transfer Changed

The concept of transfer has changed. Kintzer (1983) stressed that transfer could no longer be considered only in terms of linear progression from community colleges to

four-year institutions. Kintzer identified six categories of transfer: articulated vertical, lateral, international, and nontraditional (stop outs, industry, government, and experimental learning). In one study, 25% of students in community colleges had attended four-year institutions, and 10% had at least baccalaureate degrees according to Cohen and Brawer (1989). They observed that more students appeared to have transferred to universities from career education programs than from college-parallel programs since the mid-1970s. Prager (1988) also observed that 50% or more of all community college transferees since 1970 had come from occupational-technical programs. Prager reported the contract major approach that transferred the associate degree in as the full major, while the capstone program transferred the full technical degree toward a baccalaureate degree. De Los Santos and Wright (1989) found that 45.5% of the Maricopa County Community College district students had attended other postsecondary institutions. In Florida by 1988, the community colleges had become the primary provider of freshman and sophomore education. Brint and Karabel (1989) reported that almost 54% of the first-time freshman enrolled in two-year colleges.

#### Aviation Education Program Articulation

Aviation education programs were rarely mentioned in articulation and transfer literature. Yet, aviation

education programs were offered by more than 370 higher education institutions, both two-year and four-year institutions, according to the Collegiate Aviation Directory (1989). Reporting on notable programs, Adelman and Reuben (1984) presented an Aviation Administration program that led to the Bachelor of Professional Studies that awarded certain FAA employees 34 credit hours for their experience and learning. At least 481 faculty members were involved in aviation education, according to Bowen (1990).

The Airway Science Curriculum Committee urged community colleges to make articulation agreements with four-year institutions having Airway Science Curricula. The community college students should be advised to complete associate degrees, but not in aviation. The Airway Science Program certainly did not have the impact on aviation education comparable to that of the Civilian Pilot Training Program. The Council on Aviation Accreditation (1990) developed the Accreditation Standards Manual for four-year programs, and will consider associate and graduate programs later.

Federal Aviation Regulation Part 61 listed the requirements for pilot certificates, and Part 65 listed the requirements for aviation mechanic certificates. Part 141 regulated Pilot Schools while Part 147 covered Aviation Maintenance Technician Schools. These regulations provided for transfer among the schools.

### The Future

Parnell (1988) predicted that every state will have developed coherent transfer agreements by 2010.

## CHAPTER III

### METHODOLOGY

#### Introduction

The purpose of the study was to determine ways to improve the articulation and transfer for aviation students graduating from two-year colleges and continuing toward aviation baccalaureate degrees in Oklahoma universities. In order to do this, it was necessary to determine the status of aviation program and course offerings at Oklahoma colleges and universities. The fall semester of 1990 was selected as the time of reference for this data. After collecting data for the fall 1990 semester, a content analysis was accomplished to determine the aviation curriculum content. Limitations and guidelines were determined from sources such as the Oklahoma State Regents for Higher Education policies. Next, aviation programs were compared to determine which programs might be better articulated. Finally, recommendations to improve articulation and transfer among Oklahoma colleges and universities were made.

### Preliminary Procedures

All of the 47 Oklahoma colleges and universities, public and private, were contacted to obtain current catalogs and schedules for the fall semester of 1990. These documents were reviewed to determine which institutions offered aviation courses and programs. A list of the 47 colleges and universities in Oklahoma is in Appendix A.

Information about research and recent developments concerning articulation and transfer of aviation students between two- and four-year higher education institutions was solicited nationally through a request published in the UAA Newsletter. The UAA Collegiate Aviation Directory was an important source of information.

A content analysis was employed to study the aviation curricula information available from catalogs and schedules. The goals established for the catalog and schedule content analysis for each of the Oklahoma higher education institutions were as follows: (a) to determine if aviation courses or aviation programs were offered, (b) to determine if there were aviation majors and minors offered, (c) to determine if aviation degrees were awarded, (d) to determine aviation degree requirements, and (f) to determine restrictions and limitations on articulation and transfer. It was apparent that it would be beneficial to contact each of the institution aviation heads or coordinators to confirm the accuracy of the information obtained from catalogs and

schedules. A questionnaire was the chosen instrument to improve consistency and efficiency during these interviews. A questionnaire was developed to obtain articulation and transfer data for each of the aviation programs in the study. A copy of the questionnaire is shown in Appendix B.

### Operational Procedures

The content analysis of the catalog and schedule for each of the 47 Oklahoma institutions of higher education began with a review of the catalog to determine if an aviation program or course was offered. Next the schedule was reviewed to determine if any course directly related to aviation was included. The possibility that aviation courses were offered as community service or adult education courses without any catalog reference was explored. Next the UAA Collegiate Aviation Directory was compared to information obtained from catalogs and schedules. These differences were then examined. All of the institutions offering any aviation course are listed in Appendix C. The catalogs were researched for aviation programs that would include program majors, associate degrees, and baccalaureate degrees. Appendix D lists the institutions that offered associate degree aviation education programs while Appendix E lists the institutions that had baccalaureate degree aviation education programs. The aviation program head or

coordinator of each institution offering an aviation program was requested to review a description of the program.

The author developed a draft questionnaire which was presented to the doctoral committee chairman for evaluation. Others who were involved in the development and evaluation of the questionnaire included the Institute for Aviation Research, the University Aviation Association, the National Intercollegiate Flying Association, and the FAA. Directors of aviation programs outside of Oklahoma provided a pilot group to evaluate the usability of the questionnaire. A copy of the interview questionnaire used in this study is in Appendix B.

The questionnaire was used to obtain the needed information from each of the aviation program heads or coordinators of institutions of higher education in Oklahoma. The preferred method of survey was a personal interview conducted on the campus of the aviation program. However, where personal interviews were impossible, telephone interviews were completed after the author had visited the campus. When a campus visit was impossible to schedule, the needed information was obtained by telephone only.

#### Research Design and Analysis

The findings of this study were presented in a descriptive format with both qualitative and quantifiable



data presented. Findings included details of each aviation program curriculum. This included both major studies in aviation and schools that offered at least one aviation course. The survey methodology provided new discovery, clarification, and insight into the articulation and transfer considerations that simply were not available in published materials. Findings were reported in summation to avoid identifying the sources. All data were used as a basis to form conclusions and recommendations for action.

The conclusions and recommendations are presented in a descriptive and summative format. This information provides a self-supporting overview of the entire research endeavor.

## CHAPTER IV

### FINDINGS AND DISCUSSION

#### Introduction

The purpose of this chapter was to present the content analysis of catalogs and schedules of Oklahoma colleges and universities that offered aviation programs. New discovery obtained from the survey was presented and analyzed. The goal of this research was to determine the content of the Oklahoma collegiate aviation programs existing in the fall semester of 1990. Upon the determination of the current status of the Oklahoma collegiate aviation programs, the programs could be compared for the feasibility of developing articulation agreements among institutions. Emphasis was on articulation and transfer between the two-year and four-year programs.

The goal of this chapter was to present data upon which recommendations could be based to improve the articulation and transfer of aviation students among institutions of higher education located in the state of Oklahoma.

## Baccalaureate Degree Programs

### Northeastern State University

Northeastern State University offered nine aviation courses within the Division of Technology. This division offered degrees of Bachelor of Science, and Bachelor of Science in Education. Aviation was not listed as one of the major fields for the Bachelor of Science degree, however Industrial Technology was listed. (Northeastern State University, 1990-91, pp. 74, 289).

Northeastern State University offered the aviation courses to provide the, "student with another tool in the pursuit of their chosen career." (Northeastern State University, 1990-91, p. 289). The aviation courses included 1113 Ground School Instruction; 1213 In-Flight Training; 2333 Commercial Pilot Ground School; 3143 Commercial In-Flight Training; 3413 Instrument Pilot Ground School; 4113 and 5113 Instrument Pilot In-Flight Training; and 4210 and 5210 Aerospace Education Workshop. The catalog indicated that the last two courses (Instrument Pilot In-Flight Training, and Aerospace Education Workshop) could be taken either as senior-level courses or as graduate or professional-level courses. The courses offered would provide the student the opportunity to earn a FAA Commercial Pilot certificate with an Instrument Rating.

Oklahoma State University

Oklahoma State University offered a Bachelor of Science in Aviation Sciences in the College of Education requiring a minimum of 124 semester hours. (Oklahoma State University, 1990-1991, pp. 67-70). Also, Oklahoma State University offered a Master of Science degree in Natural and Applied Sciences with an option of Aviation and Space Sciences. Only the baccalaureate degree was considered in this study. The major requirements of 40 hours included 21 hours of Professional Requirements. The remaining 19 hours of the major could be taken in one of four options: Aircraft Systems Management, Airway Science Management, Airway Computer Science, or Human Resources. Sixty-three hours of general education were required. (Oklahoma State University College of Education, 1990-1991, p. ED-1). A minimum of one-half of the upper division requirements in the student's major must be earned in residence. At least 30 hours must be taken in residence including the last 18 hours. (Oklahoma State University, 1990-1991, pp. 26-32).

The Professional Requirements included 1113 Theory of Flight and 1222 Flight Training which would enable the student to earn a private pilot certificate. There were three other Aviation and Space Education (AVSED) required courses: 3443 Introduction to Aviation Law, 3663 Air Transportation, and 4113 Aviation Safety. The remaining Professional Requirements included MSIS 2103 Business

Computer Concepts and Applications; and PHYSC 1014 Descriptive Physics, or PHYSC 1114 General Physics.

The Aircraft Systems Management option provided the student with a commercial pilot certificate. Designed for the professional pilot, these courses included 2122 Secondary Flight; 2332 Intermediate Flight; 3223 Advanced Theory of Flight which prepared the student for the commercial written test; 2663 Air Traffic Control; 3233 Theory of Instrument Flight which was preparation for the instrument written test; 3331 Theory of Multiengine Flight; 3333 Advanced Aircraft Systems; 3442 Advanced Flight; 3551 Multiengine Flight Lab; 3553 General Aviation Management; 3562 Flight Instructor: Airplanes; 4100 Special Studies in Aviation; GEOG 3033 Meteorology; MPT 3553 Gas Turbine Powerplant; and five hours from the following: AVSED 3441 Aerobatic Flight Lab, AVSED 3661 Flight Instructor: Instruments, AVSED 4200 (4 hours) Internship in Aviation, or AVSED 4771 Flight Instructor: Multiengine. (Oklahoma State University College of Education, 1990-1991, p. ED-1).

The Oklahoma State University Airway Science Management option required four Aviation and Space Education courses: 2633 Air Traffic Control and the National Airspace System, 3553 General Aviation Management, 4100 (3 hours) Specialized Studies in Aviation, and 4200 (3 hours) Internship in Aviation. This option, designed for aviation managers, required ABSED 3013 Leadership Concepts, BCOMM 3223

Organizational Communication, BUSAD 4513 Strategic Management and Business Policy, MGMT 3223 Prod & Operations Mgmt, MGMT 3243 Managerial Decision Theory, MGMT 4123 Labor Management Relations, PSYCH 2313 Psychology and Human Problems, and SPCH 2713 Introduction to Speech Communication. Additionally, four hours of controlled electives could be taken from any option. (Oklahoma State University College of Education, 1990-1991, p. Ed-1).

The Oklahoma State University Airway Computer Science option required two Aviation and Space Education courses: AVSED 4100 (3 hours) Special Studies in Aviation, and 4200 (3 hours) Internship in Aviation. Three Management courses were required: MSIS 2103 Business Computer Concepts and Applications, MSIS 3103 Computer Programming for Business, and MSIS 4443 Computer-based Simulation Systems. The remaining courses were Computer Science courses which included 2123 Computer Science I, 2133 Computer Science II, 2203 Discrete Mathematics I, 3213 Microcomputer Principles and Applications, 3443 Computer Systems, 4323 Operating Systems I, 4344 Data Structures and Information Processing, and 4363 Organization of Programming Languages. (Oklahoma State University College of Education, 1990-1991, p. ED-1).

The fourth option offered by Oklahoma State University was Human Resources. The only Aviation and Space Education courses required beyond the Professional Requirements were AVSED 4100 (2 hours) Specialized Studies in Aviation, and

AVSED 4200 (2 hours) Internship in Aviation. Taken from seven other disciplines, the following courses were required for this option: ABSED 3213 Psychology of Adolescence, or ABSED 3413 Child and Adolescent Development; GENT 1103 Industrial Materials; GENT 1113 Essentials of Mechanical and Architectural Drafting; GENT 2323 Statics; MECDT 1223 Computer-aided Drafting and Design; MECDT 4013 Computer-aided Design; MPT 2113 Power Transmission Systems, MPT 2313 Fundamentals of Hydraulic Fluid Power; OAED 3012 Analysis and Assessment of Training Needs; OAED 3113 Foundations of Occupational Education; TECED 3103 Introduction to Technical Education; and TIED 4214 Safety, Organization and Management of Learning Facilities. (Oklahoma State University College of Education, 1990-1991, p. ED-1).

#### Phillips University

Phillips University offered a baccalaureate degree in Business Administration with a major in Aviation Management (B.S.B.Ad.). This required certification as an Air Traffic Controller with at least two years experience. An internship was required as well as previous Air Force training and/or college-level schooling. (Phillips University, 1989-91, pp. 61-62). No aviation courses were taught at Phillips University. Instead, the student completed the business and management courses as well as the

general education courses to round out the education already received through experience as an Air Traffic Controller. The student must take 33 hours in the major in addition to the Air Traffic Controller education and experience. These 33 hours included ACC 2013 Introductory Accounting I; ACC 2023 Introductory Accounting II; ECO 2013 Intro to Macroeconomics; ECO 2023 Intro to Microeconomics; FIN 3113 Fundamentals of Finance; MGT 4473 Business Policies; and MKT 3013 Principles of Marketing. Additionally, three hours of management electives and nine hours of business electives were required. The baccalaureate degree required a minimum of 128 semester hours. At least 40 must be junior and senior-level courses. The final 30 hours, or 45 of the last 60 hours, must be taken in residence. The general education requirements included 45 hours in addition to general education requirements established by the academic division. (Phillips University, 1989-91, pp. 40-43).

#### Southeastern Oklahoma State University

Southeastern Oklahoma State University offered two baccalaureate degrees in the Aerospace Department: Aviation, and Airframe and Powerplant. A minimum of 124 semester hours was required of which 50 hours must be general education. Fifty percent of the major must be upper-division. Two minors of 15 semester hours each were required, or a second major was required. Options A and B



were offered in the Aviation B.S., and met the requirements of the major and one of the two required minors. Option A took the student through the Commercial Pilot and Flight Instructor certificates, and could include the Airline Transport Pilot preparation. (Southeastern Oklahoma State University, 1989-91, pp. 55-56).

Only three of the flight training courses were at the freshman or sophomore level: 1004 Primary Ground Instruction to prepare for private pilot written test; 1041 Private Flying; and 2083 Advanced Ground Instruction I to prepare for commercial pilot written test. Therefore only eight of the fifty-two hours required for the aviation degree were lower division courses. Additionally, one-third of the required flight credit hours must be accomplished in residence, and the last two flight courses must be accomplished in residence. Within Option A, there were two options. Option 1 required eight flight credit hours: 1041 Private Flying; 3164 Commercial Flying; 3321 Instrument Flying; 3241 Flight Instructor Flying; and 3401 Instrument Flight Instructor. The last two courses represented only one-fourth of the required flight credit hours. Therefore a transfer student who had earned a commercial pilot certificate at a two-year college could not meet the one-third flight credit hours residency requirement by taking the last two courses: Flight Instructor Flying, and

Instrument Flight Instructor Flying. (Southeastern Oklahoma State University, 1989-91, pp. 55-58).

Option 2 of Option A also required eight flight credit hours: 1041 Private Flying; 3164 Commercial Flying; 3321 Instrument Flying; 4601 Multi-engine Flying; and 4801 Airline Transport Rating Flying. As was the case with Option 1, the last two flying courses constituted only one-fourth of the required flight credit hours. Option B, Corporate Education, of the Aviation B.S. required seven flight credit hours; 1041 Private Flying; 3164 Commercial Flying; 3321 Instrument Flying; and 4601 Multi-Engine Flying. As with Option A, more than two hours in residence was needed to satisfy the requirement of one-third of the required flight credit hours in residence. The University could convene a special committee to establish a flight curriculum to meet the one-third residency requirement for a student who exceeded the two-thirds maximum flight credit hours at the time of application to the aviation program. (Southeastern Oklahoma State University, 1989-91, pp. 55-58).

Southeastern Oklahoma State University's Airframe and Powerplant B.S. provided management instruction for the student who had previously earned FAA Airframe and Powerplant certification. (Southeastern Oklahoma State University, 1989-91, pp. 55-57). This major-minor combination required 64 semester hours. Advanced standing

credit could be awarded for approximately 29 hours. However, comprehensive written and practical examinations were required with a minimum score of 80%. The additional Airframe and Powerplant courses, totaling 13 hours, included 3393 Maintenance Supervisor; 4453 Inspection Authorization; 4483 Electronic Technician Management/Utilization; and 4514 Technical Lab Problems. Twenty-two hours of courses were required in Business Administration, Management, and Accounting, of which fifteen were upper division. In the 1990 fall schedule, the only Airframe and Powerplant course listed was 3393 Maintenance Supervisor. (Southeastern Oklahoma State University, Fall 1990, p. 16).

#### Southern Nazarene University

Southern Nazarene University offered a Bachelor of Science Degree in the School of Business with an aviation-business concentration. A basic core consisted of 42 hours (from accounting, business, computer science, economics, management, marketing, and statistics) and specialized subjects from one of seven areas (accounting, aviation-business, business administration, business education, management, marketing, and office administration). For the aviation-business concentration pattern, the total required courses in aviation included 19 hours with three hours of optional aviation courses. (Southern Nazarene University, 1989-1991, pp. 101-104).

The 19 hours of required aviation courses included three ground instruction courses (Primary, Commercial, and Instrument), and four flying courses (Private, two Commercial courses, and Instrument). Only Primary Ground Instruction and Private Flying were lower division courses and totaled six hours. The other required courses were at the junior level, while two optional courses (Certified Flight Instruction, and Multiengine Flying) were senior level courses. (Southern Nazarene University, 1989-1991, p. 102). The fall semester 1990 schedule offered all the required courses plus the optional courses. (Southern Nazarene University, 1990-91, p. 11).

Southern Nazarene University required a minimum of 124 hours and a major concentration of at least 50 hours. Forty hours of credit must be upper division. A minimum of thirty hours of residence credit was required and fifteen of the last thirty hours must be in residence. (Southern Nazarene University, 1989-1991, pp. 63-71).

#### University of Oklahoma

The University of Oklahoma offered aviation as a special program in the College of Education. The 1988-1990 Bulletin indicated that Professional Studies in Education, under which the Aviation Program was listed, were projected for discontinuation. The faculty indicated that this has changed. The twelve courses in aviation covered private,

commercial, instrument, multiengine, flight instructor, instrument instructor, and multiengine flight instructor.

Seventeen hours were offered at the lower division level: 1114 Introduction to Aviation, 1255 Primary Flying, 2113 Instrument Flight Procedures and Techniques, 2122 Secondary Flying, 2232 Advanced Flying, and 2581 Multiengine Flying. To complete the FAA requirements for a commercial certificate with an instrument rating, the student would need three upper division level courses: 3113 Commercial Aviation, 3552 Commercial Flying, and 4573 Instrument Flying. Instructor courses were also upper division: 4112 CFI Seminar; 4603 Flight Instructor - Airplane; 4613 Instrument Flight Instructor; and 4622 Multiengine Flight Instructor. Course 4990, Special Studies in Aviation, encompassed aviation-related studies including specialty flight programs. (University of Oklahoma, 1988-1990, p. 230). The catalog indicated that the student in the aviation program selected any college within the University to pursue a degree program that conformed with his or her own professional and personal objectives. The Aviation major was offered through the College of Education.

The University of Oklahoma required a minimum of 124 hours for the Bachelor of Science degree majoring in Professional Studies in the Aviation Track. Forty-five of the last sixty hours must be in residence, or the last thirty consecutive hours must be in residence. A minimum of

thirty hours of specialized education in aviation was required in this program. Transfer credit for this specialized education would only be accepted from a FAA Approved Part 141 program. Thirty hours of professional education was also required. (University of Oklahoma College of Education, 1990, pp. 1-2).

#### University Center at Tulsa

The Aviation Science Bachelor of Science program offered at the University Center at Tulsa was provided by Oklahoma State University. The courses and degree were identical with the program offered on the main campus at Stillwater.

Universities offering baccalaureate degrees in aviation are listed in Table I.

TABLE I  
OKLAHOMA UNIVERSITIES OFFERING BACCALAUREATE  
DEGREES IN AVIATION

Institution	Degree	Major
Oklahoma State University Stillwater, OK	BS	Aviation Sciences
Phillips University Enid, OK	BS	Aviation Management for Air Traffic Controllers
Southeastern Oklahoma State University Durant, OK	BS	Aviation, and Airframe & Powerplant
Southern Nazarene University Bethany, OK	BS	Business
University Center at Tulsa Tulsa, OK	BS	Aviation Sciences (through OSU)
University of Oklahoma Norman, OK	BS	Professional Studies Aviation Track

All of the universities that offered aviation baccalaureate programs awarded Bachelor of Science degrees to graduates of these programs. Most of the titles of the majors referred to aviation. Southern Nazarene University offered a Bachelor of Science degree from the School of Business with a concentration in Aviation-Business.

The requirements for the Oklahoma aviation baccalaureate degree programs are listed in Table II.

TABLE II  
OKLAHOMA AVIATION BACCALAUREATE DEGREE  
PROGRAM REQUIREMENTS

University	Hour Req	Gen Ed	Major Hours	Upper Div	Residence Req	Remark
Oklahoma State University	124	63	40	40	Half Upper Division 30 Hours Last 18	Trans- fer Part 141. Only 9 hours of avia. lower div. hours
Phillips University	128	45+ Div Req	33+ ATC Cont- rol- ler	40	Last 30, or 45 of last 60 hours	ATC con- trol- ler + 2 yrs exper.
Southeast- ern Oklahoma State University	124	50	52 AV 64 A&P	40	Third of program. Last 2 flight courses.	Only 8 hours avia. lower div.
Southern Nazarene University	124	46- 51	42+ 19	40	30 & 15 of last 30	
University Center at Tulsa	124	63	40	40	Same as OSU	Same as OSU



TABLE II (Continued)

University	Hour Req	Gen Ed	Major Hours	Upper Div	Residence Req	Remark
University of Oklahoma	124	55	30 Av 30 Prof	40	Last 30 or 45 of last 60 hours	Trans- fer must be Part 141

The Oklahoma aviation baccalaureate degree programs required a minimum of 124 semester hours except for the Phillips University aviation program which required 128 semester hours. All aviation programs required more than 45 semester hours of general education while Oklahoma State University and the University Center at Tulsa had the highest minimum general education requirements of 63 semester hours. The minimum requirements for the aviation majors ranged from 33 semester hours to 64 semester hours with the median of approximately 52 semester hours. All required a minimum of 40 hours of upper-division level courses. All required at least 30 semester hours in residence.

#### Associate Degree Programs

Aviation programs that led to associate degrees granted by colleges located in Oklahoma are described in the following sections.

Northeastern Oklahoma A & M College

Northeastern Oklahoma A & M College offered an Aviation major leading to an Associate in Applied Science degree. The degree required 65 hours and was offered by the Health Science and Technology Division. Both flight instruction courses and basic aviation theory courses were contained in the curriculum. The program was also designed to fill the aviation objectives and needs of students who majored in other fields. The aviation degree program required 20 hours of general education while the program requirements totaled 43 hours including 29 technical-occupational hours plus technical support and related courses. (Northeastern Oklahoma A & M College, 1990-92, p. 148).

Eight aviation courses were offered and all were required for completion of the Associate in Applied Science degree program. The aviation courses included 1011 Instrument Proficiency; 1103 Introduction to Aviation and Aerospace; 1113 Basic Ground School, and 1112 Basic Flight Training which led to the private pilot certificate; 1122 Instrument Flight Training; 1123 Instrument Ground School; 2222 Intermediate Flight Training; 2223 Advanced Ground School to prepare for the commercial pilot written test; and 2232 Advanced Flight Training. Completion of these courses could result in the student earning a commercial pilot

certificate with an instrument rating. (Northeastern Oklahoma A & M College, 1990-91, pp. 148, 171-172).

### Oklahoma City Community College

Oklahoma City Community College offered an Associate in Applied Science degree in Aviation Maintenance Technology. This was a cooperative program with Metro Tech Aviation Career Center, located on the northwest part of Will Rogers World Airport in Oklahoma City. A part of Vo-Tech, the Metro Tech Aviation Career Center had a FAA Part 147 approved aviation mechanic school where students could begin without prior experience, and earn FAA Aviation Mechanic certificates with Airframe and Powerplant ratings. (Oklahoma City Community College, 1990-91, p. 58).

The Aviation Maintenance Technology program required a minimum of 61 semester hours of which 19 hours were general education courses in communications, mathematics, history, political science, and physics. The support courses were MGMT 2953 Supervisory Training, and CS 1113 Introduction to Computers and Applications. These courses were taught on campus. The major courses consisted of 36 hours of Aviation Maintenance courses: 1113 Fundamentals of Aviation Maintenance; 1123 Technical Mechanics and Regulations; 1212 Basic Aircraft Electronics; 1224 Airframe and Powerplant Electrical Systems; 1313 Aircraft Structures I; 1323 Aircraft Structures II; 2114 Airframe Systems I; 2122

Airframe Systems II; 2214 Reciprocating Engines I; 2222 Reciprocating Engines II; 2312 Jet Turbine Powerplant I; and 2324 Jet Turbine Powerplant II. All of these major courses were taught at the Metro Tech Aviation Career Center and required special admissions procedures. (Oklahoma City Community College, 1990-91, p. 58). This program was being phased out but another program in aviation manufacturing was being developed with Francis Tuttle Vo-Tech.

Oklahoma State University - Oklahoma City

Oklahoma State University - Oklahoma City, offered an Associate in Applied Science degree majoring in Aviation Electronics Technology. This program led to jobs such as engineering assistant, installation or maintenance technicians, calibration technicians, and to a position as a member on a technical team in research and development. The program required a total of 68 semester hours of which 22 were general education including math through calculus for technical programs. (Oklahoma State University - Oklahoma City, 1990-91, p. 60).

The Aviation Electronics Technology program required 46 semester hours in electronics engineering (EET) and aviation electronics (AVET). The electronics engineering courses consisted of 1104 Fundamentals of Electricity; 2101 Electronic Construction and Design; 2103 Electronic Instruments; 2224 Electronic Amplifiers I; 2244 Circuit

Analysis; 2373 Digital Logic Analysis; and 2454 Electronic Computers. The aviation electronics courses consisted of 1103 Theory of Flight; 2103 Aircraft Instruments; 2104 Aircraft Communications Systems; 2113 Aviation Computer Programming; 2203 Auto Pilot/Instrument Landing Systems; 2204 Aircraft Navigational Systems; and 2213 Radar, Altimeters and Pulse Equipment. (Oklahoma State University - Oklahoma City, 1990-91, p. 60). The program had not been implemented due to lack of funding, according to the faculty.

#### Rogers State College

Rogers State College offered two aviation degrees: an Associate of Applied Science in Aircraft Maintenance Management and an Associate of Science in Aviation. Each required a total of 60 semester hours.

The Aircraft Maintenance Management program required a minimum of 60 semester hours which included 18 hours of aircraft maintenance management courses, and 15 hours of support and related course work in management, accounting, business, and cooperative education, as well as 18 hours of general education. The 27 hours of Aircraft Maintenance Management (AMM) courses included 2144 Aircraft Electrical and Avionics Systems; 1113 Federal Aviation Regulations; 1114 Airframe Systems; 1104 Aircraft Engineering Technology I; 1134 Flight Line Maintenance; 2124 Aircraft Engineering

Technology II; and 2134 Powerplants and Accessories. There was no mention of meeting the requirements for the FAA Aviation Mechanic Certificate. (Rogers State College, 1990-1991, p. 67, 144). However, the schedule for the fall of 1990 stated that the program prepared students for the FAA license.

The Associate of Science degree with emphasis in Aviation was a transfer program and contained 38 hours of general education of the required minimum 60 semester hours. The program requirements included 11 hours consisting of the following aviation courses: 1113 Theory of Flight; 2223 Commercial Pilot Ground School; 1222 Flight Training; and 2323 Instrument Pilot Ground School. Eleven hours of support and related courses were also required. These hours could be selected from 17 courses including two from aviation; two from economics; two from accounting; one from business management and administration; two from chemistry; two from computer science; two from cooperative education; one from geography; and three from physics. (Rogers State College, 1990-1991, pp. 72-73). This program provided the student the opportunity to earn at least a private pilot certificate.

No Aircraft Maintenance Management courses were offered in the fall of 1990 schedule. Advanced standing was offered to licensed mechanics toward a management degree. Three aviation courses were offered in the fall of 1990, and these

three courses were conducted on the Catoosa High School campus. (Rogers State College, Fall 1990, p. 3, 14).

### Rose State College

Rose State College offered two Associate in Applied Science degrees which were Aviation: Mid-Management Option; and Aviation: Professional Pilot Option. (Rose State College, 1990-92, p. 115-116). These programs were offered through the Engineering and Science Division.

The Aviation: Mid-Management Option contained 71 credit hours including 23 hours of general education, 15 hours of aviation, three hours of management, six hours of economics, three hours of engineering technology and three hours of mathematics. Support and related courses included Introduction to Computers, Personnel Management, and 12 hours of electives from accounting, business, mathematics, and mid-management. The 12 hours of electives may be taken from aviation, engineering technology, or science. The 15 hours of required aviation courses included 1015 Private Pilot Ground School; 2033 Aviation Law; 2123 Aviation History; and 2134 Aviation Management. If approved, the student with the appropriate practical experience could take three courses to prepare to take the FAA written tests required for the Aviation Mechanic certificate. These courses were 2712 A/P General License; 2714 A/P Airframe

License; and 2724 A/P Powerplant License. (Rose State College, 1990-92, p. 115, 189-192).

The Aviation: Professional Pilot Option program required a total of 73 credit hours including 20 hours of general education, 32 hours of aviation program requirements, and 21 hours of support and related requirements. The required aviation courses consisted of 1015 Private Pilot Ground School; 2243 Commercial Pilot Ground School; 2414 Instrument Pilot Ground School; 1025 Pilot Flight Training; 1134 Commercial Pilot Flight Training I; 2332 Commercial Pilot Flight Training II; 2443 Instrument Flight Training; 2424 Basic Instrument Flight Simulation; and 2442 Advanced Instrument Flight Simulation. The support and related requirement of 21 hours also included nine hours of aviation courses: 2433 Navigation and Instrument Flight Planning; 2033 Aviation Law; and 2233 Aircraft Powerplant and Related Systems. (Rose State College, 1990-92, p. 116).

Flight training could be arranged in two ways. The student could arrange for his own flight instruction and aircraft rental. For a special fee, Rose State College selected an approved vendor who provided the flight training.

#### Spartan School of Aeronautics

A proprietary technical/trade school, Spartan School of Aeronautics offered the Associate in Applied Science degree



as well as certificates and diplomas. Associate in Applied Science degrees were available in Aviation Maintenance, Airframe and Aviation Electronics (Avionics), Aviation Maintenance with Helicopter specialty, Aviation Instruments, Communication Technology, Quality Control, Aviation Electronics (Avionics), and Aviation Instrument/Electronics (Avionics). No associate degree was offered in the Flight Programs in the fall of 1990. (Spartan School of Aeronautics, 1990, p. 7).

Although Spartan School of Aeronautics operated on the quarter system, credit was awarded in semester credit hours. Associate in Applied Science degrees required five general education courses: 1113 Composition I; 1173 American History: 1877 to present; 1183 American Federal Government; 1124 Technical Math; and 1134 Technical Physics. Total credit hours for the programs ranged from 79 credit hours to 154 credit hours. The Quality Control Technician Associate in Applied Science degree program, the shortest of Spartan's degree programs, required five quarters of study while the longest, Airframe and Aviation Electronics (Avionics) Technician, required ten quarters of study. Most of the associate degrees required slightly more than 100 credit hours. (Spartan School of Aeronautics, 1990, pp. 8-15, 27).

Graduates of these programs should have strong technical knowledge and skills. Transferring to

baccalaureate programs, however, could require considerable amounts of lower-division general education courses.

#### Western Oklahoma State College

Western Oklahoma State College offered two aviation programs: Airport Management, and Aviation. Both of these programs led to Associate in Applied Science degrees, were designed for immediate job entry, and required 60 semester hours.

The Airport Management program required at least 29 hours of technical occupational courses in addition to 17 hours of general education, eight hours of support courses which were usually general education, and six hours of related courses from aviation, management, and business. The required 29 hours of technical occupational courses included the following: AVIA 1333 Airport Management; BUS 1113 Introduction to Business; AVIA 1313 Private Pilot Ground School; AVIA 2333 Advanced Airport Management; MGMT 1323 Principles of Marketing; AVIA 1323 Commercial Pilot Ground School; AVIA 2533 Flight School and Air Taxi Operations; MGMT 2023 Personnel Management; ACCT 2103 Principles of Accounting I; and AVIA 1513 Basic Ground School Instructor. (Western Oklahoma State College, 1990-91, pp. 36).

The Airport Management (Maintenance Emphasis) option was similar but provided a student who already had the

appropriate experience the opportunity to earn a FAA Aviation Mechanic certificate with Airframe and Powerplant ratings. The general education, support, and related courses were the same. The technical occupational specialty courses were as follows: AVIA 2833 Airframe Mechanic; AVIA 2723 Aviation Mechanic General; AVIA 2733 Powerplant Mechanic; AVIA 2842 Airframe Practical; AVIA 2742 Powerplant Practical; AVIA 1333 Airport Management; AVIA 2333 Advanced Airport Management; BUS 1113 Introduction to Business; MGMT 2213 Principles of Management; MGMT 1323 Principles of Marketing; and ACCT 2103 Principles of Accounting I. (Western Oklahoma State College, 1990-91, pp. 36).

The Aviation program also had 17 hours of general education, eight hours of support courses, and six hours of related courses as well as a minimum of 29 hours of technical-occupational specialty requirements. The aviation courses included 1333 Airport Management; 1313 Private Pilot Ground School; 2333 Advanced Airport Management; 2533 Flight School and Air Taxi Operations; and 1513 Basic Ground School Instructor. The remaining 14 hours were approved courses from Aviation, Business, and Management. There were three additional aviation program options for commercial pilot, flight instructor, and aviation mechanic. (Western Oklahoma State College, 1990-91, pp. 37,38, 53-56).

The Aviation (Commercial Pilot Option) program contained the same general education and support courses

requirements. The six hours of related courses included Airport Management and Advanced Airport Management. The 29 hours of technical-occupational courses were all aviation courses and included 1313 Private Pilot Ground School; 1202 Private Pilot Lab; 2861 Private Pilot Simulator Lab; 1323 Commercial Pilot Ground School; 1212 Commercial Pilot Lab I; 2881 Commercial Pilot Simulator Lab; 2533 Flight School and Air Taxi Operations; 2343 Instrument Pilot Ground School; 1222 Commercial Pilot Lab II; 2891 Commercial Pilot Simulator Lab Continued; 1513 Basic Ground School Instructor; 2871 Instrument Pilot Simulator Lab; 1232 Commercial Pilot Lab III; 2112 Instrument Flying Lab; and 2891 Instrument Pilot Simulator Lab Continued. (Western Oklahoma State College, 1990-91, pp. 37, 53-56).

The Aviation (Flight Instructor Option) program was almost identical with the commercial pilot option with two differences. AVIA 2523 Flight Instructor Ground School was required instead of AVIA 1513 Basic Ground School Instructor. AVIA 2852 Flight Instructor Lab was required instead of 2533 Flight School and Air Taxi Operations that became an optional related course. (Western Oklahoma State College, 1990-91, p. 38).

The final program was Aviation (Mechanic Option) which also required 17 hours of general education, eight hours of support courses, and six hours of related courses. There were five technical occupational required aviation courses:

2833 Airframe Mechanic; 2723 Aviation Mechanic General; 2733 Powerplant Mechanic; 2842 Airframe Practical; and 2742 Powerplant Practical. The remaining 16 hours of technical occupational courses were approved from Aviation, Business, and Management courses. (Western Oklahoma State College, 1990-91, p. 38).

Oklahoma colleges that offered aviation associate degree programs in the fall semester of 1990 are listed in Table III.

TABLE III  
OKLAHOMA COLLEGES OFFERING ASSOCIATE  
DEGREE PROGRAMS IN AVIATION

Institution	Type	Major
Northeastern Oklahoma A & M College Miami, OK	AAS	Aviation
Oklahoma City Community College Oklahoma City, OK	AAS	Aviation Maintenance Technology
Rogers State College Claremore, OK	AAS	Aircraft Maintenance Management
	AS	Aviation
Rose State College Midwest City, OK	AAS	Aviation: Mid-Management Option
	AAS	Aviation: Professional Pilot Option

TABLE III (Continued)

Institution	Type	Major
Spartan School of Aeronautics Tulsa, OK	AAS	Aviation Maintenance; Airframe and Aviation Electronics (Avionics); Aviation Maintenance with Helicopter Specialty; Aviation Instruments; Communication Technology; Quality Control; Aviation Electronics (Avionics); Aviation Instrument/ Electronics (Avionics)
Western Oklahoma State College Altus, OK	AAS	Airport Managment
	AAS	Aviation

All of the colleges in Oklahoma that offered aviation associate degree programs led to Associate in Applied Science degrees except for Rogers State College which offered an Associate in Science degree with a major in Aviation. The titles of the aviation majors included Aviation, Maintenance, and Airport Management.

Oklahoma aviation associate degree program requirements are shown in Table IV.

TABLE IV  
ASSOCIATE DEGREE PROGRAM REQUIREMENTS

College	Type Deg.	Hours Req.	Gen. Ed.	Major Hours	Remarks
Northeastern Oklahoma A&M College	AAS	65	20 +8	29	Led to commercial & instrument. Part 141
Oklahoma City Community College	AAS	61	19 +3	36	Led to aviation mechanic
Rogers State College	AAS	60	18 +8	27	Aviation mechanic if had prior experience
	AS	60	38	11	Led to private pilot
Rose State College	AAS	71	23 +6	30	Aviation mechanic if had prior experience
	AAS	73	23 +3	32	Led to commercial & instrument
Spartan School of Aeronautics	AAS	79-154	17	62-137	Aviation mechanic FAA Part 147
Western Oklahoma State College	AAS	60	17 +8	29	Aviation mechanic if had prior experience
	AAS	60	17 +8	29	Led to commercial & instrument, ground & flight instructor. Part 141

Aviation associate degree program minimum required semester hours ranged from 60 to 154 hours with the median of approximately 65 hours. The minimum general education requirements for the Associate in Applied Science degrees ranged from 17 semester hours to 23 semester hours. The Associate in Science degree program required 38 semester hours of general education. The minimum requirements for the majors in the Associate in Applied Science degree programs ranged from 27 to 137 semester hours, while the minimum major requirements for the Associate in Science degree program was only 11 semester hours. Most of the programs could prepare the graduates for either pilot or mechanic certificates.

#### Aviation Courses

In addition to the colleges and universities that offered aviation programs leading to degrees, some institutions offered one or more aviation courses. Northeastern State University offered nine aviation courses and a minor within the Division of Technology. El Reno Junior College catalog for 1988-90 listed an Associate in Science degree majoring in Aviation with two aviation courses: AVIA 1113 Introduction to Aviation, and AVIA 1123 Flight Training. However, El Reno Junior College offered no aviation courses in the fall semester of 1990, but usually offered both aviation courses each spring semester. The



eight other colleges and universities that offered some aviation courses, but neither an aviation degree program nor a minor, included Carl Albert Junior College; Eastern Oklahoma State College; Northern Oklahoma College; Northwestern Oklahoma State University; Oklahoma Christian University; Panhandle State University; Southwestern Oklahoma State University; and Southwestern Oklahoma State University at Sayre.

Course titles and numbers varied greatly among institutions in Oklahoma offering aviation courses and programs. For example, the variety of titles of the course presenting the knowledge to prepare students for the private pilot written test included the following: Basic Ground School, Ground School Instruction, Introduction to Aviation, Primary Ground Instruction, Private Pilot Ground School, and Theory of Flight. Course numbers included 1004, 1015, 1113, 1114, and 1313.

Figure 1 presents a graph of the aviation programs offered by the institutions of higher education located in Oklahoma.

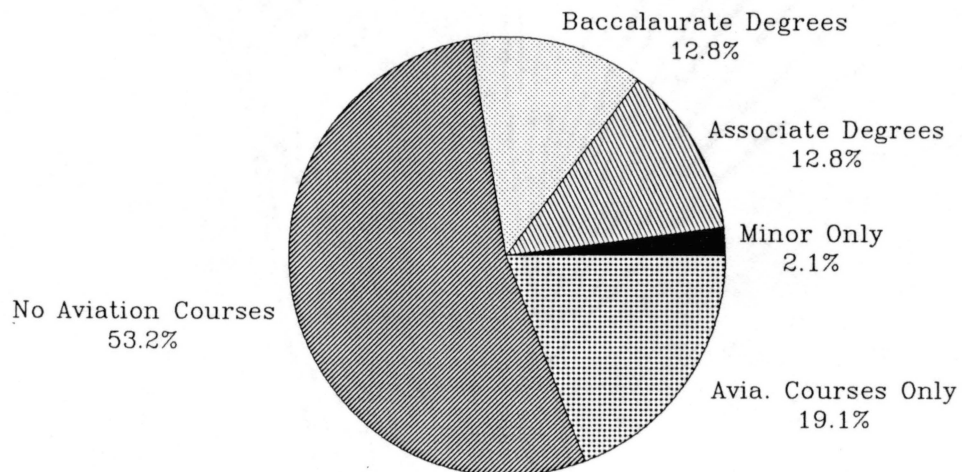


Figure 1. Percentage of Forty-seven Oklahoma Colleges and Universities Offering Aviation Education Programs or Courses

As the graph indicates, more than 46% of the colleges and universities in Oklahoma offered some aviation education. More than 25% of the institutions offered aviation programs that led to degrees.

## Oklahoma State Regents' Articulation Policy

The Oklahoma State Regents For Higher Education Policy Statement on the Articulation of Students Among the Institutions in the Oklahoma State System of Higher Education included Guidelines for the Transfer of Students Among Institutions. To take advantage of the articulation policy, students had to complete the Associate of Arts or the Associate of Science degrees meeting the Regents' standard that required thirty-seven hours of general education. This general education includes six hours of English composition; six hours of American history and U.S. government; six hours of science, six hours of humanities; six hours from two of the following areas: mathematics, psychology, social science, foreign languages, and fine arts; and additional liberal arts and science courses to meet the minimum total of thirty-seven hours. The remaining 23 hours had to apply to the student's major objective including prerequisite courses for the anticipated upper-division program. The majority of these 23 hours should be taken in courses classified as liberal arts and sciences. (Oklahoma State Regents, 1990, pp. II-2-17, 18)

The student who completed the Associate in Arts or Associate in Science degree may move vertically through the State System by transferring into a Bachelor of Arts or a Bachelor of Science degree program at any senior institution in the State System. The senior institution may require

additional general education. In fact, the Regents' policies required a minimum of forty hours of general education for the baccalaureate degree. However, the additional work must be a part of the upper-division requirements. (Oklahoma State Regents, 1990, pp. II-2-18)

Associate in Applied Science degree programs were not covered by this articulation policy. Instead, the Regents' policy permitted the receiving institution to determine the acceptance of course credits on the basis of applicability of the courses to the baccalaureate program in the major field to which the student was transferring.

The State Regents' policy stated that the title of Associate in Applied Science was awarded for completion of programs leading directly to employment in a specific career. This would apply to many of the aviation programs. The policy further stated that some bachelor's degree institutions had developed upper-division programs to recognize this degree for transfer purposes, and this was encouraged. The minimum standards for the Associate in Applied Science degree were contained in the State Regents' policy for the Standards of Education For Awarding The Associate Degree in Programs of Technical-Occupational Education. (Oklahoma State Regents, 1990, pp. II-2-85, 86).

The Technical-Occupational Education Associate in Applied Science degree required a minimum of 60 semester hours. This included 17 hours of general education, 29

hours of technical-occupational specialty courses, 8 hours of technical-occupational support courses, and 6 hours of technical-occupational related course work. The 17 hours of general education included three hours of communications; six hours of social studies consisting of American history and American government; and selected electives, approved or free, from science, mathematics, human relations, management, behavioral science, economics and communication. The eight hours of technical-occupational support courses were not a part of the specialty, but supported the specialty. For example, math-science courses would support electronics. Thus the eight hours of technical-occupational support could be general education courses. (Oklahoma State Regents, 1990, p. II-2-86)

Table V presents possible matching of two-year and four-year programs.

TABLE V  
POSSIBLE ARTICULATION OF TWO-YEAR  
AND FOUR-YEAR PROGRAMS

Two-Year College	Program	Four-Year University	Remarks
Northeastern Oklahoma A & M College	AAS Aviation	Southeastern OSU Southern Nazarene Univ. of OK (OU)	Short Gen. Ed. (GE) Short GE Short GE
Oklahoma City Community College	AAS Aviation Maintenance Technology	Southeastern Oklahoma State University	Short GE
Rogers State College	AAS Aircraft Maintenance Management  AS Aviation	Southeastern Oklahoma State University  Oklahoma State University Southeastern Oklahoma State University Southern Nazarene University Center at Tulsa Oklahoma University	Short GE

TABLE V (Continued)

Rose State College	AAS Aviation: Mid-Mgmt	Southeastern Oklahoma State University	Short GE
	AAS Aviation: Prof. Pilot	Oklahoma State University	Short GE
		Southeastern Oklahoma State University	Short GE
		Southern Nazarene University Center at Tulsa	Short GE Short GE
		Oklahoma University	Short GE
Spartan School of Aeronautics	AAS Aviation Maintenance	Southeastern Oklahoma State University	Short GE
Western Oklahoma State College	AAS Airport Management	Southeastern Oklahoma State University	Short GE
		Oklahoma State University	Short GE
		Southern Nazarene University Center at Tulsa	Short GE Short GE
		Oklahoma University	Short GE
		Southeastern Oklahoma State University	Short GE
	AAS Aviation	Oklahoma State University	Short GE
		University Center at Tulsa	Short GE
		Oklahoma University	Short GE
		Oklahoma University	Short GE

Table V indicates that graduates from most of the aviation education associate degree programs in Oklahoma were apt to find that additional lower-division general

education course work was required. The only exception was the Rogers State College Associate in Science degree program majoring in Aviation. The Aviation Education programs at Northeastern Oklahoma A & M College, Rogers State College, Rose State College, and Western Oklahoma State College would likely transfer for major credit at Oklahoma State University, Southeastern Oklahoma State University, Southern Nazarene University, University Center at Tulsa, and the University of Oklahoma. The Aviation Maintenance associate degree programs at Oklahoma City Community College, Rogers State College, Rose State College, Spartan School of Aeronautics, and Western Oklahoma State College would likely transfer for major credit to Southeastern Oklahoma State University.

### Recent Developments

Several recent developments in articulation of aviation programs have occurred in the Tulsa area where Oklahoma State University (OSU) provided an aviation program through the University Center at Tulsa. In December, 1990, the OSU Aviation and Space Education Department, and the Allied Helicopters International Incorporated of Tulsa reached an agreement to approve FAA Part 141 flight training for academic credit toward a Bachelor of Science Degree in Aviation Sciences. OSU also reached aviation articulation agreements with OSU at Okmulgee, Spartan School of



Aeronautics, and Tulsa Junior College. The agreement with Tulsa Junior College was based on an Associate in Science degree, so 37 hours of general education were covered by the State Regents' articulation policy. Additionally, advanced training credit may be applied for up to 25 hours of aviation sciences course work for students who graduated from FAA or Federal Communications Commission approved Aviation Maintenance Technology or Avionics Technology programs. The Tulsa Junior College catalog listed two avionics courses as an option under the Electrical Engineering Technology Associate in Applied Science degree. (Tulsa Junior College, 1990-91, pp. 125-126). These courses were never offered and were removed from the catalog when the articulation agreement was reached with Oklahoma State University.

### Survey Findings

The coordinator, director, or head of each of the aviation programs was contacted to confirm the information obtained from catalogs and schedules. A questionnaire (see Appendix B) was used in these interviews. Table VI presents the institutions with aviation programs leading to degrees as well as numbers of students and graduates in the fall semester of 1990.

TABLE VI  
STUDENTS, GRADUATES, AND CERTIFICATES  
AVIATION DEGREE GRANTING COLLEGES  
AND UNIVERSITIES IN OKLAHOMA

Institution	Aviation Degree	Enrolled Fall '90	Graduates Last Year	FAA Certificate
Northeastern Oklahoma A & M College	AAS	13	0	2
Oklahoma City Community College	AAS	89	0	N/A
Oklahoma State University	BS, MS	138	17	60
Phillips University	BS	2	0	N/A
Rogers State College	AS, AAS	30	12	N/A
Rose State College	AAS	200	12	30
Southeastern Oklahoma State College	BS	250	25	100
Southern Nazarene University	BS	24	2	6
Spartan School of Aeronautics	AAS	2450	400	1000
University Center at Tulsa	BS, MS	25	0	N/A
University of Oklahoma	BS	234	25	125
Western Oklahoma State College	AAS	125	6	40

Table VI shows that enrollment for the two-year aviation programs varied from 13 to 2,450 while enrollment for the four-year aviation programs varied from 2 to 250. The number of graduates from two-year aviation programs varied from 0 to 400 while graduates from four-year aviation programs varied from 0 to 25. FAA certificates varied from 2 at an institution with a new program to 1,000 for the Spartan School of Aeronautics. The number of FAA certificates issued was not applicable (N/A) for institutions whose programs did not lead to FAA certificates or that used contractors only for flight training.

Most of the institutions with aviation programs did not have articulation agreements covering their aviation programs with other institutions. Most reported requests to discuss articulation. Table VII presents the summary of responses to articulation questions during the interviews.

TABLE VII

ARTICULATION AMONG ALL AVIATION DEPARTMENTS  
IN OKLAHOMA COLLEGES AND UNIVERSITIES

Do you have articulation agreements for your aviation program?		Have students requested articulation information?		Have other institutions requested articulation agreements?	
yes	no	yes	no	yes	no
4	8	6	6	8	4

Table VII indicates that the majority (67%) of the institutions that offered aviation degree programs did not have articulation agreements with other institutions for these programs. However, the majority (67%) of the institutions had requests for articulation agreements.

The interviews did not identify a common barrier to articulation. Instead, the responses were varied and included the following perceived barriers: (a) guarding turf, (b) universities offering most of the aviation courses at the upper division level, (c) resource utilization, (d) core curriculum, (f) private schools giving college credit, (g) requiring Part 141 for transfer credit, (h) lack of regional accreditation, and (i) State Regents' policies. Five program heads felt that the Airway Science Program fostered articulation, but three reported that it did not.

Table VIII summarizes the responses of aviation program heads to questions asking if their enrollment was increasing, decreasing, or level; if they were satisfied with enrollment; and if they had coordinated marketing plans. All did not respond to every question.

TABLE VIII  
AVIATION MARKETING POTENTIAL

Enrollment			Satisfied with Enrollment		Exclusive Aviation Scholarships		Coordinated Marketing Plan	
Level	Inc	Dec	Yes	No	Yes	No	Yes	No
2	7	2	3	7	5	6	4	8

The majority (64%) of the aviation program heads reported that aviation program enrollment was increasing, but most (70%) were not satisfied with enrollment. Only 33% reported having coordinated marketing plans.

Critical issues facing aviation programs in higher education in Oklahoma often included financial concerns. Four aviation program heads reported funding as their most critical issue while one listed the cost of flight training. Another listed insurance costs as the most critical issue. Two program heads reported job placement for graduates as the most critical issue. Other reported critical issues were recruitment of students, coordinating with industry, and meeting the needs of employers.

The most outstanding feature reported for an aviation program often related to the quality of instruction. Others mentioned location, cost, students, and special features. Outstanding instruction included good simulators with FAA instructors, 50% theory and 50% hands-on experience, and

care and dedication. One director reported that hiring graduates of the program as instructors was the most outstanding feature. One reported outstanding students while another reported quality at the lowest cost. Dorms, college credit, and good instruction were also included. The proximity to Tulsa and American Airlines was a reported outstanding feature. Other features included a business-oriented aviation baccalaureate degree, and the aviation program as an extra feature for students majoring in other areas.

Demographics of the aviation faculty are presented in Table IX. It should be noted that the majority of these were employed by Spartan School of Aeronautics which had 130 full-time faculty and 20 part-time faculty members.

TABLE IX  
AVIATION EDUCATION FACULTY

Level	Full-Time	Part-Time	Women		Ethnic Minority
			Full-Time	Part-Time	
2-Year	132	43	6	2	5
4-Year	21	3	1	0	0
Total	153	46	7	2	5

Approximately 76% of the faculty were full-time, 95% were men, and only about 2% were of an ethnic minority.

Several authors pointed out problems that transfer students encountered in transitioning to four-year institutions after completing associate degrees, for example Zwerling (1976) and Bender (1978). The author found similar reports in discussions with graduates of two-year programs who transferred to four-year institutions. Some reported that they were treated as entering freshman for the first semester. They had little access to their departments. Often they were not advised and counseled by members of the departments in which they majored. Associate degree graduates reported that they were not respected and awarded privileges of other juniors at the university. They were excluded from such things as purchasing preseason football tickets and applying for scholarships. They were not afforded the opportunity to enroll at the same time as previously enrolled students who were members of the same class. Transferring students who had not earned associate degrees experienced even greater problems.

#### Summary of Findings

The aviation programs in Oklahoma do not foster articulation and transfer for students, nor were the programs designed for these purposes. There appear to have been few aviation student transfers either vertically or horizontally.

The two-year programs led to Associate in Applied Science degrees, with one exception. The programs were not designed as transfer programs. Instead these two-year programs concentrated on the technical-occupational specialty courses. Some had FAA approved Part 141 Pilot Schools, and the only Part 147 Aviation Maintenance Technician School in higher education in Oklahoma was at a two-year college, Spartan School of Aeronautics.

Two-year colleges were becoming more involved in aviation education. Examples included Northeastern Oklahoma A & M College which recently received FAA Part 141 approval, and Rogers State College which recently introduced two new aviation programs. Some of the two-year colleges offered more aviation courses than the universities. At the same time, some universities, long involved in aviation education, were offering less, especially in flight training. None of the four-year universities now have FAA approved Part 147 Aviation Maintenance Technician schools. This appears to be the ideal time for the two-year and four-year aviation programs to improve articulation.

The majority of two-year aviation degree programs required far less than the minimum 37 hours of general education that transferred readily for the Associate in Science or Associate in Arts graduate. Yet the two-year programs must be approved for an Associate in Applied Science degrees, with a minimum of 17 hours of general



education, according to the Oklahoma State Regents' policy. This appeared to be the greatest problem area for articulation and transfer from two-year to four-year aviation programs.

The State Regents' policy for Associate in Applied Science degrees required only 17 hours of general education. However, the required eight hours of Technical-Occupational Support Courses were normally considered general education courses. Some of the required six hours of related course work might be general education courses, and occasionally some technical-occupational specialty courses might be counted as general education courses, for example meteorology. Since the Associate in Applied Science degree graduate was not covered by the Oklahoma State Regents' articulation policy, the two- and four-year aviation program coordinators should work out specific articulation agreements.

## CHAPTER V

### SUMMARY AND CONCLUSIONS, AND RECOMMENDATIONS

#### Summary and Conclusions

The purpose of this study was to determine ways to improve the articulation and transfer of aviation students graduating from two-year colleges and continuing toward aviation baccalaureate degrees in Oklahoma universities. Current catalogs and schedules for all of the 47 Oklahoma colleges and universities were reviewed to determine which institutions offered aviation courses and programs. A content analysis was employed to determine if aviation courses or aviation programs were offered; to determine if there were aviation majors and minors offered; to determine if aviation degrees were offered; to determine aviation degree requirements; and to determine restrictions and limitations on articulation and transfer. Limitations and guidelines were determined from the Oklahoma State Regents for Higher Education policies. Each of the institution aviation education program heads or coordinators was contacted and surveyed using a questionnaire to confirm the accuracy of the information obtained from catalogs and schedules, and to provide new discovery, clarification, and

insight into articulation and transfer considerations that simply were not available in published materials.

The Oklahoma State Regents for Higher Education articulation policy did not cover the Associate in Applied Science degree. Yet five of the six two-year institutions offering aviation programs granted only Associate in Applied Science degrees in these programs. Therefore the graduates of the majority of the two-year aviation programs were not covered by the State Regents' articulation policy.

The Regents' articulation policy required that a minimum of thirty-seven of the sixty required semester hours for the transferring Associate in Science or Associate in Arts degree be in general education. The State Regents policy further restricted the remaining minimum twenty-three hours by requiring that the majority be taken in courses classified as liberal arts and sciences. Since aviation courses are not traditionally considered to be liberal arts and science courses, the State Regents' policy effectively limited the two-year college aviation program to less than twelve hours of course work.

A student who earned an Associate of Science or an Associate in Arts degree, for example in general studies, could transfer more of the lower-division course work to meet baccalaureate aviation program requirements than could one who completed an aviation program that led to an

Associate in Applied Science degree, none of which was covered by the State Regents' articulation policies.

The only Associate in Science degree program majoring in aviation had only eleven hours of aviation course work. The graduate of this Associate in Science degree would earn only a FAA private pilot certificate. There were no Associate in Arts degree programs majoring in aviation.

The State Regents' policy could force two-year college students, who seek to complete an aviation baccalaureate degree within four years after entering college, to take approximately thirty hours of aviation courses at the same time that the more rigorous upper division course work must be taken. The tuition and fee costs would be greater if more than half of the baccalaureate program were taken at the four-year institution. Additionally the cost of flight training might be substantially greater at the four-year institution. Spreading the flight training experience more evenly over the four-year period also has advantages to the students.

Several outstanding aviation programs had long operated under FAA Part 61 rather than Part 141. These programs often had high quality facilities, equipment, and instructors as well as outstanding graduates. Among the factors causing these institutions to operate under Part 61 were the time and resources needed to convert and operate under Part 141. Additionally applications, inspections, and

coordination with FAA would be required on a continuing basis. It appeared that the FAA officials would be most cooperative in approving these quality schools under Part 141. The students who transfer could find real advantages to having attended a Part 141 pilot school. Thus changing from Part 61 to Part 141 could be advantageous to colleges and universities involved as well as students. Associate degree graduates reported that they were not respected and awarded the privileges of other university juniors. During their first semester at universities, associate degree graduates were sometimes treated as entering freshman. They often had little access to the department in which they majored.

#### Recommendations

The following recommendations were made based on the findings and conclusions of the study.

(1) The Oklahoma State Regents should revise the articulation policy to allow graduates of two-year aviation programs to transfer the entire lower division general education credits earned in Associate in Applied Science degree programs toward general education requirements of aviation baccalaureate degree programs.

(2) The State Regents should approve two-year aviation programs as Associate in Science degree programs as well as Associate in Applied Science degree programs. The State

Regents policy would also have to delete the requirement that the majority of the course work in addition to the required 37 hours of general education should be in courses classified as liberal arts and sciences. These policy changes could place the two-year associate degree programs within the state articulation agreement.

(3) Universities with aviation baccalaureate degree programs should change more courses to lower division level. This should enhance articulation and transfer possibilities between two-year and four-year aviation programs, and would likely reduce student costs.

(4) Institutions should seek FAA Part 141 approval for aviation programs not approved under Part 141, but which have met or exceed most of the requirements.

(5) Aviation program heads and coordinators should meet annually to discuss articulation and transfer among Oklahoma colleges and universities.

(6) A new professional organization of Oklahoma aviation educators should be formed.

(7) Aviation program heads and coordinators should make an active effort to standardize course titles and numbers.

(8) Universities should assign graduates of two-year aviation programs who are transferring to baccalaureate aviation programs directly to the aviation department of universities. Additionally, transferring graduates should

be assigned immediately to faculty advisors who are members of the aviation departments.

(9) Additional studies should be conducted regarding funding for aviation programs in both private and public institutions; better defining standards for aviation management programs; placement and determining what graduates actually do; the need for the development of transition courses from college to employment in airlines; the job market for graduates of aviation programs; aviation education equipment; classroom materials and textbooks; human factors; reasons for isolation of programs; and assessment of aviation programs.

Both two-year and four-year higher education institutions in Oklahoma offer high quality high level aviation education programs. In many cases the two-year aviation program may cost the students less. Several two-year colleges are located where the airspace is less congested than in the metropolitan areas. Higher education institutions face tight budgets. Now seems to be the time to make optimum use of two-year and four-year institutions in both public and private educational settings. Relatively small changes in the State Regents' policies could improve articulation and transfer among the Oklahoma colleges and universities. Aviation program heads could implement changes to improve articulation. These changes could result in improvements to articulation that will result in

substantial advantages to aviation students, higher education institutions, and the State of Oklahoma. Now is the time to improve articulation among colleges and universities in Oklahoma.



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## APPENDIXES

## APPENDIX A

### COLLEGES AND UNIVERSITIES OF OKLAHOMA

1. Bacone College
2. Bartlesville Wesleyan College
3. Cameron University
4. Carl Albert Junior College
5. Central State University
6. College of Osteopathic Medicine of Oklahoma State University
7. Connors State College
8. East Central University
9. Eastern Oklahoma State College
10. El Reno Junior College
11. Flaming Rainbow University
12. Hillsdale Free Will Baptist College
13. Langston University
14. Mid-America Bible College
15. Murray State College
16. Northeastern Oklahoma A & M College
17. Northeastern State University
18. Northern Oklahoma College
19. Northwestern Oklahoma State University
20. Oklahoma Baptist University
21. Oklahoma Christian University
22. Oklahoma City Community College
23. Oklahoma City University
24. Oklahoma Junior College of Business and Technology
25. Oklahoma Missionary Baptist College
26. Oklahoma State University
27. Oklahoma State University-Oklahoma City
28. Oklahoma State University-Okmulgee
29. Oral Roberts University
30. Panhandle State University
31. Phillips University
32. Rogers State College
33. Rose State College
34. Seminole Junior College
35. Southeastern Oklahoma State University
36. Southern Nazarene University
37. Southwest College of Christian Ministries
38. Southwestern Oklahoma State University
39. Southwestern Oklahoma State University at Sayre

40. Spartan School of Aeronautics
41. St. Gregory's College
42. Tulsa Junior College
43. University Center at Tulsa
44. University of Oklahoma
45. University of Science & Arts of Oklahoma
46. The University of Tulsa
47. Western Oklahoma State College

APPENDIX B

AVIATION PROGRAM

Survey/Interview Questionnaire

Name of Institution: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_

Name of Aviation Program(s) Coordinator: \_\_\_\_\_

1. What is the highest aviation degree offered at your institution? AS AAS BS MBA MS Ed.D Ph.D

A. What is the title of degree?

2. Which aviation majors does your institution offer?

3. Do you have a minor in aviation? yes no

4. How many students are enrolled in the aviation program(s) at your institution?

Fall 1990 \_\_\_\_\_ Spring 1991 \_\_\_\_\_

Number of Graduates during past year \_\_\_\_\_

Number of Certificates and ratings \_\_\_\_\_

5. Do you have articulation agreements with other institutions for your aviation programs? yes no

If yes, explain.



6. Have you had requests for transfer/articulation information from your students?    yes    no
- A. How many?
- B. How were you able to satisfy the requests?
7. Have you had requests for articulation discussions and agreements from other institutions?    yes    no
- If so, what is the status?
8. With what aviation organizations is your institution associated?
- Professional
- Trade
9. Are there barriers to articulation? (i.e. State government, Regents)
10. Do you have a coordinated marketing plan?    yes    no
- A. Are you satisfied with current enrollment?
- B. Is it increasing or decreasing?
11. Do you have scholarship programs exclusively for aviation students?
12. Do you agree with the summation of your catalog and fall 1990 semester schedule?    yes    no
- If not, please make corrections as necessary.
13. Are your aviation education facilities adequate?  
yes    no
- If not, why?
14. Is your aviation education equipment adequate?    yes    no
- If not, why?
15. Do you have simulators?
- Number & Type
16. Describe your aircraft and arrangements for flight training, if applicable.

17. Demographics on faculty.
  - A. How many full time?
  - B. How many part time?
  - C. How many women?  
Full time?
  - D. How many faculty members are of a minority ethnic group?
18. What is the most outstanding feature of your aviation program? (Point of view of program coordinator)
  - A. Point of view of student or administration, if available.
19. What are the most critical issues facing aviation programs in higher education in Oklahoma?
20. Does the Airway Science Program foster articulation from 2-year to 4-year institutions?    yes    no
21. Do you have ideas for further research?
22. Do you have any final comments or recommendations concerning articulation of aviation programs?
23. Please provide copies of the following:
  - A. Articulation agreements.
  - B. Brochures covering your aviation program.

## APPENDIX C

### COLLEGES & UNIVERSITIES IN OKLAHOMA

#### OFFERING ANY AVIATION COURSE

1. Carl Albert Junior College
2. El Reno Junior College
3. Eastern Oklahoma State College
4. Northeastern Oklahoma A & M College
5. Northeastern State University
6. Northern Oklahoma College
7. Northwestern Oklahoma State University
8. Oklahoma Christian University
9. Oklahoma City Community College
10. Oklahoma State University
11. Panhandle State University
12. Phillips University
13. Rogers State College
14. Rose State College
15. Southeastern Oklahoma State University
16. Southern Nazarene University
17. Southwestern Oklahoma State University
18. Southwestern Oklahoma State University at Sayre
19. Spartan School of Aeronautics
20. University Center at Tulsa
21. University of Oklahoma
22. Western Oklahoma State College

## APPENDIX D

### INSTITUTIONS IN OKLAHOMA OFFERING ASSOCIATE DEGREES IN AVIATION

1. Northeastern Oklahoma A & M College
2. Oklahoma City Community College
3. Rogers State College
4. Rose State College
5. Spartan School of Aeronautics
6. Western Oklahoma State College

## APPENDIX E

### INSTITUTIONS IN OKLAHOMA OFFERING BACCALAUREATE DEGREES IN AVIATION

1. Oklahoma State University
2. Phillips University
3. Southeastern Oklahoma State University
4. Southern Nazarene University
5. University Center at Tulsa
6. University of Oklahoma

2

## VITA

Henry Fillmore Hartsell

Candidate for the Degree of

Doctor of Education

Thesis: ARTICULATION OF AVIATION EDUCATION PROGRAMS AMONG  
OKLAHOMA COLLEGES AND UNIVERSITIES

Major Field: Higher Education

Area of Specialization: Aviation Education

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Professional Experience: Director, Technical Education  
at Western Oklahoma State College since July 1980,  
Head of Aviation Programs since 1976, and  
Instructor since 1974; past Owner and Operator of  
several Aviation Fixed Base Operations; USAF Pilot  
and Air Staff Officer 1952-1973.

Professional Organizations: University Aviation  
Association, American Association of Airport  
Executives, Alpha Eta Rho, Altus Rotary Club,  
Daedalians, American Technical Education  
Association, Air Force Association, and Oklahoma  
Technical Society.

FAA Ratings: Airline Transport Pilot; Gold Seal  
Flight Instructor Single, Multiengine, and  
Instrument; Ground Instructor Advanced and  
Instrument; FAA Designated Pilot Examiners,  
and Written Test Examiner.