

KANSAS AVIATION EDUCATION: A COMPARISON
AGAINST NATIONAL NORMS

By

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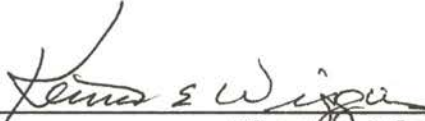
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CHAPTER I

INTRODUCTION

Background of the Study

Few can deny how important aviation has become in the modern world in the last seventy five years. Shortly after the Wright Brothers' first flight in December of 1903, great minds of the past began to investigate the benefits of flight. The air transportation system of today is a substantial, intricate machine with enormous needs for highly educated members. Aviation higher education has been supplying this void since a scant few years after the Wright Brothers' first flight.

Aviation education at the post-secondary level is very different from one institution to another. The factors that make up a good aviation education program are difficult to ascertain. How do aviation programs rank against peer institutions, or against a nationwide norm? What is considered to be the norm in aviation education? Higher education history can be traced back hundreds of years, while aviation higher education has been in existence for less than ninety years.

Kansas has been considered for many years a center for

aviation activities. Specifically, Wichita has been the self-proclaimed "Air Capital of the World" for many years. One might expect Kansas aviation to be above the nationwide norm and inferior to few. In reality only one four-year, non-engineering aviation degree program exists in Kansas. This study compares the aviation program in Kansas against a nationwide norm. This norm was established by survey results from a nationwide study of four-year and higher aviation education programs.

We stand on the threshold of the twenty-first century. As we cross that threshold, aviation is an integral part of everyday life. Higher education should and will play an increasing role in producing highly educated personnel for the aviation industry. As future aircraft become more and more complex, it will become very evident that the aviation industry must be educated to a higher plateau than in the past. Higher education must respond to the task by improving the quality and scope of aviation programs. A study of this type could point out both strengths and weaknesses in today's varied aviation programs.

Nature of the Problem

Kansas aviation education programs may indeed vary widely in quality across the state. However, only the single four-year program is within the parameters of this study.

To enable a comparison to be made with other institutions that offer aviation education, a nation-wide study was conducted throughout the United States to establish those qualities that are considered to be excellent. This study was a nationwide survey of aviation education quality factors as perceived by aviation department chairs or the equivalent.

The University Aviation Association (UAA) is an organization composed of colleges, universities, and interested individuals in aviation education. A study and survey of this organization's membership provides an excellent base for comparison of perceived educational quality. A survey conducted with members of the UAA afforded a stable platform to establish both ratings and a norm for such comparison. The Kansas aviation education program, after undergoing the same survey as the other nationwide membership of the UAA, was then compared and contrasted with other institutions. This study also produced such demographic information such as: number of students enrolled in aviation education programs, size of parent institution, highest aviation degree offered, types and number of aviation scholarships offered, faculty demographics, and physical resources such as training aircraft and simulators.

Statement of the Problem

Is the Kansas aviation education program at the higher education level on a par with other similar aviation education programs? Further, how does the Kansas aviation education program compare in perceived quality and demographic data. If indeed the Kansas aviation education program was superior to other programs, in which factors did it excel? Finally, is there a nationwide norm in quality of aviation education that the Kansas program can be compared with? This study surveyed aviation education programs on a nationwide basis in order to establish quality relationships of aviation education programs.

The problem examined in this study may be stated as follows: How does the Kansas aviation education program, at the higher education level, compare to similar programs nationwide? Comparisons were made with the following factors: size of program, age of program, faculty size and experience, scope of programs offered, student accessibility, and the perceived quality of the overall program by the program coordinator. This study indicated that changes and/or improvements in the four year aviation education program in Kansas are possible and desired. If these changes are implemented, such actions would bring about enhancement in the quality of the aviation program in Kansas. This study also indicated the need for additional four year aviation degree programs in Kansas. The results

of this study were analyzed to answer these questions.

At present there is only one four-year degree program in aviation in Kansas. This degree program is a Bachelor's in Business Administration with a major in Aviation Management offered at The Wichita State University, located in Wichita Kansas. Many Kansas colleges and universities offer courses and workshops in Aviation, but only Wichita State offers a four-year degree. Kansas State University at Salina, Kansas offers many aviation courses, however at present Salina only offers an Associate Degree. At this time the Airway Science curriculum is not offered in Kansas. There are Aeronautical Engineering programs available in four-year and higher degrees in Kansas, but only non engineering aviation education programs were of interest to this study.

Purpose of the Study

The purpose of this study was to provide information necessary for the enhancement of Kansas Higher Education Aviation programs, determine if there is a need for additional programs in Aviation in Kansas, and to provide a national quality norm for comparison. This study collected and analyzed information for comparison of the Kansas higher education aviation program against other aviation programs throughout the United States. Information was obtained directly from program directors or equivalent at each member

institution in the University Aviation Association (UAA). Both demographic and subjective quality data was collected. These program coordinators offered an internal perspective of their own programs. It was assumed that they were qualified to offer a perspective on peer institutions. These individuals also projected immediate future needs and changes.

Information collected and results of this study should be of interest to member institutions of the University Aviation Association and the aviation community at large. Such information may also be of value to the aspiring aviation student in choosing the institution she/he wishes to attend. Finally this study should establish aviation education quality characteristics. This effort could develop into a national norm of quality assessment, and provide a basis for comparison of aviation education programs through out the United States. The following is a list of U.A.A. member institutions that offer a four-year non-engineering aviation education degree:

Four-Year Program Institutions

Andrews University, Berrien Springs, MI
 Arizona State University, Tempe, AZ
 Auburn University, Auburn, AL
 Averett College, Danville, VA
 Baylor University, Waco TX
 Bowling Green State University, Bowling Green, OH
 Bridgewater State College, Bridgewater, MA
 Central Missouri St. University, Warrenburg, MO
 Central Washington University, Ellensburg, WA
 Chadron State College, Chadron, NE

College of Aeronautics, Flushing, NY
Concordia University, Wisconsin
Daniel Webster College, Nashua, NH
Delaware State College, Dover, DE
Delta State University, Cleveland, MS
Dowling College, Oakdale, NY
Eastern Kentucky University, Richmond KY
Elizabeth City State University, Elizabeth City, NC
Embry-Riddle Aeronautical University, Daytona Beach, FL
Fairmont State College, Fairmont, WV
Florida Institute of Technology, Melbourne, FL
Florida Memorial College, Miami, FL
Geneva College, Beaver Falls, PA
Georgia State University, Atlanta, GA
Golden Gate University, San Francisco, CA
Hampton University, Hampton, VA
Henderson State University, Arkadelphia, AR
Indiana State University, Terre Haute, IN
Jackson State University, Jackson, MS
Kent State University, Kent, OH
Lewis University, Romeoville, IL
Louisiana Technical University, Ruston, LA
Lynn University, Boca Raton, FL
Metropolitan State College of Denver, Denver, CO
Middle Tennessee State University, Murfreesboro, TN
National University, San Diego, CA
Nicholls State University, Thibodeaux, LA
Norfolk State University, Norfolk, VA
Northeast Louisiana University, Monroe, LA
Ohio University, Athens, OH
Oklahoma State University, Stillwater, OK
The Ohio State University, Columbus, OH
University Of Alaska, Anchorage AL
University Of Dubuque, Dubuque, IA
University Of Illinois, Savoy, IL
University Of Maryland Eastern Shore, Princess Anne, MD
University Of Nebraska at Omaha, Omaha, NE
University Of Nebraska-Kearney, Kearney, NE
University Of North Dakota, Grand Forks, ND
University Of The District of Columbia, Washington, DC
University of Oklahoma, Norman, OK
Parks College of St. Louis, Cahokia, IL
Purdue University, West Lafayette, IN
Rocky Mountain College, Billings, MT
San Jose State University, San Jose, CA
Southeastern Oklahoma State University, Durrant, OK
Southern Illinois University, Carbondale, IL
St. Cloud State University, St. Cloud, MN
St. Francis College, Brooklyn Heights, NY
Tennessee State University, Nashville, TN
Texas Southern University, Houston, TX
Utah State University, Logan, UT

Wentworth Institute of Technology, Boston, MA
West Liberty State College, West Liberty, WV
Western Michigan University, Kalamazoo, MI
Wichita State University, Wichita, KS
Wilmington College, New Castle, DE
Winona State University, Winona, NM

This study gained insight from the program coordinators at the various member institutions in order to make suggestions for future improvements in aviation education.

Research objectives were:

- (1) to identify a national norm for comparison of aviation education programs in varying aspects of quality,
- (2) to establish the views, opinions, needs, and suggestions of member program coordinators toward improvement of aviation education,
- (3) to survey the present state of aviation education, and
- (4) to identify alternatives for improvement of Kansas Aviation programs.

Limitations of the Study

This study will be limited to information gathered from program coordinators, chairs, directors, or curriculum coordinators at various University Aviation Association member institutions. Such information may be subject to error and bias of the subject of the interview. Limited time in the telephone interview process may restrain the

quality and quantity of the responses of the survey group. Survey responses will be based on subjects' perceptions of various aviation-related questions. This survey was limited to telephone interviews due to the number and distances of the institutions involved. It should be noted that the telephone does not convey visual information that is sometimes as important as the answers to the questions. This study only included responses from program coordinators or faculty members. Secretaries and students were not allowed to take part in the interview process. A second survey instrument (see Appendix B) was constructed with key elements determined in the telephone interviews. This instrument was then mailed to aviation department chairpersons. Results were compared to earlier responses obtained with the telephone interviews.

Assumptions

The following assumptions were considered:

- (1) the assumption that program coordinators were candid in their responses,
- (2) the assumption that the questionnaires encompassed the necessary topics,
- (3) the assumption that the questionnaires were easily understood to achieve necessary responses,
- (4) the assumption that data was obtained from persons that are routinely very busy hence producing brief

answers,

- (5) the assumption that program coordinators accurately represent the character of aviation education,
- (6) the assumption that the written instrument was comprehensive and an appropriate follow up tool.

Definitions

The following terms and abbreviations will be used in this study. Definitions are therefore provided:

FAA. Federal Aviation Administration

UAA. University Aviation Association

CAA. Council on Aviation Accreditation

AOC. Areas of concentrations

Aviation Education. In this study post-secondary non-engineering aviation programs.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

Aviation Education, compared to most other academic disciplines, is a new field. One of the earliest examples of Aviation Education in schools of the United States was in 1908 in the physics classes of H. LaV. Twining of the Los Angeles Polytechnical High School. The course titled, "Aviation Craftsmanship and Learning to Fly" was offered only a scant five years after the Wright brothers first flew. In 1910, on the site of what is now the Air University in Montgomery, Alabama, a private flight school was established. In 1911, the Army activated its first flight school in College Park, Maryland (Thomason, 1968). Aviation education in higher education would now begin to flourish.

Background Literature

A most significant boost to early Aviation Education came in 1926 with the establishment of the Daniel Guggenheim Fund. This gift of two and one half million dollars promoted many advances in aviation. "Harry Guggenheim,

President of the Fund, described its purposes as fourfold:

"To promote aeronautical education, both academic and general.

To assist in the extension of fundamental aeronautical science.

To assist in the development of commercial aircraft.

To further the application of aircraft in business, industry, and other economic and social activities of the nation."

This fund was directly responsible for the development of text books on aviation and other supplementary materials.

The fund also allowed for Dr. Roland H. Spaulding of the New York University to prepare what may have been the first aviation education bibliography titled "Books on Aeronautics: A bibliography of Books Likely to be of Use in Elementary and Secondary Schools." Dr. Spaulding went on to become a pioneer in the field of aviation education at the higher education level (Strickler, 1968).

The first public school system to incorporate aviation education into its curriculum was more than likely Galt, California. Other early school systems around the middle twenties were entering into aviation education, but the Galt schools were of special interest to this study in that the four-year high school program was extended to two years of junior college. The Galt schools were the first public schools to offer flight instruction. In the early twenties,

Finis E. Engleman taught an aviation course for teachers at the Kansas City Teachers College. Engleman, a pilot himself, later became nationally known as a member of the American School Administrators. The largest program for aviation education for teachers was New York University's program supported by the aforementioned Guggenheim fund. This course, offered in 1928, was a survey type offered to teachers to provide a wide range of aviation topics and subjects. The class was organized in such a way as to provide varied information on aviation topics, similar to many of the modern aviation classes or workshops offered at the college level today. This course was organized in such a way as to have value to both primary and secondary level educators. This was most likely the first survey type aviation education class (Strickler, 1968).

In 1926, John Paul Riddle and T. Higbee Embry formed Embry-Riddle Aeronautical University in Cincinnati, Ohio. Today, it has grown into the oldest and largest totally aviation-oriented university in the world. (Embry-Riddle) Amelia Earheart was outfitted for her famous flight, of 1928, at another early aviation college known as Parks College in Saint Louis, Missouri. In 1929, Wichita University organized its' Aeronautical Engineering Department. However, the University would not offer Aviation Education classes until well after World War II. (Bowen, 1991)

L. W. Brooks was another early pioneer in the field of aviation. In 1929, while president of the Kansas State Teachers Association, Brooks chartered an open cockpit biplane and became the first person to attend meetings in all six cities where annual education conventions were being held. Mr. Brooks then organized the Kansas Commission on Aerospace Education, of which the author of this work is a member. The commission, now celebrating forty-six years of private funding, has been instrumental in Kansas for setting up and assisting in workshops for teachers and supporting aviation by making the public aware at every opportunity (Throckmorton, 1964). Early programs in Kansas included Philip Billard of Topeka who established an aviation school for the Aero Corps of the Kansas National Guard in 1916. In 1917, The University of Kansas offered a five-credit-hour course on Fundamentals of Aviation.

Aviation became more and more popular with the general public as the decade of the 1930's opened. Historic firsts such as Lindberg's Atlantic crossing and others kept aviation in the headlines of the period. The First National Conference on Aeronautical Education was held in St. Louis in 1930. As early as 1932, the United States Office of Education published handbooks related to aviation. The first handbook was related to industrial education for aviation mechanics, but by 1936 the United States Office of Education published "Aviation in the Public Schools." Also,

in 1936, the Bureau of Air Commerce in cooperation with the National Education Association published an article on aviation education in the Journal of The National Education Association. The Civil Aeronautics Act of 1938 established the Civil Aeronautics Authority, which would become the Civil Aeronautics Administration in 1940. From its inception, the institution would greatly affect aviation by publishing materials on many aviation topics. We now know this government agency by the new name it received in 1958-NASA. (Strickler, 1968)

Congress passed the Civil Pilot Training Act in June, 1939. This act initiated a new series of programs at the secondary level called PreFlight Aeronautics. The major goal of this program was to give young men a head start in training as military aviators. This program, which was administered by the Civil Aeronautics Authority, started in 1939 with 13 colleges and had an enrollment of 331 students. With conditions in Europe rapidly deteriorating, there was a great push to expand. When the program became fully operational, 884 colleges, 268 private schools, 195 high schools, 120 civic organizations, and 1,250 independent flight instructors were providing training. When war was declared on Germany almost 100,000 people had received pilot training. The civil pilot training program's main responsibility was to train pilots specifically to obtain the private pilot license. To this end, 70,000 students had

obtained their private pilot license by the end of 1942. The civil pilot training program also influenced many other areas such as airport design, instructor training, aircraft insurance, avionics, and of most importance to this study, educational curriculums. (Strickler, 1968)

Prior to 1942 aviation education was basically flight instruction. The booklet "Air Conditioning Young America" was prepared by the Civil Aeronautics Administration and the U.S. Office of Education. It viewed aviation education as having two facets. One facet was actual flight training, while the other was the study of the effect of aviation on everyday life. This would encompass the study of aviation and all of its peripheral effects. Also published in 1942, the Air-Age Education Series was sponsored by the Institute of the Aeronautical Sciences and the Civil Aeronautics Administration. The series consisted of twenty books covering aviation education, aviation medicine, meteorology, and aviation relationships among traditional subjects such as math, social studies, science, and industrial arts. Two basic types of courses were envisioned. One course covered the technical characteristics of aircraft. This included both pilot training and repair type courses. The other type of course was broad and general in its scope. It could be a prerequisite for further study for student to comprehend the entire scope of aviation. This program was designed to promote and encourage the use of aeronautics in high school

curricula.

Strickler, in his book, "An Introduction to Aerospace Education", stated, "This program started in 1942 and was divided into two major activities; the provision of training material and the training of qualified instructors. Training material development included textbooks, suggested syllabi, and bibliographies. During the period of intensive development and promotion, 1942-1944, it is estimated that half of the nation's high schools offered an aviation course" (Strickler, 1968). H. E. Mehrens (1954), in his book, Aviation in School and Community, identified eleven aspects of aviation to be included in a survey class. This book, although published in 1954, gave an overview of early general classes in aviation (Strickler, 1968). The Civil Pilot Training program became part of the Wartime Training Service in December, 1942. This program included a flight indoctrination phase which provided ten hours of dual instruction for non-pilot flight crew members. By the end of 1944, both the Civil Pilot Training program and the Wartime Training Service had provided instruction for over 500,000 aviation trainees. Total cost of this training amounted to over a quarter of a billion dollars. This was most certainly an astronomical amount in the 1940's. (Strickler, 1968)

Following World War II, Public Law 346 was put into effect. This law, known as the G.I. Bill, allowed the

number of college courses in aviation to greatly increase. The effect of World War II on Aviation Education was enormous. The Congressional Aviation Policy Board of 1948 had this to say about aviation: "Until men of all nations can meet in good will in the council chambers of the world, anything less than this complete supremacy in airpower is self-deception" (Mehrens, 1954). It is certain then, as now, that air supremacy can only be accomplished if pilots and support crews are produced by aviation education.

Literature Identifying the Problem

Dr. Leslie L. Thomason, one of aviation education's most prolific authors stated:

"Aviation programs in our post secondary schools are not new. A Master of Science in Aviation was conferred by an eastern university as early as 1908. Other than aeronautical engineering curricula, however, degree programs remained quite limited in number and in scope until about the close of World War Two when they began to increase to meet the needs of an expanding aviation industry. The new aviation education programs, as distinguished from aeronautical engineering, are receiving widespread acceptance and increased recognition for academic credence and functional credibility. Such programs fill a void between aeronautical engineering and the craft oriented activities of conventional trade schools. Most of the programs are characterized under the terms of aviation, aviation education, aviation sciences, or aeronautical technology." (Matson, 1990)

The structure of these programs and the organization of aviation departments vary greatly from one institution to another. There may be many reasons for this, but primarily it is usually the problem of finding an academic "home".

Dr. Hubert C. Smith wrote:

"One of the basic problems of an aviation program, especially at a large university, is finding an academic home. The reason is two-fold. First aviation is not a traditional subject of higher education and is often shunned, being regarded by many administrators as trade-oriented. Secondly, the areas of specialization within aviation vary widely and cross the boundaries of major university organizational structure."
(Matson, 1990)

An aviation department must then address itself to a very wide teaching area. The aviation department at one university might be called on to provide teacher inservice and certification, provide airline management and fixed base operator management classes, teach flight training from private to commercial, and even provide some type of technical maintenance technology classes. Here education, business, and vocational technology departments are all incorporated into one department. One can easily see the problems incurred in such a mega department. Obviously, the faculty involved in such a department would require a varied background. Smith in "Aviation - Academic Orphan Looking for a Home" wrote from the perspective of incorporating Aviation/Aerospace Education into Aeronautical Engineering departments. This system may work, but it is somewhat like a college physics department teaching mathematics. Granted, the subjects are related, but separate departments may function with superior results.

Related Research

Airway Science is a relatively new program being adopted by many universities throughout the United States. Bowen, quoting from The Federal Aviation Administration's Airway Science program as Perceived by Program Coordinators in Participating Colleges and Universities (Bowen, 1989), described the literature related to the Airway Science Program. This program was developed shortly after then President Reagan fired 12,000 FAA air traffic controllers in 1981. Bowen stated,

"The objectives of this program were to provide for: (1) the recruitment/hiring of individuals who have completed or have the equivalent of a model college-level curriculum of general studies, mathematics, science and technology, management, and aviation courses; (2) the evaluation of the concept that individuals with this background recruited to FAA occupations are better able to perform the functions of the job than individuals recruited through existing methods; (3) the assessment of the performance, job attitudes, and potential of airway science individuals versus those of individuals employed by current procedures; (4) the determination of the impact of this program on the employment in career professions of women and minority candidates."

The FAA Airway Science Program was officially Titled "Airway Science Curriculum Demonstration Project" and its state purpose was:

"to compare the performance, job attitudes, and perceived potential for supervisory positions of individuals recruited for several of FAA's technical occupations who have an aviation-related college-level education, or its equivalent, with individuals recruited for the same occupations through traditional methods." (Bowen, 1989)

The FAA chose the University Aviation Association to coordinate the Airway Science Program with its member institutions. The UAA then became responsible for assuring that the FAA guidelines for the Airway Science Program would be carried out. (Bowen, 1989).

Curriculum

Airway Science is a four-year baccalaureate degree with five major options, Airway Science Management, Airway Computer Science, Aircraft Systems Management, Airway Electronic Systems, and Aviation Maintenance Management. Airway Science provides essential technical education to the aviation and aerospace industry. Universities and colleges can offer one or any combination of these options. Bowen found the major criticism of Airway Science involved the FAA's practice of hiring individuals without a four-year degree instead of Airway Science Graduates. (Bowen, 1990.)

Johns D. Odegard in Airway Science; Aviation Education for the Future found that as little as only 15% of air traffic controllers had a four-year college education. FAA administrators foresaw the need for a more broadly educated work force:

"Education was also seen to be quite different from training. Training is simply learning how to do something-how to become prepared for a particular test of skill-and it leaves little room for initiative or spontaneity by the student. Pilot training, for example, prepares people to respond to predictable situations by providing

them with responses that are considered the most appropriate. Education, on the other hand, prepares people to deal with problems that are complex and unpredictable, or for which no best answer exists." (Matson, 1990)

Odegard further stated:

"With this distinction between training and education in mind, several leading schools with aviation programs suggested curriculums which were used to formulate a composite generic curriculum. This composite was then used by the UAA Airway Science Committee to develop the final generic curriculum. The Committee decided that the ideal Airway Science program would have one degree (B.S. in Airway Science) with five options: Airway Science Management, Airway Computer Science, Aircraft Systems Management, Airway Electronics Managements, and Airway Maintenance Management... The Committee and the FAA recognized that the generic Airway Science Curriculum would not be followed in a completely uniform way, as course titles and credit hours vary from institution to institution. However, the principal objective of the Committee in reviewing the submitted programs will be to assure the academic integrity of the Airway science curriculum by determining that the spirit and intent of the generic curriculum is upheld." (Matson, 1990)

Finally aviation education had a curricular framework that would provide a common basis throughout American colleges and universities. The five options above are now referred to as Areas of Concentrations (AOCs). The FAA publication Careers in Airway Science describes the Airway Science Curriculum;

"The Airway Science curriculum has a nucleus of courses called the Core Subject Area that provides you (the student) with a comprehensive educational program emphasizing critical thinking, cognitive and analytical skills, communication skills, plus

mathematics, science and technology, computers, management, and aviation." (FAA, 1994)

The following table details the Core Subject Area as described in Careers in Airway Science:

TABLE I
AIRWAY SCIENCE CORE SUBJECT AREAS

| Core Subject Area | Semester Hours |
|-------------------------|----------------|
| General Studies | 24-30 |
| Math/Science/Technology | 21-28 |
| Computer Science | 9 |
| Management | 9-12 |
| Aviation | 15 |
| General Electives | 30* |

*Or a total sufficient to meet institutional graduation requirements and meet the minimum of 80 hours for the total Core Subject Areas Requirements.

Airway Science requires a minimum of 80 semester hours in the Core Subject Areas. It is interesting to note that only 15 semester hours of these 80 semester hours are aviation courses. The remaining 65 semester hours should be of value in many fields outside of aviation. The remainder of hours beyond the 80 semester hours are devoted to a general electives. General electives are required to be a minimum of 30 semester hours or a number sufficient to meet

institutional graduation requirements. The content of these courses will vary from one institution to another and also with the student's choice of subjects. This degree program has a high degree of flexibility with 24-30 semester hours in general studies (General Education studies) and 30 or more semester hours invested in general electives. These hours represent approximately half of the total of most baccalaureate degree requirement. Jerry G. Gaff writes in his article Emerging Curricular Patterns; "The actual amount of required general education varies among schools. The mean amount of general education required in four-year institutions is 44 semester hours...Most schools require that between one-fourth and one-half of a student's four-year program be devoted to general education courses."

(Conrad and Hayworth, 1990) The Airway Science Curriculum addresses the need for a portion of the curriculum to be comprised of general education courses, and the nature of these courses is determined by each individual institution.

A. M. Cohen and F. B. Brawer in Career Education: Occupational Entry, Change, and Development describe this implication about career education such as airway science;

"To what degree should the schools be in the business of providing trained workers for the nation's industries? None, say the academic purists; totally, say many community college leaders. A lengthy list of commentators and education philosophers would argue that the preparation of people specifically to work in certain industries is not the school's purpose because the industries can do the particular job

training much more efficiently. And those who take this approach are not necessarily those who plead for a return to an era when higher education was for providing gentlemen with distinctive sets of manners. (Conrad and Hayworth, 1990)

The Airway Science Curriculum provides a compromise position between the need for specific job training and a general education that the student would probably not receive with a two year Associates degree.

Henry Hartsell in Articulation of Aviation Education Programs among Oklahoma Colleges and Universities stated; "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." (Hartsell, 1991). The flexibility of the Airway Science Curriculum should encourage articulation, and provide the needed emphasis of a general education.

CHAPTER III

METHODOLOGY

Preliminary Procedures

Data were collected to ascertain the perceived quality of four-year and higher aviation education programs throughout the nation. This information was obtained from program coordinators, department heads, or similar individuals at the various institutions throughout the United States (N=68). This nationwide information was then examined along with the information obtained from the Kansas institution and a comparison was made. A copy of the telephone interview questionnaire is found in Appendix A. Objective and subjective data were obtained from program directors in this study. Demographics as well as opinions were acquired. Key factors concerning aviation education were then organized into a second instrument. Aviation department heads were mailed the instrument and asked to rank in importance the various key factors. This instrument is found in Appendix B.

The University Aviation Association membership list was used to identify four-year and higher aviation education programs offered in the United States. Aviation programs

less than four years were not considered in this study. The UAA April 1992 Membership List contained the names of 106 member institutions of which 68 were found by the survey to offer four-year and greater aviation programs. (University Aviation Association, 1992). In the process of calling all 106 member institutions an updated number (68) of institutions that offer four year and higher aviation education programs was obtained.

The first questionnaire requested information of both a quantitative nature and a subjective nature. Student number, faculty demographics, future educational plans, aviation equipment and facilities, intra state student accessibility, and student recruiting were surveyed. More difficult questions were asked of the program\department chairs in which program quality, ranking against a national norm, current program status, factors contributing to quality aviation education, and which institution was considered to offer the best aviation education program in the United States.

The second questionnaire asked aviation program directors to rank key quality factors from most important to least important. These key factors were obtained from the most frequent responses in the telephone interview questionnaire.

Operational Procedures

All of the 68 identified member institutions were contacted by phone to conduct a structured phone interview. Confidentiality was assured to all participants. All institutions were contacted a minimum of four times to maximize responses. If a program director was unable to respond after four attempts, the institution was deleted from the survey. This was strictly random with no bias on the part of the telephone interviewer.

A telephone questionnaire technique allowed subjects to be more open in their responses, and if needed to ask for clarification concerning questions. The telephone technique also encouraged more detailed responses and provided for greater participation than mailed format questionnaires. This procedure may be considered successful if it has greater than the success rate accepted by research authorities of 55% (Perry, 1988).

The telephone questionnaire was written and submitted for evaluation to the researcher's doctoral committee. The recommended changes were then incorporated into a second draft, then it was presented to experts in questionnaire design, and modifications were adopted. The questionnaire was also presented to experts in English and Grammar at Wichita State University, Next it was presented to several program directors at member institutions for input. Finally the final draft was again presented to the doctoral

committee. A small pilot group was then selected and a phone interview was conducted. After several interviews small changes were adapted to clarify and to improve understanding of the questionnaire. One additional question was also added (number 21) as per suggestion of a member of the pilot group. The second (written) instrument underwent a similar process and was approved by the doctoral committee before it was mailed.

The pilot group consisted of a former director of an aviation education program, a member of a nationwide aviation study, and several of the doctoral committee members. The revised final drafts were then presented to the researcher's committee chairman for final approval. Developmental and validation processes were then completed for this instrument.

Research Design and Analysis

The findings of this study, drawing on its qualitative and quantitative data, are presented in a descriptive design. Findings included program age, curriculum offered, future curricular plans, faculty demographics, equipment and aviation facilities, student recruitment, CAA membership, and follow-up of graduates. Subjective responses were also recorded on aviation program quality, national norm rating, factors that constitute a high quality aviation education program, and methods of improving quality of aviation

education. Findings were organized in a descriptive and summarizing format to assure confidentiality to all participants. Special permission was obtained from Wichita State University, the only four year degree program in Kansas, to provide a comparison against nationwide norms that this study established.

CHAPTER IV

FINDINGS AND DISCUSSION

Introduction

This chapter documents the findings and data obtained through the telephone interviews of program directors at colleges and universities that offer a four year or higher degrees in Aviation Education. The results are presented in such a way as to afford a logical, concise method of displaying the collected data. The descriptive data will be presented first, with the more subjective data following.

This research was conducted to establish some norms to provide comparisons of the Kansas Aviation education program against a nationwide basis. As a secondary benefit, this work provides a current status of aviation education programs in the United States. It also discerns quality among aviation program coordinators, that will serve to establish the top aviation education programs in the United States as perceived by the men and women who direct them.

Chapter IV presents the data collected in this study. Conclusions and recommendations are presented in Chapter II. Data were collected by a structured telephone interview (see Appendix A). The questionnaire consisted of a series of

short-answer and open-ended questions that allowed the respondents to evaluate their own aviation education program. Detailed explanation of the procedures followed can be found in Chapter III.

Multiple attempts were made to contact all of the UAA member institutions that offer a four-year or higher aviation education degree. Of the 68 institutions so identified, 57 were contacted. An outstanding response rate of 86.6 percent was obtained. Chapter III of this study further details this process. Program size, highest aviation degree offered, year aviation program established, and options available in the aviation education program are presented in this chapter.

The written survey instrument was then mailed to all 68 member institutions and an response rate of 61.8 percent was obtained with the written instrument.

Four-year Aviation Programs

The following information was obtained from the telephone survey conducted with the 57 institutions so contacted. Thirty-nine institutions offered flight training to at least the private pilot level, 33 offered an Aviation Management program, 30 provided Aircraft Science Management in Airway Science, 24 institutions have Airway Systems Management, 19 offered Airway Computer Science, 13 have Airway Electronic Systems, and finally, only 9 institutions

offered Aviation Maintenance on a four-year basis.

(See Figure 1.)

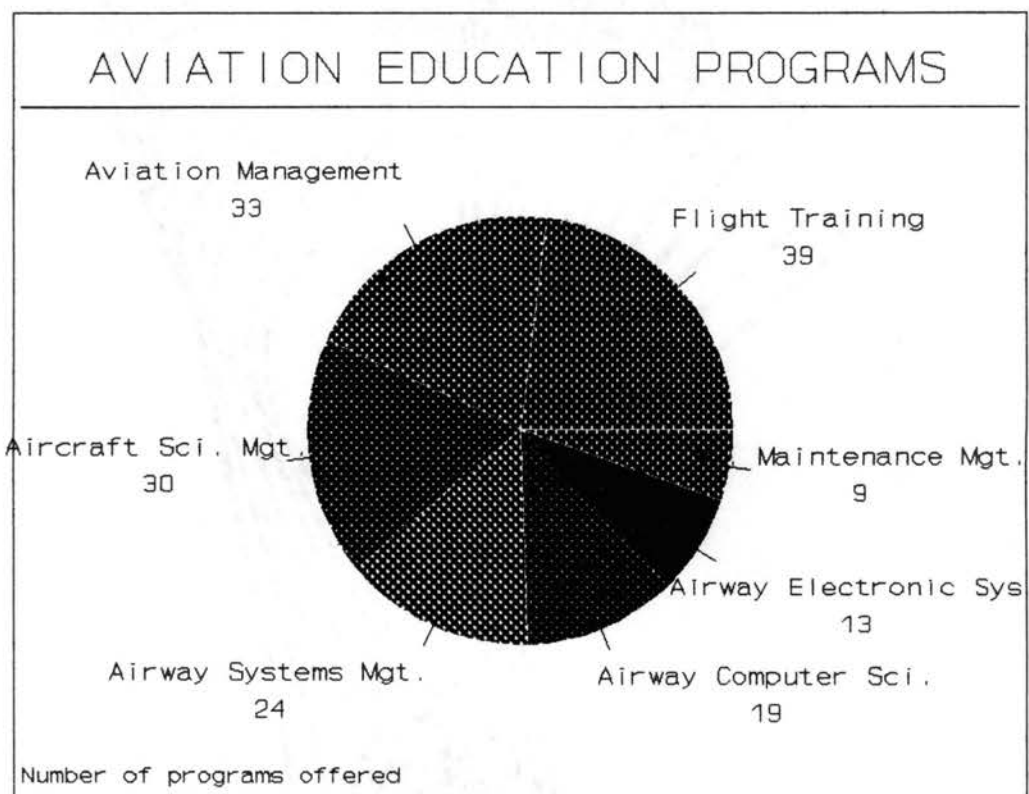


Figure 1.

Aviation Education Program Demographics

Most aviation education programs are offered at colleges and universities that have a student population of 10,000 or over. However, most programs enrolled under 100 aviation students. The survey also found that aviation

programs are relative newcomers to college campuses. Most programs (44) were founded after 1960, and only 12 programs were founded before 1950.

The size of the student enrollment in aviation programs was obtained. Twenty five schools had aviation education programs of less than one hundred students at a baccalaureate level. Twelve colleges had between one 100 and 250 students, and 18 institutions had over 250 students in a four-year aviation program. The following table displays the survey results of student enrollment.

(Table II.)

TABLE II
AVIATION EDUCATION PROGRAM SIZE

| Type Degree | 0-100 students | 100-250 stud. | 250 & Larger |
|-------------|----------------|---------------|--------------|
| Bachelor's | 25* | 12 | 18 |
| Master's | 3 | 0 | 0 |
| Doctorate | 0 | 0 | 0 |

*Number Institutions awarding degree

The member institutions were also surveyed to find the highest aviation degree offered. Degrees with aviation as a minor were excluded. The greatest number of colleges offered only up to a Bachelors degree in aviation. Forty

five colleges and universities offer only a Bachelors of Arts or a Bachelor's of Science in aviation. Three schools offer a Master's level degree, and only one, Oklahoma State University, offers a doctoral degree. This degree is in higher education, not aviation education, but has an emphasis in aviation education. It should be noted that many of the schools offer graduate level classes that may contribute to other degrees in non-aviation departments such as business and education.

It is encouraging to note that 12 colleges and universities aspire to offer higher level degrees than they are presently offering. Seven schools plan to add a master's degree in Aviation, one is planning for a specialist degree, and four universities hope to offer a doctorate degree in two years.

Some aviation education programs are more accessible, or more available, to students outside the institution's state. Some state universities charge much higher tuition to non resident students, and some colleges have quotas or caps in which individuals may not be allowed to enroll because of various reasons. Fifty four program directors described their programs as being accessible. Only one program director indicated a negative response. However, when asked to rate the degree of accessibility, 42 programs were rated very accessible, five were rated somewhat accessible, and four indicated limited accessibility. It

may be noted that while 36 institutions offered some type of aviation scholarships, 20 did not offer aviation scholarships, and one program director was uncertain as to scholarships awarded. Thirteen institutions offered five or less aviation scholarships a year, nine awarded between six and ten, and eight colleges gave between 11 and 25 scholarships yearly. Only three institutions awarded more than 25 scholarships a year.

Faculty Demographics

The majority of Aviation Education programs have between one and five full and part time faculty members. Data were obtained concerning minority and women faculty members. This information was gathered purely for information sake and does not lead to inference of quality. Twenty aviation faculties have between one and five minority faculty members, while thirty four programs have no minority faculty members. Women faculty members instruct in 27 programs, but an equal number of programs have no women faculty members. Additional data are presented in Table III.

Flight Training Equipment And Personnel

Obtaining information about flight training equipment and personnel required some explanation to the program directors. Availability was stressed rather than ownership.

When asked of the number of flight training aircraft available to their program, the interviewer emphasized that aircraft only need be available for use rather than direct ownership. Flight training personnel, both ground instructors and flight instructors, were also counted on the basis of availability. It was not necessary for these instructors to be directly on the institution's payroll. The results are presented in the table IV.

TABLE III
FACULTY DEMOGRAPHICS

| Faculty members (in department) | 1 - 5 | 6 - 10 | 11 & More | None |
|------------------------------------|-------|--------|-----------|------|
| Full time | 29* | 14 | 10 | 3 |
| Part time | 30 | 9 | 7 | 8 |
| Minority | 20 | 0 | 0 | 34 |
| Women | 26 | 0 | 12 | 7 |
| > Bachelor's Degree | 29 | 11 | 11 | 2 |
| > Master's Degree | 30 | 4 | 21 | 8 |

*Number of institutions with members in above categories.

TABLE IV
FLIGHT TRAINING PERSONNEL AND EQUIPMENT

| Number of: | 1-5 | 6-10 | 11-25 | 26 & Up |
|------------|----------|----------|----------|----------|
| Aircraft | 5 prog.* | 8 prog. | 22 prog. | 15 prog. |
| Simulator | 40 prog. | 5 prog. | 3 prog. | None |
| Flt. Inst. | 9 prog. | 15 prog. | 12 prog. | 15 prog. |
| Gnd. Inst. | 23 prog. | 8 prog. | 7 prog. | 7 prog. |

*Number of aviation programs

Perceived Quality of Aviation Education Programs

Aviation education program directors were asked to rate their programs on a scale of one to five as compared to similar programs. With five being highest, the majority rated their programs a five. The composite number obtained was 4.42, indicating that program administrators view their programs as being very high quality. Thirty three directors rated their programs higher than a 4.0, fifteen rated higher than 3.0, and only seven rated their programs at 3.0 or less. These seven all rated between 2.1 and 3.0. No respondents rated their program 2 or less. It can be stated that aviation education programs, as perceived by their directors, are of above average quality. The directors then rated their aviation education program against a perceived national norm. See information in Table V.

TABLE V
PERCEIVED RATING AGAINST NATIONAL NORM

| Rating | Number of Programs |
|-------------------------|--------------------|
| One of the best | 31 |
| Better than most | 13 |
| Average | 11 |
| Somewhat below the norm | 1 |
| One of the worst | 0 |

Over half (55%) of the directors considered their programs to be one of the best in the nation. This is subjective data, but it indicates the perception that these programs are of high quality.

Program directors were then asked their opinion as to which four-year aviation program was the best in the United States. The University of North Dakota was listed as best by twenty two directors. Embry-Riddle University was rated best by 14 program directors. Purdue was next with ten. Institutions that were nominated only once by program administrators were not listed. The top seven listed in order with number of "votes" are listed in Table VI. It is interesting to note that six of these top seven institutions offer Airway Science Curriculums.

TABLE VI
TOP RATED FOUR-YEAR PROGRAMS

| Institution | Ranked first by: (# of Inst.) |
|---------------------------------------|-------------------------------|
| University of North Dakota | 22 |
| Embry-Riddle Aeronautical University | 14 |
| Purdue University | 10 |
| Parks College of St. Louis University | 6 |
| The Ohio State University | 4 |
| University of Nebraska at Omaha | 2* |
| Southern Illinois University | 2* |

* Denotes tie between sixth and seventh place

Program directors were then asked to indicate which program, at the master's degree level or higher, they considered to be the best in the country. Embry-Riddle Aeronautical University was mentioned the most by eleven directors. It is important to note that many directors either had no opinion or did not know which institutions offered master's degree programs. The ranking of the top three aviation education programs follows. (Table VII.)

TABLE VII
TOP RANKED MASTER'S AND HIGHER PROGRAMS

| Institution | Ranked first by: (# of Inst.) |
|--------------------------------------|-------------------------------|
| Embry-Riddle Aeronautical University | 11 |
| Oklahoma State University | 3* |
| Southern Illinois University | 3* |

*Denotes tie between second and third place

Program directors were asked to compare their own program, on a scale of one to five, with the program they picked as best in the United States. Twenty programs were rated equal to the best in the country with a rating of 5.0. One program was rated at 4.9, another at 4.5. Six programs were rated at 4.0, one at 3.5, seventeen received a rating of 3.0, and two programs rated themselves at 1.0 and 2.0. Perceived quality is again shown to be of above average or average in all but two programs in the United States.

Directors were asked next to characterize their aviation program as growing, remaining constant, or declining in student number. Forty four programs were described as growing, nine were remaining constant, and three were declining. Many reasons were given by program directors for the growth, status, or decline of student enrollment. Similar responses are grouped together for brevity and convenience of the reader.

Reasons for Growth

(Listed in order of number of times cited)

High quality program
 Continuing program exposure
 New program
 Good recruiting practices
 Good location in state
 Growth in aviation job market
 Only four-year program in state
 Good airport facilities
 Unique or new curriculum
 Located in Aviation minded state

Reasons for Static Growth

(Listed in order of number of times cited)

Limited by facilities
 Poor local economy
 Declining aviation factors
 Curricular change in program
 Local program only

Reasons for Declining Student Enrollment

(Reasons cited equally)

Decline of aviation industry
 Increasing cost of private education
 Program declining in quality

Loss of program director
Uncertainty of program continuation

Student Services

Program directors were asked if their programs actively recruit students. Forty three answered in the affirmative, while only 12 gave a negative response. The 43 respondents that answered yes, were then asked to describe how they recruit students in the second part of the question. The following table indicates the responses and the number of times each response was given. (Table VIII)

TABLE VIII
AVIATION EDUCATION RECRUITING METHODS

| Method | # Institutions using method |
|--------------------------------------|-----------------------------|
| College Recruiting Teams | 24 |
| Direct Mail | 14 |
| Other Programs* | 14 |
| National Advertising | 12 |
| Regional Advertising | 5 |
| Articulation with Community Colleges | 2 |

*Other programs included job fairs, high school visits, guest speaking, and etc.

Questionnaire respondents were then asked if their Aviation Education programs provide follow-up services on their graduates. Fifty directors responded that they provide some type of follow-up or post graduation communication with their graduates. Four directors responded that no follow-up occurs in their institutions. The following table presents the frequency of graduate follow-up in the Aviation Education programs polled. (Table IX)

TABLE IX
FOLLOW-UP FREQUENCY OF PROGRAM GRADUATES

| Number of follow up contacts | # of Institutions |
|--------------------------------|-------------------|
| More than once a year | 9 |
| Once a year | 20 |
| Once every two years | 5 |
| Less than once every two years | 3 |
| Uncertain | 5 |
| New Program | 3 |

It is important to note that over half (34) of the programs provide follow-up communications with their graduates every two years or more.

One question was asked of survey respondents at the request of one of the early interviewed program directors. It was requested that member institutions of the University Aviation Association be surveyed concerning their membership of the newly formed Council on Aviation Accreditation (C.A.A.). Twenty five institutions were found to be members of the C.A.A., while 26 institutions were not members. Of these 26 institutions, 16 program directors indicated that they plan to join the C.A.A. in the future, seven were uncertain about joining, and only three indicated that they did not plan to join the Council on Aviation Accreditation.

Factors Contributing to the Quality of Aviation Education

One question asked of program directors in this survey was what factors did they feel constitute a good aviation program. The question was completely open ended. For brevity similar responses were combined. The following, in order of number of times mentioned, is listed below:

Factors Associated with the Quality of Aviation Education

(Listed in order of number of times cited)

High Quality Faculty

Good Overall Program

High Quality Facilities

High Quality Students

Strong Flight Simulator Department

Academic Support

Concentration of Aviation Studies

Networking with Aviation Industry

Student Job Placement

Blend of Liberal Arts Curriculum

Student Oriented Faculty

Professional Program

General Business Background

Internships in Industry

Good Communication Skills

New Curriculum

Adequate Funding of Program

Program Safety

Other Factors*

*Eight other responses recorded in survey mentioned only once, and are not listed in above factors.

The next survey question asked the respondent to comment on factors that make a high quality aviation education. The question was, "What do you feel is necessary in order to provide excellence in Aviation Education?" This is similar to the preceding question, however the word excellence was emphasized by the interviewer. Some of the same responses occur in the next list, however it is interesting to note that many different responses were obtained when excellence was in fact substituted for good.

Necessary Factors to provide
Excellence in Aviation Education

(Listed in order of number of times cited)

High Quality Faculty
 High Quality Facilities
 Networking with Aviation Industry
 High Quality Aviation Program
 Academic Support
 Adequate Funding of Program
 Professional Program
 Conduct Research in Aviation
 Program contain Interested Students
 Variety of Aviation Courses Offered
 Student Oriented Faculty
 Industry Involvement in Curriculum
 Provide Job Placement Services
 Greater Emphasis on Aviation Safety
 Promote Critical Thinking Skills in Students
 Provide Internships in Aviation Industry
 Provide More Financial Aid To Students
 Other Factors*

*Seven other responses recorded in survey mentioned only once, and are not listed in above factors.

Program directors were then asked, "If you had unlimited resources, what three changes would you make in the Aviation Education program at your institution?" The

most answered response was to improve facilities. The following list describes the responses given:

Proposed Improvements in Aviation Education
(Listed in order of number of times cited)

Improvement of Facilities

Improvement and Addition of Flight Simulators

Increase Faculty Number

Increase number of Available Aircraft

Improve Teaching Aids

Increase number of Aviation Programs

Increase Student Recruitment

Increase Marketing Budget

Increase number of Hands On Activities

Provide More Student Internships

Increase Faculty Travel

Improve Student Placement System

Increase Industry Involvement

Add Masters Degree Program In Aviation

Increase Library Resources

Initiate Research Center

Increase Number of Field Trips

Offer Additional Scholarships

Increase Faculty Development Programs

Other Factors*

*Five other responses recorded in survey mentioned only once, and are not listed in above factors.

The top 12 responses of each of the three preceding lists were then organized into a written questionnaire (see appendix B.) which was mailed to the UAA member institutions with four-year degree programs. These three questions were considered to be of greatest importance to establishing the norm of quality aviation education throughout the United States. The top 12 responses were chosen to make the ranking by the program directors less difficult. All responses that were recorded more than twice on the original survey were included. The ranking of each of the top 12 groups of responses in a written format allowed for both a reaffirmation of previous oral responses and the opportunity to rank the other respondents opinions.

Forty two program directors returned the survey. This is a response rate of 61.8%. When asked to rank the factors of a high quality aviation education the following responses were obtained. (See Table X) The following method was employed to determine rank. A point system was used in the following manner. When a factor was ranked first, twelve points were awarded to this factor. If that factor ranked second, eleven points were awarded. This system was applied down to the lowest rated factor, which received only one point. By using this method rank can be established, by noting the factor that obtains the highest number of points. The factors are also listed in order from highest to lowest. The following table summarizes the responses. (Table X)

TABLE X
FACTORS OF HIGH QUALITY AVIATION EDUCATION PROGRAMS

| Statement | Points |
|------------------------------------|--------|
| High Quality Faculty | 437 |
| Good Overall Program | 350 |
| Student Oriented Faculty | 334 |
| High Quality Students | 319 |
| Academic Support | 316 |
| Professional Program | 272 |
| High Quality Facilities | 260 |
| Networking With Aviation Industry | 258 |
| Concentration Of Aviation Studies | 204 |
| Student Job Placement | 196 |
| Blend Of Liberal Arts Curriculum | 191 |
| Strong Flight Simulator Department | 143 |

The survey responses indicated that a high quality faculty is the number one response by a large factor. This was the most cited factor and was ranked by the mail survey also as the number one factor. A good overall program was the second highest cited response, and it was also second highest in the mail survey. However, the third ranked response was student oriented faculty which ranked eleventh in the phone survey. Fourth place in the mail survey was high quality students, with academic support following. The

top ranked six responses are as follows:

Factors of High Quality Aviation Education Programs

(Top Six Responses)

High Quality Faculty

Good Overall Program

Student Oriented Faculty

High Quality Students

Academic Support

Professional Program

Survey respondents were then asked to rank the necessary factors to provide excellence in aviation education. The following table provides the results by the use of the point system as previously described. (Table XI)

TABLE XI

NECESSARY FACTORS TO PROVIDE EXCELLENCE
IN AVIATION EDUCATION

| Statement | Points |
|-------------------------------|--------|
| High Quality Faculty | 430 |
| Student Oriented Faculty | 372 |
| High Quality Aviation Program | 333 |
| Adequate Funding Of Program | 322 |

| | |
|--------------------------------------|-----|
| Academic Support | 311 |
| Professional Program | 287 |
| Program Contains Interested Students | 250 |
| High Quality Facilities | 220 |
| Industry Involvement in Curriculum | 213 |
| Networking with Aviation Industry | 206 |
| Variety of Aviation Courses Offered | 204 |
| Conduct Research In Aviation | 101 |

High quality faculty was the number one ranked response in both the telephone survey by citation and in the mail survey by ranking. The second highest cited response high quality facilities did not make it to the top six responses falling to eighth place in the mail survey ranking. The mail survey ranked a student oriented faculty as the second highest response which barely made the top twelve factors of the original list. The top six necessary factors to provide excellence in aviation education are as follows:

Necessary Factors To Provide
Excellence In Aviation Education

(Top Six Responses)

High Quality faculty

Student Oriented Faculty

High Quality Aviation Program

Adequate Funding of Program

Academic Support

Professional Program

Finally program directors were asked to rank twelve proposed improvements in aviation education. The following table represents by the aforementioned point system the rank established by the mailed survey: (Table XII)

TABLE XII

RECOMMENDED IMPROVEMENTS IN AVIATION EDUCATION

| Statement | Points |
|---|--------|
| Provide More Student Internships | 348 |
| Increase Faculty Number | 345 |
| Increase Number Of Hand On Activities | 332 |
| Improve Teaching Aids | 318 |
| Improve Student Placement System | 302 |
| Improvement Of Facilities | 300 |
| Increase Student Recruitment | 274 |
| Improvement And Addition Of Flight Simulators | 240 |
| Increase Marketing Budget | 233 |
| Increase Number Of Available Aircraft | 207 |
| Increase Faculty Travel | 168 |
| Increase Number Of Aviation Programs | 159 |

Surprising to the author the number one ranked response was to provide more student internships. Not that this is

not a good response, but it almost did not make the top twelve cited list, coming in at tenth place. Also improvement of facilities the number one cited response fell to sixth place in the mailed survey. The following list represents the top six ranked proposed improvements in aviation education:

RECOMMENDED IMPROVEMENTS IN AVIATION EDUCATION

(Top ranked six factors)

Provide More Student Internships

Increase Faculty Number

Increase Number of Hands on Activities

Improve Teaching Aids

Improve Student Placement System

Improvement of Facilities

Aviation Education In Kansas

This study has now established what factors are required to provide a quality aviation education. These qualities can now be compared to the aviation education program in Kansas on a case study basis. Program directors have also established which improvements should be made in aviation education to increase the quality of programs.

A comparison of the Aviation Management Program at Wichita State University (WSU) can now be made with the information obtained with this survey. Wichita State's student enrollment is approximately 16,000, this is within

the norm in that most institutions have a student population of greater than 10,000. Most programs are small consisting of less than one hundred students, Wichita State has approximately 60 students in the aviation program. Wichita State offers up to a Master's of Business Administration and allows some aviation classes to be included in this degree. This is not an aviation education degree therefore the four-year degree is within the national norm. Wichita State does not plan to offer a higher aviation degree within two years. Wichita State's program began in 1970, while most programs started nationally between 1950 and 1980. Present faculty at WSU consists of three adjunct faculty and zero full time, women, minority, and faculty higher than a master's. Two faculty do have degrees higher than a baccalaureate. In this area WSU ranks below the national norm.

Rated on a scale of 1 to 5 with five being highest Wichita State received a 3. Compared with the national average of 4.42, this shows WSU below the national average. WSU was rated average by its' program director against a nationwide norm. Only 12 programs were rated average or below average, most programs (44) were rated better or best. No aviation scholarships are available at WSU. Thirty six institutions offer scholarships compared to twenty that do not. The aviation program at WSU was characterized as declining due to the uncertain future of the program, and the loss of the program director. Only three programs in

the country were listed as declining. Wichita State was rated at three compared to the best institutions in the United States. Seventeen institutions rated a three while only two rated below a three. Forty five institutions rated four and above. Wichita State is rated below the norm.

Wichita State was listed as not being accessible to students from other states. Fifty four programs nationwide were rate as accessible to students from other states. Wichita State actively recruits students by local advertising, direct mail, campus newspaper and on-campus promotions. There is no graduate follow up at Wichita State. Only four institutions do not follow up on their graduates in the United States. Finally, Wichita State has one flight training aircraft, two flight training simulators, two certified flight instructors, three certified ground instructors and again offers no aviation scholarships. Nationwide 37 institutions have more than 11 flight training aircraft, 45 have between 1 and 10 flight training simulators, 42 have six or more certified flight instructors, 23 have six or more certified ground instructors, and 33 institutions offer 1 or more aviation scholarships. Wichita State is again below the nationwide norm.

Wichita State University can be said to be below the norm in comparison with a nationwide norm as established by this study. Four-year aviation education programs will not

be available in the State of Kansas if the Wichita State program is allowed to perish, Additional secondary certification in aviation education also may not be available in Kansas if Wichita State's Aviation Management program is discontinued. The future at this time is uncertain for this program, but it is likely that the Aviation Management program at WSU will be discontinued. Because of this uncertainty, this has lowered the perceived rating of the program. It is reasonable to assume that if this survey was conducted two years ago, the results would have been more positive.

An additional benefit of this study is the establishment of a series of national norms as perceived by program coordinators. The University of North Dakota was found to be the top rated four-year program in the United States. Similarly, in the master's degree granting field, Embry-Riddle was found to rate the highest. The perceived average quality rating on a scale of 1-5 was found to be 4.42 against a national norm. Finally, many factors were discovered that are listed in this study that may be of use to other program directors that wish to compare their own program against the findings of this study. Aviation Education is a growing field, and even if Wichita State University discontinues the Aviation Management degree, Kansas State University at Salina may offer four-year degree programs in the near future.

CHAPTER V

SUMMARY, FINDINGS, AND RECOMMENDATIONS

This study has attempted to obtain valuable information from program coordinators at four year aviation education degree programs throughout the United States. Information gained through this study should provide aviation education program directors insight into the most important factors involved in providing a high quality aviation education. This information may also be of use to the entire aviation industry, and finally the information gathered in this study may be of benefit to aviation education in Kansas.

SUMMARY

This study was initiated to obtain four research objectives. They are as follows; (1) to identify a norm for comparison of aviation education programs in varying aspects of quality, (2) to establish the views, opinions, needs, and suggestions of member program coordinators toward improvement of aviation education, (3) to survey the present state of aviation education, and (4) to offer possible alternative solutions for improvement and enhancement of Kansas Aviation programs.

Findings

This study established that the number one factor, both by citation and ranking by program directors, was the need of a high quality faculty in an aviation education program. This study also established a perceived national quality ranking on a scale of 1 - 5, of 4.42, indicating program directors view their programs as being of high quality. Further, when asked to rate their program against a perceived national norm 31 directors viewed their programs as one of the best in the Nation. Program directors also were asked to provide information, based on their opinion, as to the best aviation education program at both a four year level and at masters and higher. University of North Dakota and Embry-Riddle were perceived as highest quality respectively. Both of these institutions were the top rated two in both categories, and both offer Airway Science Curriculums.

This study established the views, opinions, needs, and suggestions of programs coordinators towards building a higher quality aviation education. The highest rated improvement factor was the need for more student internships. This is something that can be implemented or expanded at aviation programs throughout the United States with little difficulty at existing programs. The other proposed improvement can be implemented as needed within the context of the programs involved.

The demographic nature of the aviation education programs throughout the United States varied greatly. Most programs were found to contain less than 100 students. Most programs were relative new, founded after 1960. Most programs offered only up to a four-year degree, and most programs were considered to be accessible to students from other states. Most programs had five or less full time faculty members, and women faculty members were better represented in aviation education programs than minority faculty members. Finally, most aviation education programs throughout the United States were characterized as growing.

The results of this study provide input into the improvement of the only four-year aviation program in the State of Kansas. If the decision is made to continue this program at Wichita State, then this study can provide a blueprint for the enhancement of a high quality aviation education program.

Recommendations

It is recommended that program directors read this study and compare their own program against the norms established by this study. Necessary changes then can be made in order to provide an overall enhancement in quality, and improve those factors that this study indicates as deficient. A direct comparison should be made by each program director of his/her own aviation program in a manner

similar in which the program at Wichita State University was compared to the national norm. Necessary changes then can be made that represent an improvement toward a nationwide established norm, rather than trying something just because it seems positive.

The first recommendation for Wichita State is to hire a full time faculty member. This new program director will have at his/her disposal this study, which will provide a direction toward establishing a high quality aviation education department. This director will provide continuity, that is lacking in a department consisting of all adjunct professors. The second recommendation is to establish a student internship program at Wichita State. Wichita is an excellent place for an internship program with many aviation firms located in the area. The third recommendation is to provide hands on type learning activities. As with the internship program recommended above, more real world experiences should also be incorporated. The fourth recommendation is for the faculty, both full time and adjunct, to evolve into a more student oriented position. The fifth recommendation is to initiate some type of aviation career placement system. All of the above recommendations are student centered. The data collected in the surveys, suggests that the path to excellence in aviation education is to concentrate on the student above anything else.

The final recommendation is to adapt the curriculum at Wichita State to the nationwide curricula of the Airway Science curriculum. Six out of seven of the highest ranked Aviation institutions offer Airway Science. The Aviation Management degree should become the Airway Science Management degree. All efforts can then be channeled to provide an improved curriculum. These recommendations are necessary to help ensure the continuance of the aviation education program at Wichita State University.

It is the author's opinion that other aviation education programs can benefit from the findings of this study. Every institution should have an internship program that immerses the student into an aviation environment. The faculty in the aviation education department should strive to be student oriented, but not at the expense of high academic standards. The program should be professional and network with the aviation industry. The curriculum should be Airway Science, but personalized to each institution's strengths. The program should be funded by a variety of sources including both federal and state governments. Finally the student should be recruited based on a desire for success in the aviation environment. Motivated students desirous of success will ensure a high quality program. Learning tools such as hands on teaching tools are highly recommended. The technical nature of aviation requires this above many other disciplines. The role of aviation is

essential in the modern world, and aviation education will support aviation by providing the work force.

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APPENDIXES

APPENDIX A

AVIATION EDUCATION TELEPHONE SURVEY

AVIATION EDUCATION TELEPHONE SURVEY

Aviation Education questionnaire/telephone interview

Institution name _____

Street Address _____

Contact person _____

Title _____ Phone _____

Date _____ Time _____

1. What is the size of your parent institution? _____

2. How many Aviation education students are currently

enrolled? AS _____, BS _____, MBA _____, MS _____,
Ed.D. _____, Ph.D. _____,
Other _____ (if so, please specify)

3. What is the highest aviation degree offered?

Circle one: AS BS MBA MS Ed.D Ph.D

4. Within the next two years, does your institution plan to offer any higher level Aviation education degrees than presently offered? Yes _____ No _____. If yes what? (circle) BS, MBA, MS, Ed. D., Ph. D., Other _____

5. What year was your aviation program established? _____

6. Faculty demographics:

Number of full time aviation faculty _____

Number of part time aviation faculty _____

Number of minority aviation faculty _____

Number of women aviation faculty _____

Number of aviation faculty with degree higher than baccalaureate _____

Number of aviation faculty with degree higher than masters _____

7. Using a scale of 1 to 5 with 5 being highest quality how would you rate your aviation program as compared to other similar programs? 1 2 3 4 5

8. How do you feel your aviation program would rate against a nationwide norm? _____ One of the best
_____ Better than most
_____ Average
_____ Somewhat below the norm
_____ One of the worst

9. Does your institution offer any aviation education scholarships? Yes No If so, what types?

10. Would you characterize your aviation education program as growing, remaining constant, or declining in student number? (circle one) What factors do you attribute this to?

11. What factors constitute a good Aviation Education program?

12. What do you feel is necessary in order to provide excellence in Aviation Education?

13. If you had unlimited resources, what three changes would you make in the Aviation Education program at your institution?

14. What options are available in your Aviation Education program? (Check those that apply)

Aviation Management Program_____

Flight Training_____

Aircraft and Powerplant Training_____

Airway Science:

Airway Science Management_____

Airway Computer Science_____

Aircraft Systems Management_____

Airway Electronic Systems_____

Aviation Maintenance Management_____

Other_____

15. What institution in your opinion offers the best aviation education in the United States...

In four year programs?_____

At masters level or higher?_____

16. How would you rate your institution in relation to one or more of the preceding best institutions on a scale of 1-5 with 5 being the aforementioned institution? 1 2 3 4 5

17. How many of the following are available in your program?

Flight training aircraft_____

Flight training simulators_____

Certified Flight instructors_____

Certified Ground instructors_____

Aviation Scholarships_____

18. Would you describe your program as being accessible to students from other states? Yes _____ or No _____. If yes, to what degree do you rate your institution's accessibility?

Very accessible _____
Somewhat accessible _____
Limited accessibility _____

19. Do you actively recruit students? Yes _____ No _____.

If so, how? _____

20. Do you follow-up on graduates? Yes _____ No _____.

If so, how frequently? _____

21. Is your institution currently a member of The Council on Aviation Accreditation? Yes _____ No _____ Do you plan to join in the future? Yes _____ No _____

APPENDIX B

FOLLOW-UP WRITTEN QUESTIONNAIRE

FOLLOW-UP WRITTEN QUESTIONNAIRE

Robert M. Kuhns
 125 S. Hillside
 Wichita, KS 67211
 316 682-1921

February 26, 1993

Dear Colleague:

Early this summer I contacted you by phone to participate in my doctoral dissertation study about aviation education. Those of you that participated in the previous study provided me with some interesting results. Three key questions of the survey have been paraphrased below with their most frequent responses. Please rank (1-12) the responses in order of importance (1 being the most important) and return your response to me in the self addressed stamped envelope.

Statement: Factors of High Quality
Aviation Education Program

Rank (in order of importance)

| | |
|-------|------------------------------------|
| _____ | Concentration of Aviation Studies |
| _____ | Blend of Liberal Arts Curriculum |
| _____ | High Quality Faculty |
| _____ | Professional Program |
| _____ | High Quality Facilities |
| _____ | High Quality Students |
| _____ | Strong Flight Simulator Department |
| _____ | Academic Support |
| _____ | Good Overall Program |
| _____ | Networking with Aviation Industry |
| _____ | Student Job Placement |
| _____ | Student Oriented Faculty |

Statement: Necessary Factors to provide
Excellence in Aviation Education

Rank (in order of importance)

| | |
|-------|-------------------------------------|
| _____ | Variety of Aviation Courses Offered |
| _____ | Professional Program |
| _____ | High Quality Facilities |
| _____ | Networking with Aviation Industry |
| _____ | High Quality Aviation Program |
| _____ | Academic Support |
| _____ | Adequate Funding of Program |
| _____ | Industry Involvement in Curriculum |
| _____ | Conduct Research in Aviation |
| _____ | Program contain Interested Students |
| _____ | High Quality Faculty |
| _____ | Student Oriented Faculty |

Statement: Proposed Improvements in Aviation Education

Rank (in order of importance)

| | |
|-------|---|
| _____ | Increase number of Hands On Activities |
| _____ | Improve Teaching Aids |
| _____ | Improvement and Addition of Flight Simulators |
| _____ | Increase Faculty Number |
| _____ | Increase number of Available Aircraft |
| _____ | Improve Student Placement System |
| _____ | Increase number of Aviation Programs |
| _____ | Increase Student Recruitment |
| _____ | Increase Marketing Budget |
| _____ | Improvement of Facilities |
| _____ | Provide More Student Internships |
| _____ | Increase Faculty Travel |

In order that I may complete my doctoral dissertation research in a timely manner please respond as quickly as possible. A control number has been assigned so that I may track responses. Your response will be kept confidential.

Thank you,

Robert M. Kuhns

APPENDIX C

FOUR-YEAR COLLEGES AND UNIVERSITIES ON
UAA MEMBERSHIP LIST - APRIL 1992

FOUR-YEAR COLLEGES AND UNIVERSITIES
ON UAA MEMBERSHIP LIST - APRIL 1992

(Institutions contacted in survey)

Andrews University
Aviation Department
Berrien Springs, MI 49104

Department of Aeronautical Technology
Arizona State University
Tempe AZ 85287-6406

Auburn University
Aero Eng., 162 Wilmore Labs
Auburn University, AL 36849-5338

Averett College
420 W. Main St.
Danvill, VA 24541

Baylor University
P.O. Bx. 97440
Waco, TX 76798-7440

Technology Annex, BGSU
Bowling Green State University
Bowling Green, OH 43403-0307

Bridgewater State College
Maxwell Library
Bridgewater, MA 02324

Central Missouri State University
Warrensburg, MO 64093

Central Washington University
Flight Technology
Ellensburg, WA 98926

Chadron State College
10th and Main
Chadron, NE 69337

College of Aeronautics
La Guardia Airport
Flushing, NY 11371

Concordia Univ. Wisconsin
12800 N. Lake Shore Dr.
Mequon, WI 53092-7699

Daniel Webster College
20 University Dr.
Nashua, NH 03063

Delaware State College
202 Kent Hall, DuPont Highway
Dover, DE 19901

Delta State University
P.O. Bx. 3203, DSU
Cleveland, MS 38733

Dowling College
Aero & Airway Sci. Bldg.
Oakdale, NY 11772

Eastern Kentucky University
Aviation Prog-Stratton Rm 249
Richmond, KY 40475-3131

Elizabeth City State University
ECSU, Bx 823
Elizabeth City, NC 27909

Embry-Riddle Aeronautical University
600 S. Clyde Morris Blvd.
Daytona Beach, FL 32114-3900

Fairmont State College
MATEC
Fairmont, WV 26554

Florida Institute of Technology
150 W. University Blvd.
Melbourne, FL 32901-6988

Florida Memorial College
15800 NW 42nd Ave.
Miami, FL 33054

Geneva College
College Avenue
Beaver Falls, PA 15101

Georgia State University
P.O. Bx. 4018
Atlanta, GA 30303-3083

Golden Gate University
536 Mission St.
San Francisco, CA 94501

Hampton University
Airway Science Program
Hampton, VA 23668

Henderson State University
HSU Box 7611
Arkadelphia, AR 71923

Indiana State University
Classroom Bldg. Room 103
Terre Haute, IN 47809

Jackson State University
P.O. Bx. 18480
Jackson, MS 39217

Kent State University
212 Van Duesep
Kent, OH 44243

Lewis University
Route 53
Romeoville, IL 60441-2298

Louisiana Tech University
P.O. Bx. 3181, Tech Station
Ruston, LA 71272-9989

Lynn University
3601 N. Military Trail
Boca Raton, FL 33431-5598

Metropolitan St. College of Denver
Campus Box 30, P.O. Box 173362
Denver, CO 80217-3362

Middle Tennessee State Univ.
Box 67, Aerospace Dept.
Murfreesboro, TN 37132

National University
4141 Camino del Rio South
San Diego, CA 92108

Nicholls State University
P.O. Bx. 1222
Thibodeaux, LA 70302

Norfolk State University
2401 Corprew Ave. Comp. Sci.
Norfolk, VA 23504

Northeast Louisiana University
Dept. of Avn, 700 University Dr.
Monroe, LA 71209

Ohio University
Ohio University Airport
Athens, OH 45701

Oklahoma State University
300 N. Cordell, OSU Aviation
Stillwater, OK 74078-0422

The Ohio State University
Box 3022
Columbus, OH 43210-0022

University Of Alaska, Anchorage
3211 Providence Dr.
Anchorage, AK 99508

University Of Dubuque
2000 University Ave.
Dubuque, IA 52001

University Of Illinois
Willard A/P, 1 Airport Rd.
Savoy, IL 61874

University Of Maryland Eastern Shore
AWS Dept., Backbone Rd.
Princess Anne, MD 21853

University of Nebraska at Omaha
60th & Dodge Streets
Omaha, NE 68182-0508

University of Nebraska-Kearney
Bus. Dept. West Campus, WCE202
Kearney, NE 68849

University Of North Dakota
Box 8216 University Station
Grand Forks, ND 58202

University of the District of Columbia
4200 Connecticut Avenue, NW
Washington, DC 20008

University of Oklahoma
1700 Lexington
Norman, OK 73069

Parks College of St. Louis
Cahokia, IL 62206

Purdue University
Aviation Tech. Dept.
West Lafayette, IN 47906

Rocky Mountain College
1511 Poly Drive
Billings, MT 59102

San Jose State University
One Washington Sq.
San Jose, CA 95192-0081

Southeastern Oklahoma State University
Station A, Box 4136, Aerospace
Durrant, OK 74701

Southern Illinois University
Air Institute & Services
Carbondale, IL 62901

St. Cloud State University
HH201 720 S. 4th Ave
St. Cloud, MN 56301-4498

St. Francis College
180 Remsen Street
Brooklyn Heights, NY 11201

Tennessee State University
3500 John A Merritt Blvd.
Nashville, TN 37209-1561

Texas Southern University
3100 Cleburne Ave.
Houston, TX 77004

Utah State University
ITE Dept.
Logan, Utah 84322-6000

Wentworth Institute of Technology
550 Huntington Ave.
Boston, MA 02115

West Liberty State College
West Liberty, WV 26074

Western Michigan University
Dept. of Engr. Tech.
Kalamazoo, MI 49008

Wichita State University
Nat. Inst. for Av. Research
Wichita, KS 67208

Wilmington College
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Winona State University
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VITA ²

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Wife: Brenda. Children: Cynthia Kay.

Education: Graduated from Southeast High School,
Wichita, Kansas, in June, 1970; received Bachelor
of Arts degree in Physical Science from Wichita
State University in June, 1974; received Master
of Science degree in Education in August 1979 from
Wichita State University; completed requirements
for the Doctor of Education degree at Oklahoma
State University in July, 1994.

Professional Experience: Adjunct Assistant Professor
of Aviation Management, Barton School of Business,
Wichita State University since 1992. Small
business owner since 1985. Education specialist,
Lake Afton Public Observatory, 1981-1984. Former
secondary level public school teacher in science,
1974-1981.

Professional Organizations: Aerospace Ambassadors,
Aerospace Education Member Civil Air
Patrol, Alpha Eta Rho Professional Aviation
Fraternity, Aircraft Owners and Pilots
Association, University Aviation Association,
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Commission on Aerospace Education, Kansas
Pilots Association, Pilots International
Association, Wichita Aeronautical Historical
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FAA Ratings: Private Pilot, Instrument Rated.
Basic, Advanced, and Instrument Ground Instructor.
Aviation Education Counselor. Wings Level 1, 2,
and 3