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Identifying Indicators of Program Quality in U.S. Baccalaureate Aviation Programs

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**IDENTIFYING INDICATORS OF PROGRAM QUALITY IN U.S.
BACCALAUREATE AVIATION PROGRAMS**

by

Paul Douglas Lindseth

**A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Education)
in the University of Michigan
1996**

Doctoral Committee:

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1996

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DEDICATION

**This dissertation is dedicated to my
loving wife Glenda,
for her ceaseless encouragement;
to our son Brad, for his understanding;
and to my parents for the solid foundation they laid for me.**

I,
ACKNOWLEDGEMENTS

Special thanks to each of my committee members for their thoughtful guidance and helpful insights.

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CHAPTER I

INTRODUCTION

Statement of Problem

Professional baccalaureate aviation programs have increased in numbers during recent years throughout the United States. In 1968 there were approximately twenty baccalaureate aviation education programs in the country according to the University Aviation Association (UAA), the only professional organization representing the non-engineering element in collegiate aviation

(UAA, 1989, 1994). Today there are 70 baccalaureate aviation programs (See Appendix A) in the country offering flight education in conjunction with a four year degree (UAA, 1994). Other related specializations offered by these baccalaureate aviation programs include airport management, aviation administration, aviation maintenance management, and air traffic controller education.

A rapid expansion of America's air transportation industry from 1 82 million passenger miles flown in 1982 to over 400 million passenger miles flown in 1991 (Wells, 1993) is a main factor for the increased number of aviation programs along with a decreasing number of ex-military pilots since

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the 1970s (Federal Aviation Administration [FAA], 1993). The significant increase in passenger miles flown requires a greater number of aviation personnel along with more sophisticated technology and equipment to operate in the same amount of airspace. As a result, aviation professionals must be more knowledgeable, better prepared, and more capable of making critical decisions to continue to ensure the safety of passengers, flight crew members, and the general public. Because pilots, aviation and airport managers, administrators, and air traffic controllers are in command of hundreds to thousands of lives daily, these professionals need superior preservice programs. Having aviation professionals prepared through quality academic programs is essential for the safe operation of today's and tomorrow's air transportation industry.

Currently U.S. baccalaureate aviation programs receive optional guidance from the UAA. The UAA and the FAA teamed up with the aviation industry in 1982 and formulated a baccalaureate program called the airway science degree (UAA, 1991). The purpose of this degree was to help curb the shortage of aviation professionals after the air traffic controllers' strike of 1981. Aviation programs can offer the airway science degree in conjunction with other degrees in their aviation programs. The team approach used in establishing this degree provided increased standardization in curricula among colleges and universities offering these programs since guidelines come from the FAA through the UAA.

The activities of the UAA, FAA, and airline industry brought about curricula standardization but few measures of quality control have been implemented, especially in light of the increasing numbers of programs that have originated since 1968 (UAA, 1991). In 1990 though, the UAA did seek and obtain recognition from the Council on Postsecondary Accreditation and established the Council on Aviation Accreditation (Council on Aviation Accreditation, 1990). In 1991 the first two accreditation visits were completed and since then six more visits to baccalaureate aviation programs have been accomplished. These eight programs are the only professionally accredited aviation programs in the country.

The implementation of accreditation is the only specific external quality assurance monitor of baccalaureate aviation programs. Presently the offering institutions through their regional accrediting associations are the general monitors of aviation program quality. This researcher did not find any studies in aviation or education journals identifying factors of aviation program quality or specific methods of measuring aviation program quality other than the accreditation standards. This lack of specific baccalaureate aviation program quality criteria gives rise to many questions. These questions include: 1) What are the indicators aviation program administrators should establish in developing a high quality aviation program,

2) How does one know if a baccalaureate aviation program in this country is of high quality, and 3) What criteria should be used to determine a program's

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quality? Although initial accreditation standards have been implemented, the accreditation criteria mainly address input variables (e.g., resources, facilities, faculty) of a baccalaureate aviation program. Little assessment of an aviation program's environment or outcome variables are mentioned. However, the current emphasis in the literature is on the environment of academic programs as well as the outcomes of those programs. It seems appropriate to study all aspects of U.S. baccalaureate aviation programs in a quest to find a comprehensive set of criteria that support a definition or theory of quality within baccalaureate aviation programs.

Research Questions

In an effort to promote higher quality U.S. baccalaureate aviation

programs, one of the study's overall aims is to identify criteria that, as indicators of program quality, support a ranking of the highest quality programs. The first two research questions address this aim. The second aim of the study is addressed by the third research question and will investigate to what extent U.S. baccalaureate aviation programs follow current literature trends and place more emphasis on key environment and outcome variables of academic program quality. The three research questions are:

- 1.) Which U.S. baccalaureate aviation programs are the highest quality programs in the country?
- 2.) What are the indicators of quality among the highest quality U.S. baccalaureate aviation programs?
- 3.) To what extent do the highest quality baccalaureate aviation programs emphasize environment and outcome indicators of quality?

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In the absence of any studies on baccalaureate aviation program quality, an independent measure of quality is administered in this research study to aviation industry and aviation education experts to identify the highest quality baccalaureate aviation programs in the country. Corresponding criteria are also gathered to support the identified high quality programs. This procedure will allow experts to focus on specific criteria they identify as characteristic of the highest quality programs. An example of this type of research was accomplished by Mijares (1988) in another professional baccalaureate program--criminal justice. Through grounded theory research using Glaser and Strauss' (1967) constant comparative analysis, criteria used to support a ranking of programs went beyond a reputational ranking of baccalaureate criminal justice programs. This type of research should benefit baccalaureate aviation programs as well.

Criteria found to support identification of the highest quality baccalaureate aviation programs may include input, environment, and outcomes variables of those programs and not be based on reputation alone. Because of the recent emphasis on assessment, more attention is now being

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placed on what occurs in the academic environment (processes) as well as the outcomes of that academic environment (Cameron, 1991). Further research could use these identified high quality programs and supportive criteria as a basis to compare data obtained from other academic program quality instruments such as Clark's (1983) Educational Testing Service (ETS) instruments that focus on literature-identified key environment and outcome variables of academic

program quality.

Description of U.S. Baccalaureate Aviation Programs

There are 276 postsecondary education institutions in the United States offering non-engineering aviation programs (UAA, 1994). Of these institutions, 70 offer baccalaureate degrees in aviation-related areas involving some form of flight education. The 70 baccalaureate programs are generally located at Carnegie classified comprehensive I and II institutions throughout the country with a few at research universities and private nonsecular colleges. This research will focus on these 70 programs since the other 206 institutions are either associate degree programs or certificate offering programs and are quite diverse in nature. There are also six baccalaureate aviation programs that do not offer any flight education in conjunction with aviation management degrees that are not included in this study. In order to keep the study's context specific, as recommended by Conrad and Pratt (1985), these programs were not included in this study since the study

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focuses on only those academic programs providing flight education as an integral part of the baccalaureate degree.

As stated earlier, most of these 70 baccalaureate aviation programs originated during the last 25 years. Many programs have evolved from college and university flying clubs in conjunction with business schools or business departments. Others received initial funding and expansion dollars from the FAA airway science grant program. These non-competitive grants began shortly after the air traffic controllers' strike in 1981 as a federal government response to the shortage of air traffic controllers. Additional aviation professional areas such as pilots, aircraft maintenance personnel, and aviation managers were also targeted by these grants.

The 70 baccalaureate aviation programs in this study offer degrees in the primary areas of aviation management, air traffic control, professional flight, and aviation maintenance. Some form of professional flight (flight education) is a required part of the curriculum for each of these programs. A typical baccalaureate aviation program has 150-200 majors with approximately 6 full-time faculty members. The average number of graduates per year is about 25-40. Funding for the programs is usually a combination of state appropriated money and student tuition and lab fees for flight and simulator costs. When available, federal airway science grant monies were used for start-up costs,

primarily toward facilities and equipment.

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Some unique characteristics of these baccalaureate aviation programs offering flight education should be addressed. First, the awarding of flight certificates through these baccalaureate aviation programs requires the program be certified biannually by the FAA as a Federal Aviation Regulation (FAR) Part 141 operator. This certification process grants the academic program the authority to administer the FAA-approved academic classroom instruction (ground instruction) and flight instruction as a requirement to issue applicable certificates to pilots enrolled in the program. These certificates, in order of difficulty and flight time requirements, include student pilot, recreational pilot, private pilot, commercial pilot, instrument rated pilot, flight instructor, instrument flight instructor, and airline transport pilot. Depending on the academic program selected by each student, the appropriate certificate(s) are required for the successful completion of that particular academic program. Through these certification requirements, the FAA does exert a unique influence on the academic curricula of baccalaureate aviation programs. However, there are numerous non-flying courses offered by the programs and the FAA does not have any jurisdiction over these courses. Examples would include courses such as aviation safety, air transportation, airline operations, aviation law, and general aviation operations.

Another unique characteristic of baccalaureate aviation programs is that some programs conduct their own flight training and have a substantial

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degree of capital invested in leased or purchased aircraft and flight simulators. Other programs have subcontracted the flight training requirements out to local airport flight training businesses. Regardless of either FAA-approved flight training method, all flight and ground instruction is given by FAA certified flight and ground instructors. Although similar to other professional baccalaureate academic programs such as the extensive clinical laboratory experiences in nursing, baccalaureate aviation programs add a new dimension to higher education academic programs with FAA oversight of the educational environment.

Significance of the Study

Studying quality within a specific context, such as U.S. baccalaureate aviation programs, helps to more specifically define academic program quality

(Conrad & Pratt, 1985). Identifying the highest quality U.S. baccalaureate aviation programs and determining variables that are indicators of program quality within these programs may help to improve not only baccalaureate aviation programs, but other undergraduate professional programs as well. Also, determining whether key environment and outcome variables of program quality are emphasized at the highest quality aviation programs could identify areas of possible concern for aviation program administrators.

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Results of this study may help aviation program administrators and faculty develop higher quality baccalaureate aviation programs by placing more emphasis on identified criteria that are perceived indicators of program quality. Furthermore, the study may help prospective students of baccalaureate aviation programs decide on where to attend college.

Finally, the results of this study should be of benefit to the Council on Aviation Accreditation (CAA) in evaluating the present accreditation standards. If the indicators of quality given by baccalaureate aviation program administrators and aviation industry experts are similar to the current accreditation criteria, then the CAA would be reassured that the present accreditation criteria reflect the thoughts of higher education, the FAA, and aviation industry experts. However, if the indicators of quality are significantly different from the criteria set by the accreditors, the accreditors may be able to use the results of the study to re-evaluate the criteria for accreditation.

Operational Definitions

For this research study, the following operational definitions are used:

Aviation education experts: the administrators of the 70 baccalaureate aviation programs offering flight education within U.S. colleges and universities as identified in Appendix A.

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Aviation industry experts: 89 aviation industry operations/training directors as identified in Appendix B.

Aviation faculty member: a person holding academic rank and employed on a full-time basis.

Aviation program: an academic program resulting in an earned

baccalaureate aviation-related degree from a college or university. The program prepares the student for entry level positions in the air transportation industry including professional pilots, airport administrators, aviation managers, and air traffic controllers.

Aviation student: an undergraduate student in a program of study leading to an aviation-related baccalaureate degree.

Environment variable: characteristics, processes and experiences of the academic program. (e.g., student-faculty interactions, peer support, and faculty research groups.) Two types of environment variables:

- 1) organizational variables--describe structural characteristics of the academic program. (e.g., administrative governance structures, faculty-student ratios, and faculty workloads.)
- 2) educational process variables--academic activities the faculty, students and administrators engage in within the academic program environment. (e.g., classroom activities, advising sessions, and research activities.)

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Indicator of quality: criteria identified in phase one of the research study that supports the ranking of U.S. baccalaureate aviation programs. In phase two the 16 composite indicators of quality (see Appendix C) used in the Education Testing Service's Program Self-Assessment instruments are the indicators of quality.

Input variable: resources used to initiate the collegiate environment. (e.g., students, faculty, and financial support.)

Outcome variable: refers to the "talents" higher education is trying to develop (Astin, 1991) as well as all other results or consequences of the environment. (e.g., alumni satisfaction, student attitudes, and faculty scholarly productivity.)

Professional baccalaureate academic program: those educational processes designed to provide four years of higher education resulting in a bachelor's degree with skills applicable to a particular occupation. For this research, occupations that are included under the term professional are those identified in The Structure of Professionalism by Cullen (1978). This list includes aviation pilots, air traffic controllers, registered nurses, physicians, lawyers, and clergyman.

Program quality: The dependent variable in this study, program quality, warrants special attention in operationalizing its meaning. It will be defined in phase one of the study through a grounded theory approach using Glaser and Strauss' constant comparative analysis. The criteria used by

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aviation industry/aviation education experts to identify the highest quality U.S. baccalaureate aviation programs will define program quality. The frequency a program is listed in the top ten by aviation education and aviation industry experts will establish a ranking of programs and, thus, quantify the dependent variable program quality. In phase two, program quality will be measured through totaling the average mean scores for students, faculty, and alumni on the 16 composite indicators of program quality on the Educational Testing Service's Program Self-Assessment instruments.

Limitations

This study was conducted under the following limitations:

1. Participation in the study was on a voluntary basis considering the aviation programs, aviation education and aviation industry experts, students, faculty and alumni could withdraw from the study at any point, or choose not to participate.

2. Aviation education and aviation industry experts, students, faculty, and alumni may have reacted differently to a questionnaire as opposed to a normal conversational situation.

3. All participants could interpret questions differently based on their past experiences.

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4. Access to surveying subjects was variable based on the aviation program administrator's interpretation of the study's importance to their program.

5. Only senior aviation majors were surveyed in phase two, thus, possibly biasing student opinion toward the students who succeeded in the aviation program and not getting perceptions from those transferring or discontinuing their education.

6. Perceptions of quality could differ among high, medium, and low quality program students, faculty, and alumni.

Overview of Chapters

In order to study quality in a specific context, it is helpful to review how higher education has addressed quality issues in the past. To do so a discussion of the higher education literature as it pertains to American higher education's historical concern for quality will be accomplished in Chapter II. Selected historical examples will be reviewed, from the founding of Harvard to the Higher Education Act of 1965 and its reauthorizations. Additionally, the second chapter addresses the ways the historical concern for quality has encompassed professional academic programs.

Chapter III reviews current literature trends on indicators of quality in American higher education, focusing on the past 25 years. It will show how

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emphasis has shifted from input and organizational indicators of quality to more emphasis on process and outcome indicators of quality.

With the literature review on quality in American higher education as a backdrop, the two-phased research study is addressed in Chapters IV, V, and VI. Chapter IV outlines the specific research design, data collection, and analysis for phase one of the study. The phase one research design, both qualitative and quantitative, gathers information about baccalaureate aviation program quality by surveying aviation education and aviation industry experts.

The phase two research design, data collection, and analysis is addressed in Chapter V. Using information obtained from phase one concerning which aviation programs are the highest quality programs and what criteria forms the basis for this perception of quality, phase two seeks to establish whether the high quality aviation programs identified in phase one follow current literature trends and emphasize important process and outcome variables of program quality in addition to common input variables of program quality.

Finally, Chapter VI summarizes the findings from the two-phased research design and develops a theory of aviation program quality based on the research findings. Conclusions and implications for further research are also discussed. Thus, by researching academic program quality within the specific context of baccalaureate aviation programs, it is hoped the results

will benefit not only those affiliated with these aviation programs, but those affiliated with other professional academic programs as well.

CHAPTER II

THE HISTORICAL CONCERN FOR QUALITY IN AMERICAN HIGHER EDUCATION AND HOW IT ENCOMPASSED PROFESSIONAL ACADEMIC PROGRAMS

Quality is a key education issue today according to recent reports, studies, and polls (Seymour, 1995, 1993; Millard, 1991). Conrad and Blackburn (1985b) state that program quality is perhaps the “single most important issue in higher education” (p. 283). They suggest a variety of social forces have allowed this condition to develop, including fiscal constraint and increased public awareness of higher education. But has program quality always been an important issue in American higher education? Were there periods in American higher education when quality was more of a concern than during other periods? Through a review of the historical literature on American higher education, these questions are addressed. Although a complete review is not within the bounds of the dissertation, major events that appear to have influenced higher education’s concern for quality are discussed.

Oxford and Cambridge as Models

According to Conrad and Blackburn (1985b), “program quality in American higher education--what it is, how to identify it, and how to foster it--has been an enduring concern among educators since the founding of Harvard College in 1636” (p. 2). Quality in early American colleges was seen as strict adherence to traditions and policies similar to England’s Oxford and Cambridge (Brubacher & Rudy, 1976; Rudolph, 1977). Brubacher and Rudy (1976) explain that early founders of colonial colleges eyed Oxford and Cambridge as models for new colleges. “Harvard followed English college precedents as closely and faithfully

as she could; and Harvard, in turn, became the great prototype for all the later colleges of English America” (Brubacher & Rudy, 1976, p. 3). Thus, the first higher education institutions in America were developed using characteristics from English universities such as Oxford and Cambridge. Since Oxford and Cambridge were the models, and given the fact that they were considered top universities in England (Rudolph, 1977), (even though this may have been based on reputation alone), one can infer that quality was a prime requisite for new colonial colleges.

The desire to model the American colleges after Oxford and Cambridge continued well into the nineteenth century. Although the Yale Report of 1828 resisted changing the curriculum to more modern languages and natural sciences, it was in essence a plea for quality by calling for the

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maintenance of the traditional classic college course still being taught at Oxford and Cambridge (Rudolph, 1977). Although the aims of higher education were different from today, a concern for quality was reflected in the strong desire to uphold the colonial educational values that were modeled after Oxford and Cambridge.

Implementing Admission Standards

Early American higher education concern for institutional quality is seen in the introduction and enforcement of admission standards. Harvard’s admission standards in the mid-seventeenth century required all students to have a knowledge of Latin and Greek (Brubacher & Rudy, 1976). Other colonial colleges maintained these same admission requirements into the eighteenth century (Rudolph, 1977). These requirements “presupposed a really high order of linguistic ability” (Brubacher & Rudy, 1976, p. 12). In order to enter college, prospective students studied under a minister to gain the required Latin and Greek literacy (Brubacher & Rudy, 1976).

The Morrill Land Grant Act of 1862

Although the impact of the Morrill Act of 1862 would not be felt until later in the nineteenth century, it provided the impetus for changing how academic program quality was viewed (Veysey, 1965). The Morrill Act of 1862 was the “key element” in bringing about the growth of applied

subjects mixed with pure subjects (Cheit, 1975). This became one of the special characteristics of higher education in America (Cheit, 1975; Moos, 1981). In addition to opening the curriculum to modern languages and natural sciences, it also developed agricultural and mechanical arts (Rudolph, 1977).

The significance of this major event in the history of American higher education included the fact that it initiated the practice of using grant money to achieve the federal government's desired educational objectives (Brubacher & Rudy, 1976). The act also introduced the principle of equal opportunity, a concept that was to become common for subsequent federal legislation concerning education in the twentieth century (Brubacher & Rudy, 1976). For the first time in American higher education history, the federal government was taking action to ensure that higher education would continue to meet changing societal needs and thus maintain quality (Rudolph, 1977).

The Emergence of the Elective System

The latter part of the nineteenth century brought about additional changes in American higher education. "No academic tool was more helpful in allowing an institution to do almost everything and anything than was the elective system with which Eliot of Harvard in 1869 had announced his intention to transform Harvard" (Rudolph, 1977, p. 191). The historical

aspects of how the elective system emerged shows that higher education, as well as society, was concerned about quality academic programs. The traditionalist felt that quality was being eroded with the influx of elective courses (Brubacher, 1978; Veblen, 1957); whereas the progressivists thought that implementing the elective system would improve higher education by meeting more of society's needs (Veysey, 1965). For undergraduates, the elective system was an invitation to both wider and more specialized learning opportunities, responsive to individual interests and skills (Rudolph, 1977).

The elective system spread to most American colleges and universities. Society wanted American higher education to be more responsive to the industrial revolution and the subsequent knowledge explosion (Rudolph, 1977; Veysey, 1965). Thus, the concern for quality continued during this era through the implementation of the elective system.

Accreditation

Princeton University President Woodrow Wilson addressed the Middle States Association of Colleges and Schools in 1907:

We are on the eve of a period of reconstruction. We are on the eve of a period when we are going to set up standards. We are on the eve of a period of synthesis, when, tired of this dispersion and standardless analysis, we are going to put things

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together into something like a connected and thought-out scheme of endeavor. It is inevitable. (Young, Chambers, Kells & Associates, 1983, pp. 4-5)

After the passage of the Land-Grant College Acts of 1862 and 1890, rapid change was taking place throughout American higher education. Enrollments were increasing and many new colleges and universities were being established such as Johns Hopkins University, the first “real American university” (Young et al., 1983, p. 6). The reason accreditation is linked to a concern for quality is because its emergence “shared the characteristics of the society that spawned it: idealistic, self-motivated, reform-minded, desiring improvement, believing in both individual initiative and voluntary collective action, and distrustful government (though seeing government as embodying the ultimate power to right wrongs)” (Young et al., pp. 5-6). The desire for improvement on the part of the institutions, and the establishment of the self-study process for the purpose of evaluating whether the institution was accomplishing its purposes, showed proof of a continuing concern for academic program quality in the early twentieth century.

The first accreditation standards were established by the North Central Association of Colleges and Secondary Schools. The association was committed to a voluntary, nongovernmental process of self regulation with the primary emphasis on evaluating and improving educational quality. “The genius of accreditation is that it began with the impossible task of defining

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education quality and in just twenty-five years evolved, by trial and error, into a process that advances educational quality” (Young et al., 1983, p. 13). Educational quality started to be evaluated and encouraged by looking at conditions (input, resources, and process) that were believed to be necessary and desirable to produce educational quality. Additionally, through accreditation, attention was given to evidence that showed an institution or program achieved educational quality (outcomes).

Federal Legislation

The Servicemen’s Readjustment Act of 1944 allowed for a significant increase in higher education enrollments, as well as expanded recognition of the range and types of students who could benefit from higher education (Millard, 1991). This act was initiated to improve higher education’s responsiveness to the needs of society. What was valued as quality in academic programs was changing to include a much larger student population. Society’s values were changing toward the realization that a greater percentage of America’s population could gain from going to college (Gardner, 1961). The 1952 Servicemen’s Readjustment Act also exhibited a concern for academic program quality because it required veterans funded by the Veteran’s Administration to attend only those colleges and universities that were accredited by a regional accrediting agency. A great deal of

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importance had been placed on the accreditation process to help ensure quality academic programs.

The National Defense Education Act of 1958 can also be linked to American society’s concern for quality. The act, along with the launching of Sputnik in 1957, “brought about an increased emphasis on science and technology, and university research to support technological supremacy” (Millard, 1991, p. 30). This was the beginning of a new era in higher education. Although the U.S. Constitution delegates responsibility of higher education to the states, since 1958 the federal government has served a major role in providing direction and defining parameters for the development of higher education (Millard, 1991). The Higher Education Act of 1965 and subsequent amendments and reauthorizations also targeted specific concerns for quality in higher education such as minority student enrollments, vocational education, and diversity (Newman, 1987).

Historians such as Rudolph, Brubacher, Rudy, and Veysey have recorded an ongoing concern for the quality of academic programs throughout American higher education history since the founding of Harvard in 1636. The values defining quality have changed significantly, from the desire to maintain traditional classical languages curriculum of Latin and Greek to today's concerns over affirmative action. Whether it was Eliot's crusade to reform Harvard's curriculum through the elective system (Rudolph, 1977) or Harvard's desire to use Oxford and Cambridge as models

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(Brubacher & Rudy, 1976), the historical literature shows a concern for quality was clearly evident in American higher education.

But was professional education included in this concern for quality? Or were professional education programs thought of as a hinderance to quality in American higher education? Next, the literature review investigates how professional academic programs were for the most part, encompassed within higher education's historical concern for quality.

Ways the Historical Concern for Quality Encompassed Professional Academic Programs

Before discussing the ways higher education's concern for quality encompassed professional programs, it is necessary to elaborate on how "professional" is defined in the literature. According to Schein (1972), the problem of defining profession or professional "derives from our attempt to give precision to a social or occupational role that varies as a function of the setting within which it is performed, that is itself evolving, and that is perceived differently by different segments of society" (p. 8). However, sociologists have agreed on the necessity for using a multiple criteria definition of professional (Schein, 1972). According to Schein (1972), a professional:

- 1) is employed in a full-time occupation;
- 2) has a strong motivation or calling;

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- 3) acquired a specialized body of knowledge and skills during a prolonged period of education and training;
- 4) makes decisions on behalf of a client in terms of general principles, theories, or propositions;

- 5) is service orientated;
- 6) bases service to client on objective needs of the client;
- 7) demands autonomy of judgment of his or her own performance;
- 8) maintains membership in associations that define criteria of admission, educational standards, licensing or other formal entry examinations, and areas of jurisdiction for the profession;
- 9) has knowledge assumed to be specific;
- 10) is ordinarily not allowed to advertise or to seek out clients.

Moore and Rosenblum (1970) proposed arranging the above criteria in a particular order so that one could judge an occupation in terms of its degree of professionalism. He suggests an ordering of the preceding criteria, particularly numbers 1, 2, 8, 3, 5 and 7, to arrive at whether an occupation is a profession.

Schein (1972) reports that the main criterion of professionalism according to most sociologists is the achievement of autonomy. This implies (1) knowing what is good for the client better than anyone else because of extended technical education or training; (2) subjecting one's decisions only to the review of colleagues; and (3) setting all of one's standards pertaining

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to jurisdiction of the profession and entry into it through peer-group associations.

It can be argued that aviation, the employment-specific occupation chosen as the focus of this research, meets the requirements for a profession (Cullen, 1978). Although the aviation profession is relatively new, a look at how American higher education encompassed emerging professions in the past may be helpful in providing for the advancement of all professional academic programs today. Within this contextual definition of a professional, one can proceed in examining how the historical concern for quality encompassed professional academic programs.

Early Professional Education' Concerns

The historical concern for quality in American higher education and how it encompassed professional education mainly addresses those professional

programs that are graduate programs today. Most of the literature on early American higher education addressed how the professional academic programs of law, ministry, and medicine were encompassed within higher education, because those were the only professional education programs offered at the time (Brubacher & Rudy, 1976). These programs were four-year baccalaureate programs well into the nineteenth century

¹ the term professional education and professional academic programs are used interchangeably and are intended to identify academic programs that are professional in nature.

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(Veysey, 1965). It was not until the later part of the nineteenth century that the professional baccalaureate programs prevalent today started to emerge (Bledstein, 1976). Thus, the concern for quality encompassing professional baccalaureate education prior to the later part of the nineteenth century includes only law, medicine, and the ministry.

The quality of education for the traditional professions of ministry, medicine, and law has been examined since the beginning of American higher education. Ever since Harvard's President Dunster sought to obtain law and medicine books in the mid-seventeenth century, American higher education has been interested in quality professional academic programs (Brubacher & Rudy, 1976).

The literature does show times when higher education felt that professional education should not be a part of higher learning. For instance, Kadish (1991) reports that historically the law and medicine professions were first entered largely through apprenticeship. Not until the nineteenth century did formal schools exist to any great extent. During the late nineteenth century, these schools were raised to university grade (Kadish, 1991). But the idea that vocational training is a modern diversion, that in earlier days students came to colleges to get a liberal education rather than to prepare for a job, seems to have little foundation in fact (Millard, 1991). "The early colleges on the whole were established to prepare students primarily for the ministry and law, and the classical curriculum was seen as

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the best way to do so" (Millard, 1991, p. 24). Thus, even though professionals were trained through a liberal arts curriculum, professional education was seen as a very important part of an early American college or university, especially for the preparation of ministry students.

Other examples of the concern for quality encompassing professional education took place. In spite of the faculty report of 1828 resisting curriculum changes, Yale added a professorship in chemistry and animal and vegetable physiology in 1846 (Cheit, 1975). King's College (later Columbia) introduced agriculture as a part of the curriculum as early as 1754. Cheit (1975) explains that students during the mid-nineteenth century were no less concerned with their future careers than they are today. As a result, the American higher education system adapted academic programs to meet societal concerns for quality and practicality (Bledstein, 1976; Rudolph, 1977).

Critics of Professional Education

Historians document considerable resistance to professional education within American colleges and universities (Brubacher, 1978). Veblen (1957) described vocational training as "training for proficiency in some gainful occupation, and it has no connection with higher learning, beyond that juxtaposition given it by the inclusion of vocational schools in the same corporation with the university" (p. 140). Veblen (1957) felt the elective

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system initiated the significant increase in professional education at the university level, to his dismay. His criticism may have been grounded in the fact that the most dangerous, potential rival to the early American university was the professional school because it drew from the same pool of students (Collins, 1979). Other scholars like Whitehead (1929) were more optimistic that higher education would graciously encompass professional education.

Changing Societal Needs

In the 1870s, entrepreneurs led a reform, shifting from the classical college to the modern university (Collins, 1979). This modern university led to the development of many professional schools, including law, medicine, and business. Kadish (1991) postulates that "in substantial measure, the waning importance of formal apprenticeship and the use of professional education at universities surely reflects a continuously complicated technology, and the requirements for professional activity in a complicated society" (p. 111). American higher education was responding to the needs of society (Rudolph, 1977) and as a result, it can be argued, was concerned about maintaining quality

(Bledstein, 1976; Burke, 1982; Moore, Damewood, Floyd & Jewell, 1984).

Professional education at the university level seemed like an appropriate direction for higher education, especially since the pressures from society were intense (Bledstein, 1976). Burke (1982) explained that

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critic after critic complained about the lack of vocational and technical training in the inflexible colleges during the early to mid-nineteenth century. Although change came slowly due to the denominational control of the colleges, eventually the professional elite (e.g., doctors, lawyers, businessmen, and academicians not governed by the church) gained control of the colleges and universities (Hofstadter & Hardy, 1952). These new leaders were able to implement more professional education programs and thus improve quality in respect to society's changing values.

The Morrill Act of 1862--Its Effect on Professional Education

After the mid-nineteenth century, educators began to show some signs of discontent with the quality of academic life (Bledstein, 1976). This discontent led to the passage of the first Morrill Act, one of the key events in the history of American higher education that made significant improvements in professional education (Cheit, 1972).

In 1866, Cornell's President Andrew White spelled out his conviction that undergraduate education should be both special and general and that special--or professional--education not be subordinated to any other (Rudolph, 1977). "White's scheme for Cornell, a readiness to extend formal training and professional recognition to such old occupations as farming, engineering, and business was accompanied by a desire to remedy the failure of the colleges to provide a general education of a nature that the

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public would support" (Rudolph, 1977, p. 118). The land grant act provided the support for this change in philosophy and Ezra Cornell and White were two of the pioneers who envisioned a significant increase in professional education within America's colleges and universities. Cornell University was the first new institution of higher education in America since the founding of Harvard College to succeed in becoming a model for other institutions, and a far-reaching influence on the curriculum (Rudolph, 1977).

Accreditation and Professional Education Quality

Professional education has also been encompassed within American higher education's concern for quality through the establishment of specialized accrediting bodies such as the American Assembly of Collegiate Schools of Business and The National League for Nursing (Young, et al., 1983). The forerunner of these specialized accrediting bodies was the American Medical Association which in 1902 set up standards for medical schools. The 1910 Flexner Report severely criticized the quality of medical education in this country, resulting in the closing of almost one-half of America's medical schools (Burrage & Torstendahl, 1990; Cheit, 1972). In reviewing the historical aspects of the implementation of accreditation in professional academic programs such as aviation, dietetics and nursing, a similar concern for quality can be noted (American Dietetic Association,

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1991; Council on Aviation Accreditation, 1990; Gillham, 1986; National League for Nursing, 1990; Werthaus & Fauser, 1991).

In 1928, the American Dietetics Association established new educational requirements that included the baccalaureate degree with a major in foods and nutrition and at least six months' training in a hospital under the supervision of a dietitian (American Dietetics Association, 1991). After setting up these minimum requirements for dietitians, the need for evaluating the quality of dietetic programs became evident. Thus, the American Dietetic Association established visitation teams to evaluate each educational site to ensure quality academic programs were maintained. This eventually led to the development of specialized accreditation for dietetics programs through the Council on Postsecondary Accreditation.

Nursing education also has a relatively long history of developing and improving standards for quality nursing education since the 1920s and 1930s (National League for Nursing, 1990, 1991). Accrediting activities were conducted by a number of nursing education organizations until the early 1950s, when all accreditation was consolidated with the National League for Nursing.

The University Aviation Association is in the initial stages of accrediting its baccalaureate academic programs. After being recognized by the Council on Postsecondary Accreditation in 1990 as a specialized accrediting body, the Council on Aviation Accreditation is also addressing

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quality issues through its newly developed accreditation criteria (Council on Aviation Accreditation, 1990).

These are just three examples of the accreditation process encompassing professional baccalaureate education in order to improve academic program quality. Accreditation proponents would agree many others exist. Thus, quality, not only in liberal education, but also in professional education, was given renewed attention through institutional and specialized accreditation.

Federal Legislation's Effect on Professional Education Quality

The two pieces of fairly recent federal legislation having significant impact on quality in professional education were the National Defense Act of 1958 and the Higher Education amendments of 1972. The National Defense Act of 1958 provided significant financial support to advance America's space technology through higher education's engineering schools (Millard, 1991). The 1972 Higher Education Act amendments embraced all postsecondary education as eligible for federal support, including most vocational, occupational, and professional programs (Newman, 1987) including aviation. The quality of professional programs was enhanced because of renewed interest by society, and the additional federal support (Newman, 1987).

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Thus, the literature shows that the concern for quality in professional education has run parallel to society's desire for quality in all of American higher education academic programs. Through federal legislation, specialized and institutional accreditation, and society's interest in the useful arts, American higher education had extended its search for quality to professional education.

With this investigation of the historical concerns for quality in higher education and professional academic programs as a backdrop, current research emphases on indicators of quality will be addressed in Chapter III. While research on quality indicators began in the early twentieth century with Hughes and Cattell's work (Webster, 1983), research studies conducted during the past twenty-five years will be the focus of discussion.

CHAPTER III

CURRENT LITERATURE TRENDS ON INDICATORS OF QUALITY

IN AMERICAN HIGHER EDUCATION

The purpose of this portion of the literature review is to examine higher education literature to determine the extent current emphasis has shifted from input and organizational indicators of quality to educational process and outcome indicators of quality to describe the learning environment. The quality-context literature generally falls into three categories. The first category will address indicators of quality in graduate programs since more studies initially were focused on those programs. Studies addressing input, organizational, educational process, and outcome variables will be discussed.

The second category will focus on research studies of baccalaureate academic program quality. Nonprofessional and professional academic programs will be the emphasis with input, organizational, educational process, and outcome variables the subcategories. The third category contains general literature reviews on academic program quality. By subdividing the literature into these three areas, comparisons of how quality is viewed and measured across different types of programs can more readily be made.

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Indicators of Quality in Graduate Academic Programs

Although this research focuses on quality in professional baccalaureate aviation programs, there is a considerable amount of pertinent literature on graduate academic program quality. Even though this literature reveals a greater emphasis on scholarly and research activity than might be appropriate for baccalaureate programs, basic characteristics of quality academic programs can be gleaned from the numerous articles that have dealt with the topic of quality in graduate academic programs.

Graduate Program Reputational Studies

Many of the research studies concerning quality in graduate programs placed a great deal of emphasis on reputational ratings (Astin, 1985). A possible reason for this is that graduate programs are often what determines institutional prestige (Fairweather, 1988). For example, the American Council on Education's 1966 Cartter ratings of quality graduate programs and the 1970 Roose and Anderson ratings were based on graduate program reputation as viewed by faculty (Clark, 1983). Many research studies have used these reputational ratings

as the measure of the dependent variable program quality (Gregg and Sims, 1972; Hagstrom, 1971; King and Wolfle, 1987; Saunier, 1985; Webster, 1986). Although strong arguments can be made for basing quality on reputation (Cartter, 1966), doing so may be

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biased, since reputation is not a direct measure of quality (Fairweather, 1988; Lawrence and Green, 1980; Tan, 1986).

Graduate Program Input and Organizational Variables

Conrad and Blackburn (1985a) conducted a study of five departments, biology, chemistry, education, history and mathematics, at 22 public 4-year institutions. They measured departmental quality at the graduate level by studying 73 independent variables that were classified into five major categories of input and organizational indicators of program quality. These categories were faculty, students, program, facilities, and support. Instead of using reputational peer ratings for gauging department quality (the method used in most previous studies), this study used comprehensive reports by peer reviewers similar to an expert evaluation method (Worthen & Sanders, 1987). The study appears to hold more validity than past reputational studies since it was broader in its approach to what may affect quality. The following variables correlated with departmental quality (Conrad & Blackburn, 1985a):

- 1) individual and combined measure of faculty (scholarly productivity, grantsmanship, age and tenure status, geographical origin of highest degree, and teaching workload);
- 2) students--ability and a necessary enrollment ("critical mass");
- 3) program--curricular concentration and high proportion of institutional degree programs at the advanced graduate level;
- 4) facilities--library size

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Although the researchers did not collect any student outcome measures, the findings suggested that "factors associated with graduate departmental quality are more multidimensional in regional colleges and universities than in highly ranked research universities" (Conrad & Blackburn, 1985a, p. 279). In past studies using research universities, only a few variables were found to account

for a large amount of the variation in program quality. However, Conrad and Blackburn postulated that numerous variables at the program and institutional level account for program quality.

A study by Fairweather and Brown (1991) on dimensions of academic program quality in graduate programs focused on five markers of academic quality as a result of a review of the literature. These five characteristics are similar to Conrad and Blackburn's (1985a) five characteristics except Conrad and Blackburn's review included breadth and depth of curriculum while Fairweather and Brown's review included overall prestige. Prestige was measured by the Carnegie Commission classification as a research university, if the academic program was accredited, and whether it was included in a National Academy of Science (NAS) study (Jones, Lindzey, & Coggeshall, 1982). The five characteristics, mostly input and organizational indicators of quality, were faculty quality, student quality, size, resources,

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and overall prestige (Fairweather & Brown, 1991). A different measure of faculty quality was used by computing 1) number of faculty with a Ph.D., 2) NAS rating of overall faculty quality, 3) NAS rating by faculty reputation, and 4) total research funds awarded.

The purpose of Fairweather and Brown's research was to "assist administrators by identifying empirically the underlying structure of academic program quality, with the goal of determining the accuracy of four competing perspectives on quality" (Fairweather & Brown, 1991, p. 159). These four perspectives on quality are (p. 159):

Perspective 1: Academic program quality is best understood as a set of discrete dimensions independently measuring faculty quality, student quality, size, resources, and overall prestige.

Perspective 2: Academic program quality is best understood by its hierarchical level (institution, college, or program level). These levels include several measures of quality; but irrespective of such internal differences as faculty size, number of students, etc., measures of program quality should cluster or automatically group separately by institution, college, or program level. For example, faculty quality may be a quality indicator at the program level but not at the college or institution level.

Perspective 3: Academic program quality is best understood as a combination of dimensional and hierarchical levels (Perspectives 1 &

2 combined); that is, dimensions of quality are nested within hierarchical levels. Measures of quality should cluster into such components as resources within the institutional level, resources within the college level and resources within the program level.

Perspective 4: Irrespective of whether measures of academic quality cluster by dimension, hierarchical level, or a combination of the two, academic program quality is best understood only program by program (Jones, Lindzey, & Coggeshall, 1982). The quality indicators for each program should cluster separately from the measures for another program.

Perspective number four supports Conrad and Pratt's (1985) position of defining quality within a specific context and forms the basis for determining indicators of quality academic programs within specific professional education settings. The research design used in this study of baccalaureate aviation programs is an example of this perspective on quality. However, through an examination and analysis of data from three graduate programs, the results of Fairweather and Brown's study "strongly supported perspective 3, which hypothesized that indicators should cluster by dimension within hierarchical levels" (Fairweather & Brown, 1991, p. 172). The results supported previous research (Conrad & Blackburn, 1985a) claiming that program quality is best viewed as having multiple indicators of quality and the indicators could be at the program level, college level, or

institutional level. Findings supported the fact that size, resources, and accreditation are best examined at the program level.

Graduate Program Educational Process and Outcome Variables

One study of quality indicators in graduate programs did focus more on environment and outcome indicators of quality. An extensive research project was conducted from 1973 to 1979 to create a measurement instrument to determine quality in U.S. graduate programs (Clark, 1983). The combined efforts of the Council of Graduate Schools, the GRE Board, and Educational Testing Service produced quantitative measurement instruments of graduate program quality by receiving input from a 60-member panel of graduate deans. The resulting questionnaires for students, faculty, and alumni, focused on 16 program

characteristics judged important to quality (Clark, Hartnett, & Baird, 1976). The questionnaires give special attention to indicators of environment and outcome variables of academic program quality, rather than inputs and reputation (Clark, 1983). The product of the study, a self-assessment instrument determining academic program quality, is administered by the Educational Testing Service (ETS). The research design in this study uses this ETS instrument in phase two. (See Appendix C for explanation of the 16 quality characteristics addressed by the instrument.)

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Indicators of Quality in Baccalaureate Academic Programs Nonprofessional Baccalaureate Academic Programs

Although most research studies on nonprofessional baccalaureate program quality were reputational (Webster, 1986), one study did use mainly input and organizational indicators of quality, as well as some educational process indicators of quality. In this study of baccalaureate program quality, Solmon and Astin (1981) found size, prestige, selectivity, per student financial expenditures, and institutional curricular concentration to be the correlates of professional program quality in baccalaureate programs. Quality was defined by Solmon and Astin (1981) through the following six criteria: commitment to teaching, innovativeness of curriculum, preparation of students for employment, preparation of students for graduate or professional school, scholarly excellence of faculty, and overall quality rating. The results of this study were based on a four-state survey of faculty from six baccalaureate fields--history, economics, English, chemistry, sociology, and biology. In the survey, approximately 15,000 faculty chose top baccalaureate academic programs from a list of institutions. Raters primarily used two criteria in judging academic program quality: scholarly excellence of faculty and commitment to undergraduate teaching (Solmon & Astin, 1981). Commitment to undergraduate teaching was derived from two criteria: faculty commitment to teaching and innovations of curriculum and pedagogy.

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Professional Baccalaureate Academic Programs

A conceptual framework developed by Stark, Lowther, Hagerty & Orczyk (1986) helps provide a basis for understanding quality in professional baccalaureate education. Improved understanding of quality is essential for effective administration in today's higher education environment when university program review and retrenchment parallel traditional efforts to increase

educational quality and interdisciplinary collaboration (Stark et al., 1986). Through the use of this framework, indicators of quality professional academic programs can be identified.

The three influence categories of the framework (internal, intraorganizational, and external) affect the professional preparation environment (Stark et al., 1986). This environment is similar to an organization's culture, although it is more inclusive (Stark et al., 1986). It serves as "a mediating variable between the influences and the educational processes" (Stark et al., 1986, p. 236). It is expected that an examination of the professional preparation environment will result in the discovery of indicators of quality in professional academic programs.

At the educational processes level of Stark's et al. (1986) framework plans are designed and implemented in order to accomplish the goals of a professional academic program. Educational processes translate the norms, values, and issues of the professional preparation environment into actual

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student education (Stark et al., 1986). Looking at this level may also be very important in identifying indicators of quality.

The third level of the framework is the professional preparation outcomes level. Past researchers envisioned the outcomes of professional education to include "the acquisition of knowledge, technical and occupational culture, the rewards and sacrifices, the ethical rights and duties, the development of various types of professional careers, and the degree and kind of commitment to the way of life of the professional" (Stark et al., 1986, p. 243). Measuring these outcomes of professional education can be a difficult task. But through identification of the goals of a professional baccalaureate academic program, the accomplishment of these goals may lend credence to rating an academic program's degree of quality.

Input and Organizational Variables of Professional Baccalaureate Programs
Accreditation in professional baccalaureate programs. A review of the

literature on identifying indicators of quality professional baccalaureate programs points to the topic of accreditation. Accreditation is just one of the external influences which affect professional academic programs. Many professional baccalaureate programs have specialized accrediting bodies which accredit new and existing programs. For example, nursing programs have had an accrediting body since the first part of the twentieth century (National League for Nursing,

1990), whereas aviation's accrediting body began in 1990 (Council on Aviation Accreditation, 1990). Although

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accreditation does not determine institutional or program quality (Millard, 1983), it has a "crucial role in determining whether an institution or program has accepted and is carrying out its commitment to quality" (p. 9). To say a program is of high quality if it is accredited may not be true. But accreditation, as a condition of a program, is "a status granted to an educational institution or program that has been found by its peers, including professional representatives, to meet stated criteria bearing on educational quality and accomplishment" (Millard, 1983, p. 9).

The criteria used in accreditation standards of professional baccalaureate programs include characteristics which help to establish and maintain quality programs (Werthaus & Fauser, 1991). These criteria have been compiled by experts in a particular field and have been accepted by the profession. Thus they form a basis for defining minimum standards of quality in each academic program (Council on Aviation Accreditation, 1990; National League for Nursing, 1991). However, although these standards appear necessary, a question asked today, especially with increased emphasis on assessment, is whether these standards are sufficient for establishing and maintaining quality?

Comparing professional accreditation standards. Hagerty and Stark (1989) compared educational accreditation standards across ten professional fields. These disciplines were architecture, business administration, education, engineering, journalism, law, library science, nursing, pharmacy,

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and social work. The authors state (p. 1) "despite the continuing discussion about the merits of specialized accreditation, little evidence has been gathered about the relationship between accreditation standards and educational excellence in professional education programs." Finding links to program quality that are common among different professional fields through an examination of their accreditation standards formed part of the rationale for their study. They found that professional accreditation standards tended to emphasize mission and goals, faculty, students, curriculum, governance, resources and facilities,

evaluation, and outcomes.

Educational Process and Outcome Variables of Professional Baccalaureate Programs

Identifying desired educational outcomes. Professions can have different perceptions and expectations of quality. But when one looks at outcome measures, more consistency is seen across the professions (Stark et al., 1986). Through Stark's work, a list of educational outcomes of professional undergraduate programs was compiled that portrays the general desired learning outcomes of these programs. These outcomes are either a desired professional competency or desired professional attitude. The desired professional competencies include conceptual, technical, integrative, contextual, adaptive, and interpersonal communication competencies. The desired professional attitudes are professional identity, professional ethics, career marketability, scholarly concern for improvement, and motivation for

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continued learning. It would seem to follow that quality professional baccalaureate academic programs would place significant emphasis on attaining these outcomes.

Additional work by Stark and Lowther (1989), with a group of faculty from professional and liberal arts fields, added the desired outcomes of leadership ability, critical thinking, and aesthetic sensibility. Although the purposes of the Hagerty and Stark study may not have included identifying indicators of quality in undergraduate programs, the study does place emphasis on minimum accreditation criteria across professional fields. The emphasis on these minimum standards, set by recognized experts in each professional field, allows researchers to focus on accreditation criteria considered essential for a minimum level of quality within each professional baccalaureate program. Thus, examining desired educational outcomes may identify educational process and outcome indicators of quality in baccalaureate aviation programs.

Focusing on assessment and accreditation. Dinham and Evans (1991) researched assessment and accreditation in professional schools. The authors examined "the common claim that professional accreditation processes respond adequately to today's concerns for the systematic assessment of undergraduate education" (p. 218). This study consisted of identifying distinguishing characteristics of professional programs, as well as studying six professional fields at a large public university in regard to

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specific program assessment characteristics to improve educational quality. The results of the study partly focused on how assessment can be used effectively to improve professional baccalaureate academic program quality. Results from Dinham and Evans' (1991) study identified the following two areas as needing emphasize in the assessment of professional baccalaureate academic programs (p. 233):

1. Comprehensive assessment envisions undergraduate education that includes both general and specialized knowledge, that instructs in both general studies (including intellectual skills and habits) and professional competence, and that concerns student development beyond the academic realm, and
2. It should include these essential elements: it should use existing assessment mechanisms, systematically and comprehensively, be intended to improve teaching and learning, and focus on the institutional environment's effects on learning and development.

Professional baccalaureate academic programs that focus on these important concerns, would, by consensus of these researchers, be exhibiting characteristics of quality programs. Criteria used by the researchers included admissions data, student outcomes, elements of the institutional environment (i.e., teaching effectiveness, student interaction), and components of the undergraduate curriculum including the extracurriculum.

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Dinham and Evans (1991) define quality as primarily a process within the academic environment.

Dinham and Evans (1991) also offer the following six recommendations for improving quality through assessment in professional schools (p. 234):

1. Programs should avoid common standardized tests of general studies and focus upon general education as it is manifest in professional competence;
2. Programs should engage in intensive collaboration between professional and liberal arts faculty;
3. Programs should continue research on the schools' educational efforts to link entry characteristics with professional competencies and to link professional instructional studies programs more directly to

professional competencies;

4. Programs should do more research on the personal, general, and professional competencies of graduates;
5. Programs should consider altering current accreditation practices to make them more useful as analytic tools for strengthening professional programs; and
6. Programs should take the “higher road,” the more comprehensive, more difficult, but potentially more rewarding approach to assessment to improve academic program quality.

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By understanding professional baccalaureate education, an assessment model or strategy can be formulated that will identify indicators of quality in professional baccalaureate academic programs. A model was developed by Conrad (1987) that “attempts to link student characteristics, elements of college environment, and student outcomes” (Dinham & Evans, 1991, p. 223).

Conrad’s model identifies similar characteristics as the Stark’s et al. (1986) framework for studying professional programs. For example, Conrad’s elements of institutional environment section covers items in Stark’s internal influences section. Furthermore, Conrad’s outcome category is similar to Stark’s desired outcomes section. The identification of characteristics exhibited in both Stark’s framework and Conrad’s model lend theoretical support to identifying indicators of quality in professional baccalaureate academic programs.

Synthesis of Past Literature Reviews

Input and organizational variables. In a review and critique of literature and research concerning program quality in higher education, Conrad and Blackburn (1985b) advanced the argument that academic quality “in this country has multiple dimensions and can be seen in many contexts” (p. 285). Most scholars agree that quality is not likely to be the same at different types of academic institutions (Astin, 1985; Conrad & Wilson, 1985; Millard, 1991). High quality programs in research universities as

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compared to high quality programs in community colleges will have different attributes. However, after synthesizing the literature, Conrad and Blackburn (1985b, p. 285) give the following elements commonly found in quality academic

programs:

- 1) Faculty: quality programs are almost always related to characteristics of the faculty responsible for the implementation of the curriculum;
- 2) Facilities: quality programs have facilities necessary for their success such as well-equipped laboratories, appropriate library holdings, computers, and all the material things needed for the desired learning to take place;
- 3) Finances: quality programs have adequate financial support including the resources to maintain the operation, provide for faculty travel, and attract and retain outstanding faculty;
- 4) Curriculum: quality programs have a curriculum which has sufficient breadth and depth of courses; and
- 5) Students: quality programs have a sufficient number of students to provide for an adequate mix to foster students' learning from one another, and yet not so many students that individualized attention is lost.

Kuh's (1981) extensive literature review used Stufflebeam's context-input-process-product model (Stufflebeam et al., 1971) to identify

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indices of quality in undergraduate programs. Major indicators of quality in the first two segments of Stufflebeam's model dealt with input and organizational indicators of quality. These were as follows (Kuh, 1981, p.

10-26):

A.

Context Indicators of quality

1. **Size** .adequate number of undergraduate students
2. Clarity and consistency of institutional purpose
3. Organizational processes
 - a. decision-making strategies
 - b. grading practices
 - c. informal systemic properties

- (1) faculty norms (2) morale
- 4. Financial resources
 - a. salaries
 - b. library collections
- 5. Student living environments
- B. Input Indicators of Quality
 - 1. Student ability
 - 2. Biographical characteristics of students
 - 3. Nonintellectual characteristics
 - a. aspirations
 - 54
 - b. interests

According to Kuh's review of research studies conducted during the 1960s and 1970s on quality, four of the above context indices (A1, A2, A3, and A5) seem especially useful in estimating quality because they were found to correlate with program quality in more than one study. For the most part, Kuh (1981) found program quality was measured "through applicable surrogate indicators of institutional quality rather than students' manifestations of quality" (p. 12). Kuh (1981) further states that in general, the above input indices have not been particularly useful in predicting quality in past studies. However, today these indicators may play more of a part as quality indicators due to increased emphasis on diversity.

Educational process and outcome variables. Academic programs having all of these organizational indicators of quality may not be deemed of high quality after assessing educational process or outcome variables as indicators of quality. Conrad and Blackburn (1985b) identified other correlates of program quality that are educational process or outcome variables. These correlates are less quantifiable, and include "leadership of program administrators, esprit of students and faculty, morale of students and faculty, clarity of purpose, and a healthy organizational climate" (p. 286). Esprit was described as a cooperative attitude among students as well as among faculty, whereas morale was more of an

individual student and faculty trait. Although studies listing these characteristics as quality

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program indicators were sparse (Kuh, 1981), they still may play a part in developing and maintaining a quality academic program.

Additional characteristics associated with program quality are exhibited through the personal actions of students, faculty, and administrators. Examples include “achievement, persistence, purpose, worth, beauty, meritoriousness, and character” (Conrad & Blackburn, 1985b, p. 286). Other ingredients of quality academic programs discussed by Conrad and Blackburn’s (1985b) literature review include accountability, efficiency, effectiveness, and excellence. Quality certainly encompasses accountability, meaning a program meets some minimum set of standards and achieves its goals. It also includes efficiency. “A quality program will more likely be efficient than inefficient” (Conrad & Blackburn, 1985b, p. 287). However, effectiveness and excellence, as well as accountability and efficiency are often used interchangeably as synonyms for quality (Cameron, 1987).

Kuh’s (1981) literature review also revealed educational process and outcome variables as indicators of quality. Kuh categorized these indicators into Stufflebeam’s (1971) process and product segments of the contextinput-process-product model. Specific indicators were as follows: (pp.

10-26)

A. Process or Involvement Indicators of Quality

1. Instructional activities provided by faculty

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2. Informal interaction between students and faculty

3. Degree and kind of effort both students and faculty invest in their respective roles.

B. Product Indicators (Outcome Indicators) of Quality

1. Persistence

2. Student achievement (i.e. GRE scores)

3. Intellectual and social/emotional development of students

4. Alumni achievements

a. income

b. community service

The literature's emphasis on process and product indices of quality supports the position that assessors of quality should not overlook these important areas.

The overriding theme in the literature concerning academic program quality and effectiveness is that scholars find it hard to agree on which indicators should be used to determine program quality (Cameron, 1987; Tan, 1992). They have listed many input variables as noted in reviews of research literature and an increasing number of environment and outcome variables.

Astin's (1985, p. 60-61) "talent-development" concept of educational quality is that "true excellence lies in the institution's ability to affect its students and faculty favorably, to enhance their intellectual and scholarly

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development, and to make a positive difference in their lives." This view of quality, labeled the value-added view, does focus more on process (environment) and outcome indicators of quality.

Conrad and Pratt (1985) also present questions about processes such as what should be the percentage of time devoted to teaching, research, and service in the university, and, what does a commitment to those percentages look like in terms of academic processes? Examples of these academic processes are faculty-student interactions and development of students' critical thinking and problem solving ability. The processes taking place within the design of an academic program can be very important indicators of program quality. Also, the "extracurriculum" needs to be considered in an evaluation of academic program quality since the activities of students outside the classrooms certainly may enhance or detract from the overall learning experience of each student (Conrad & Pratt, 1985; Kuh, Schuh, Whitt, & Associates, 1991). The extracurriculum may include events such as professional group meetings that are held on or nearby the campus.

All of these considerations point to a multidimensional approach in defining indicators of quality academic programs. Quality indicators should be examined at the program level as well as the institutional level (Fairweather & Brown,

1991). According to higher education literature, (Astin, 1991; Pace, 1990) focusing more on processes and outcomes will

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help gain a better perspective on the overall indicators of quality in academic programs.

Higher education literature continues to offer further definition to academic program quality in undergraduate education (Astin, 1985; Bogue & Saunders, 1992; Kuh et al., 1991; Mayhew, Ford & Hubbard, 1990; Wenberg, 1992). Even though there are at least five different views of academic quality (nihilistic, reputational, resources, outcomes, and value-added) (Astin, 1985; Conrad & Blackburn, 1986; Conrad & Wilson, 1985; Fairweather & Brown, 1991), the general public may not consider this when evaluating the accuracy of these views used by raters such as U.S. News and World Report (1994). Most of these views do not address many of the recent research findings pertaining to quality academic program environments. For example, Astin's (1984) talent-development theory, Kolb's (1984) learning theory, and Pace's (1979, 1984, 1990) quality of student effort theory are not factors in most quality ratings. Also, the research on learning and thinking and how academic programs may adopt curricula to reflect this new knowledge is seldom addressed. The literature suggests that research on academic program environments may need to be explored further to see if certain environment and outcome variables should receive greater attention when examining academic program quality (Astin, 1985; Bogue & Saunders, 1992; Kuh, 1981; Kuh et al., 1991).

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Finally, the recent emphasis from the total quality management and continuous quality improvement movements have encompassed not only higher education administrative areas but academic programs as well (AAHE, 1994). Studying specific academic programs and continually trying to improve them is essential for higher education to remain on the cutting edge of disseminating and creating new knowledge in order to continue to meet society's needs. Thus, to provide further definition of quality in one specific higher education academic program, the research study of U.S. baccalaureate aviation programs is presented in the next three chapters.

CHAPTER IV

PHASE ONE RESEARCH DESIGN, DATA COLLECTION, AND ANALYSIS

To specifically address each of the three research questions, the study was conducted in two phases. Phase one combined quantitative and qualitative

methodology in response to the first two research questions, 1) identifying which U.S. baccalaureate aviation programs experts rate as the highest quality, and 2) what criteria do experts list as the indicators of quality among the highest quality programs. Phase two was a quantitative study designed to answer the third research question, determining to what extent the highest quality baccalaureate aviation programs emphasize literature-identified environment and outcome variables that are indicators of quality.

Phase One Research Design

Part of the phase one methodology was based on Glaser and Strauss' (1967) grounded theory constant comparative analysis. Grounded theory was chosen because the literature did not provide a clear definition of quality, especially in regard to professional baccalaureate aviation programs. Since quality is addressed in the literature as multi-dimensional, context

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specific, and shifting more toward process and outcome variables of the academic environment, a grounded theory approach to studying aviation programs, a relatively new academic program in higher education, seemed the most appropriate. This type of grounded theory research design is also similar to a study done by Mijares (1988) on U.S. baccalaureate criminal justice programs, another relatively new academic program.

The unit of analysis in this study was U.S. baccalaureate aviation programs offering flight education (See Appendix A) as part of an aviation-related baccalaureate degree. These 70 baccalaureate programs were identified from the most current Collegiate Aviation Directory (UAA, 1994).

Sample Population

The sample population for phase one included all 70 U.S. baccalaureate aviation program administrators (aviation education experts--see Appendix A), and 89 U.S. aviation industry experts (see Appendix B). The 89 aviation industry experts included 16 top-level FAA administrators, 18 directors of flight operations/training from U.S. based major/national airlines, and 55 directors of

flight operations/training from U.S. based regional airlines. Because the number of regional airlines in each of the nine FAA regions varies widely, regional airline directors of flight operations/training were randomly selected from the nine FAA regions in the United States using probability proportionate to size sampling (Babbie,

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1973). Thus, 37.5% of the regional airlines in each region were queried to obtain a sample size of 55. Fifty-five regional airlines were selected in an effort to obtain 27 responses (approximately 50%) from the regional airlines so that the combined industry and government (FAA) response would be approximately the same as the academic administrators' response.

Instrumentation

The phase one instrument was an open-ended questionnaire (see Appendix D) designed to gather data for quantitative analysis as well as qualitative analysis. The questionnaire was pilot tested on a random sample of nine directors of operations/training from the U.S. regional airlines. The pilot test results showed that follow-up telephone calls were effective in obtaining a 67% response rate. The data obtained in the pilot study also showed 1) there was a range of quality existing in U.S. baccalaureate aviation programs, 2) there was some agreement as to which programs are the highest quality programs, and 3) the criteria used to identify these high quality programs showed similarities among respondents. Minor modifications in instrumentation and protocol were made as a result of the pilot study.

Participation was invited through a cover letter to each phase one identified expert, with an explanation of the survey and a discussion of the study's possible benefits (see Appendix E). Consent to participate was

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indicated by returning the questionnaire. A phone number was included for study participants to call if a report of the completed study results was desired.

Phase One Data Collection

In the phase one questionnaire, aviation education and aviation industry experts were asked to rate each of the 70 baccalaureate aviation programs on a

Likert scale of one to five. Five was for the highest quality programs and a rating of one was for the lower quality programs. A “don’t know” column was also included for respondents to check if they did not know sufficient information about the program to rate it. After rating each of the 70 programs, the experts were asked to select and rank which programs were the ten highest quality baccalaureate aviation programs in the country and list the criteria that formed the basis for their rankings. The requirement for listing criteria was used to prompt the experts to base their rankings on more than just reputation. The frequency with which a program was ranked in the top ten was used to quantify the dependent variable in the study, program quality. The criteria given by the experts were analyzed through Glaser and Strauss’ constant comparative analysis and identified as indicators of program quality.

To avoid respondent bias of identifying the researcher with any particular aviation program, an Ann Arbor, MI, address and phone number

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were used and the questionnaires and follow-up mailings were mailed from post offices other than an aviation program’s address. Respondents mailed questionnaires to Ann Arbor, MI, and the mail was forwarded to the researcher’s home address.

Participants were asked to complete and return the questionnaire within 15 days, in a prepaid addressed envelope. A follow-up postcard (see Appendix F) was sent 10 days after the initial mailing to those participants that had not returned the questionnaire. A reminder cover letter (see Appendix G) was sent to all nonrespondents two weeks after the postcards were sent. A second reminder cover letter and questionnaire was sent to all nonrespondents three weeks later. Finally, telephone calls were initiated eight weeks after the questionnaires were first mailed to all nonrespondents. A minimum of two telephone calls were made to each nonrespondent. If the respondent requested to answer questions over the telephone, the same protocol was followed and questions were asked exactly as they appeared on the questionnaire.

Because all but one FAA expert felt they were either not in a position to judge the quality of U.S. baccalaureate aviation programs or it would be a conflict of interest if they did judge the programs, the 16 FAA experts were dropped from the phase one sample. Colleges or universities that had discontinued their baccalaureate aviation program were dropped from the

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sample. Similarly, regional airlines that had ceased operations were not included. Table 1 summarizes the phase one data collection response rates.

Table 1. Phase One Response Rates

RESPONSE RATES			
Group	Sample	%	Comments
Academic administrators	48 of 68	71 %	two of the 70 programs had dropped their aviation programs recently
Major/national airline directors of flight operations/training	10 of 18	56%	
Regional airline directors of flight operations/training	24 of 44	55%	11 of original 55 airlines had discontinued operations
Overall Response Rate	82 of 130	63%	

Phase One Quality Rating Results

The quality rating data were derived from the first part of the phase one questionnaire. Table 2 summarizes the quality rating data from each of the expert groups, academic administrators, major/national airline directors of flight operations/training, and regional airline directors of flight operations/training. Table 3 follows with the overall quality ratings with all three expert groups combined.

Table 2. Quality Ratings of Top Ten U.S. Baccalaureate Aviation Programs by Expert Group^a

Academic Administrators (N=68)				Majors/Nationals (N=18)				Regionals (N=44)			
Ranked Programs	Mean	S.D.	~ ^b	Ranked Programs	Mean	S~D~	nb	Ranked Programs	Mean	S.D.	nb
1. UND	4.43	.57	28	1. UND	5.00	.00	5	1. Purdue	4.75	.50	4
2. Purdue	4.35	.57	23	2. Purdu	4.40	.89	5	2. Parks	4.50	.71	2
3. Parks	4.25	.68	24	e	4.25	.96	4	2. SIU-	4.50	.71	2
4. ERAU~D	4.21	1.09	29	3. OhS	4.00	.96	4	C.	4.33	.56	3
.c	4.15	.67	20	U	4.00	.00	2	4. Aubur	4.00	1.27	6
5. OhSU	4.13	.64	15	3. ERA	4.00	1.00	3	n	4.00	.00	2
6. DWCC	4.00	.87	17	U-D.	4.00	1.00	3	5. UND	3.67	.56	3
7. CMSU	3.87	.71	22	5. ERA	3.50	.71	2	5. OhSU	3.50	.71	2
8. SIU-C.	3.87	.83	15	U-P.	2.50	.58	4	7. UthS	3.33	1.53	3
8. WMU	3.79	.90	29	5. Aubur				8. SU	3.00	.00	2
10. ERAU-P.				n				9. FITC			
				5. Parks				10. MTS			
				5. SIU-C.				U			
				9. SJSU							
				10. FIT							

^a Programs rated on a 1-to-5 scale, with a “5” representing the highest quality programs. Respondents could also

check a “don’t know” column. No significant differences among groups ($p < .05$) except as noted in ^cbelow.

Abbreviations for programs are listed in Appendix H.

^b The small *n* denotes the number within each expert group responding with a 1 -to-5 rating for that particular program. Only those programs rated at least twice were included in this table.

^c Significant differences ($p < .05$) exist between the academic administrator’s score and the regional airline director of operations/training score for each of these programs.

Table 3. Combined Quality Ratings of Top Ten U.S. Baccalaureate Aviation Programs as Listed by Expert Group

All Three Expert Groups Combined (N = 130)			
Ranked Programs	Mean	S.D.	n [~]
1. UND	4.44	.72	39
2. Purdue	4.41	.62	32
3. Parks	4.24	.69	29
4. OhSU	4.15	.68	26
5. CMSU	4.06	.87	18
6. ERAU-	4.00	1.21	39
D.	4.00	.79	17
6. DWC	3.93	.73	27
8. SIU-C.	3.88	.86	17
9. WMU	3.76	.93	37
10. ERAU- P.			

^a Programs rated on a 1 -to-5 scale, with a “5” representing the highest quality programs.

Respondents could also check a “don’t know” column. Abbreviations for programs are listed in Appendix H.

^b The small *n* denotes the number responding with a 1-to-5 rating for that particular program. Only those programs rated at least twice were included.

Testing for Differences in Quality Ratings

To test for significant differences in mean ratings of the academic administrators, major/national airlines, and regional airlines, ANOVAs were computed using the statistical package SPSS-X. A Scheffe test to determine between which groups the differences were significant was also accomplished. Due to the high number of “don’t know” responses from major/national airline experts and the regional airline experts, only 18 ANOVAs could be analyzed. Of these 18, only three identified significant

differences ($p < .05$) among groups rating a particular program. These programs were Embry Riddle-Daytona, Florida Institute of Technology, and Daniel Webster College. In all three cases, the academic administrator’s mean rating was higher than the regional airline mean rating.

To further test for differences between academic administrator's ratings and industry ratings by combining the ratings from the major/national airlines experts with the regional airline expert ratings, t tests were computed on 39 of the baccalaureate aviation programs. The other programs had no rating responses from either the major/national airline or the regional airline experts. Again, using the $p < .05$ significance level, the same three aviation programs exhibiting significant differences in the ANOVAs, also exhibited significant differences using the t test. The t values were Embry Riddle-Daytona ($t = 1.87$, $df = 37$); Florida Institute of Technology ($t = 3.40$, $df = 30$); and Daniel Webster College ($t = 2.10$, $df = 15$). The other 36 t tests showed nonsignificant differences between the academic administrator mean ratings and the industry expert mean ratings.

Phase One Quality Criteria and Top Ten Ranking Results

The quality criteria and ranking results were obtained from the second part of the phase one questionnaire. This part was an open-ended questionnaire allowing the respondents to list the top ten baccalaureate aviation programs in the United States. Also, the respondents were asked to

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list the criteria they used to rank each of the aviation programs. The criteria were used to develop a grounded theory of quality in baccalaureate aviation programs using Glaser and Strauss' (1967) constant comparative analysis.

Glaser and Strauss' methodology identifies the dependent variable as the constant (program quality) and the independent variables as the comparative data (quality criteria). The dependent variable in phase one was measured by the frequency of top ten rankings of the baccalaureate aviation programs, while the criteria given by the experts to support the top ten rankings were the independent variables and identified as indicators of quality.

Data obtained from the three groups of experts (aviation program administrators, major/national airline directors of operations/training, and regional airline directors of operations/training) were analyzed separately to determine degree of group variability. The criteria were compiled by ranking for each expert group. For example, all the criteria listed for each number one program ranked by the academic administrators were grouped together followed by all criteria for the number one program ranked by the major/national directors of flight operations/training.

The criteria from the three groups of experts were used to develop a model of program quality in U.S. baccalaureate aviation programs. Ten categories evolved from the criteria listed by the experts to form a model of quality in U.S. baccalaureate aviation programs. Some subcategories were

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identified to more clearly define particular categories. The ten categories, all indicators of program quality in U.S. baccalaureate aviation program, and the subcategories are defined as follows:

1. Curriculum

- a. Curriculum .the breadth and depth of course offerings within the aviation program as well as within the college/university where the program is located.
- b. Scholarship .the degree that high academic standards are upheld--the academic rigor and academic credibility of the aviation program.

2. Students

- a. Performance of graduates .the desired abilities displayed by the aviation program graduates while on the job, primarily at the regional airlines.
- b. Number of students .the number of aviation students within the program as well as the number of students attending the college/university campus. Experts indicated small, medium, and large aviation programs and small, medium, and large college/university campuses as indicators of quality. No clear trend developed.
- c. Student selectivity .establishing minimum grade point averages or ACT scores for entrance into the aviation program.

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3. Faculty

- a. Faculty .the qualifications and technical expertise of the aviation program's faculty and flight instructors.
- b. Instruction .the quality and level of flight instruction given in simulators, aircraft, and the classroom.
- c. Dedication .sincere, ceaseless efforts by personnel within the aviation program to offer the best education possible.

d. Research .the degree that aviation program faculty and administration carry out investigations to create new knowledge in the field.

4. Program Activities

a. Student development/internships .the number and variety of student development opportunities including co-op programs, internships with airlines, industry seminars, professional meetings, etc.

b. Flying team .the perceived success of the aviation program's flying team to the degree it contributes to the overall quality of the program.

c. Industry relations .the ability of the aviation program to actively seek out and establish internship and co-op programs as well as establish on-going working relationships with industry representatives for the improvement of aviation education within that particular program.

d. Student placement .the degree the aviation program aggressively attempts to find employment for its graduates within the aviation field.

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e. Alumni relations .the degree the aviation program actively receives input from its alumni to enhance its program.

f. Service .the degree the aviation program provides help and expertise to the general public in aviation related areas.

g. Graduate school .the perception that a graduate program in aviation enhances the undergraduate education of a particular aviation program.

h. Advertising .the perception more advertising provides for a higher quality aviation program.

i. Minority recruitment .efforts to recruit and obtain more minority students enhances the aviation program's educational experience.

5. Equipment .the number and variety of simulators and aircraft the aviation program has for use by its students. Computer equipment is also included.

6. Facilities

a. Facilities .the physical plant of the aviation program, i.e., buildings, classrooms, airport hangars, briefing rooms, etc.

b. Location .the geographic location of the program provides for a better education for the student.

7. Leadership

a. Leadership .the demonstrated ability of the aviation program's administration and faculty to lead their program toward excellence.

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b. Innovation .the ability of aviation program administration, faculty, and staff to continually think of improved ways of educating our future aviation professionals.

8. Resources

a. Resources .the internal and external funding sources available to the aviation program.

b. Grantsmanship .the ability of the aviation program to successfully compete for outside agency funding.

9. Reputation .the general knowledge by the expert that the aviation program is well respected in aviation education/aviation industry circles.

10. Value (cost) .the perception that the aviation program's offerings are worth the cost of tuition and flight program fees.

Table 4 identifies the percentage of experts from each of the three expert groups that mentioned each of the ten criteria categories. The academic administrators view quality aviation programs from more of a multi-dimensional perspective than experts from the aviation industry, especially experts from the regional airlines. The regional airline experts focused almost entirely on the student category, specifically the performance of graduates. When combining all three groups, the order of importance for each criteria category that emerged was 1) curriculum, 2) students, **3) faculty**, 4) program activities, 5) equipment, 6) facilities, 7) leadership, 8) resources, **9) reputation**, and 10) value.

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TABLE 4. Percentage of Each Expert Group Mentioning Each Indicator of Quality Category

	Academic Administrators N=68 %8	Major Airlines N=18 %8	Regional Airlines N=44 0/a	All Groups Combined N=130 %8
Curriculum	88	43	18	67

Students	50	71	100	63
Faculty	74	57	9	58
Program Activities	62	29	9	46
Equipment	53	14	9	38
Facilities	47	14	9	35
Leadership	18	29	9	17
Resources	26	0	0	17
Reputation	24	14	0	17
Value	6	14	0	6

a Percentages figured by dividing total number of experts mentioning criteria for the top ten programs by the number of experts mentioning criteria for each category.

To illustrate how the ten categories of indicators of quality were listed to support the top ten rankings by percentage of each expert group mentioning criteria for each ranked program, Table 5 is provided. The column labeled "Frequency" displays the number of times each aviation program was listed in the top ten rankings. This frequency determined the rank order of each program listed in Table 5. For example, Ohio State was listed 13 times, making it the fifth most frequently mentioned program. If any of the experts had either graduated from a school they ranked, or they were affiliated with a particular program and they ranked that program in the top ten, it was not counted. This was done to help eliminate possible respondent bias.

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Programs ranked only once in the top ten were not included in Table 5 since there were only three additional programs ranked and only one criteria was mentioned for each aviation program. It was determined this data would not benefit the analysis because of its infrequent and sporadic nature. In addition, Mijares (1988) also excluded programs ranked only once in his study of criminal justice programs for these same reasons.

It is interesting to note that the criteria mentioned by the greatest percentage of experts in Table 5 are present in the high ranked programs. Programs mentioned more frequently also were identified by a wider range of criteria. However, the direction and strength of the relationships among these criteria, or indicators of quality, can also be shown through correlational analysis, similar to Mijares' (1988) study of criminal justice programs. Table 6 displays a correlation matrix showing the intercorrelations between each of the ten categories of criteria (independent variables) as well as the dependent variable, ranked frequency. Since for phase one of the study, the level of program quality was determined by the number of times a program was ranked in the top ten, the frequency column actually establishes the relationship of the individual independent variables (curriculum, students, etc.) to the dependent variable of program quality. The indicators of quality with the highest correlation to program quality were curriculum and faculty ($r = .93$). The eight other indicators of quality also correlated significantly ($p < .01$) with program quality and are listed in Table 6.

Table 5. Percentage of Experts Listing Criteria for Top Ten Rankings for Each U.S. Baccalaureate Aviation Program

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a Number of times program ranked in were not included in this table.
top ten (program quality). Programs ranked only once in the top ten

Ranked Programs	Ranked Frequency ^a	Curriculum	Students	Faculty	Program Activities	Equipment	Facilities	Leadership	Resources
Univ of North Dakota	22	38	24	32	26	15	29	15	15
ERAU -Daytona	18	41	24	26	24	18	18	9	9
Purdue	18	35	29	32	24	21	9	3	6
Parks	13	32	18	21	18	9	15	9	9
Ohio State	13	24	15	15	12	3	9	9	6
ERAU -Prescott	12	12	15	12	9	3	3	0	3
SIU -Carbondale	8	21	21	15	21	6	3	3	3
Daniel Webster	5	6	0	12	6	6	6	6	3
Dowling College	5	3	3	12	6	0	6	3	3
Central Mo. State	5	9	3	6	6	0	3	3	3
Arizona State	5	3	3	9	6	0	0	3	0
Western Michigan	4	9	3	0	9	3	0	6	3
Florida Institute Tech	4	12	0	9	6	0	6	6	3
Moody Bible Institute	3	9	3	6	0	3	0	0	0
Middle Tennessee St.	3	9	0	6	3	3	6	6	3
Louisiana Tech	3	0	3	3	0	0	0	0	0
Auburn	3	9	6	3	3	0	6	0	0
Ohio University	2	6	3	8	3	3	0	6	0
San Jose State	2	3	3	0	0	0	0	0	0
Indiana State	2	3	6	9	3	0	3	0	3
Central Texas	2	3	9	3	3	6	0	0	3
St. Cloud State	2	0	3	0	0	0	0	0	0

Table 6. Phase One Intercorrelations Between Criteria Identified as Indicators of Quality in U.S. Baccalaureate Aviation Programs and Program Quality^a

	Program Quality	Curriculum	Students	Faculty	Program Activities	Equipment	Facilities	Leadership	Resources
Program Quality	1.00								
Curriculum	.93	1.00							
Students	.89	.88	1.00						
Faculty	.93	.90	.85	1.00					
Program Activities	.92	.94	.91	.91	1.00				
Equipment	.83	.86	.85	.86	.85	1.00			
Facilities	.84	.84	.66	.83	.78	.94	1.00		
Leadership	.66	.70	.41~	.84	.66	.69	.81	1.00	
Resources	.87	.86	.73	.84	.84	.94	.94	.82	1.00
Reputation	.79	.74	.66	.73	.69	.83	.83	.62	.83
Value	.66	.59	.54	.60	.81	.69	.69	.59	.75

N = 22 programs

a All intercorrelations significant at the $p < .01$ level except as noted below. Program quality was quantified as the number of times program ranked in top ten.

Non-significant relationship

Phase One Predictors of Aviation Program Quality

The multiple regression analysis was accomplished using a preset order for entering the correlates of program quality into the regression equation. The preset order was established by the percentage of experts mentioning criteria within each indicator of quality category (see Table 4). Thus, curriculum was entered into the regression equation first, followed by the other nine possible predictors in order of importance as established by Table 4. However, eight of the ten correlates of program quality would not enter the equation unless forced to enter. Therefore, only curriculum and faculty entered as predictor variables at the $p < .05$ level.

Table 7 displays the results of the regression analysis. Partial correlations are given to show the effect each particular variable has on the dependent variable program quality as it is entered into the equation while controlling for the other independent variables in the equation. Also the multiple correlation (R) is shown for each variable as it is entered into the equation along with the corresponding A^2 value, R^2 added value, and overall F value. The last column of the table displays the final beta coefficient when all the predictor variables are in the equation.

In summary, phase one of the study focused on determining which U.S. baccalaureate aviation programs were the highest quality, as well as identifying the criteria that are indicators of quality in the highest quality program. These results provided answers to the first two research questions

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of the study. Further discussion of the results takes place in Chapter VI, after the phase two results are reported in Chapter V.

Table 7. Multiple Regression of Indicators of Quality (Predictors) on Program Quality (Criterion) with Predictor Variables Entered by Preset Order

Predictor Variable	Partial Correlation	R	R^2	R^2 added	Overall F	Final Beta
Curriculum	.93	.93	.86	.86	128.11***	.48**
Faculty	.60	.96	.91	.05	99.65***	.50**

N = 22 programs

$p = < .01$

$p = < .001$

CHAPTER V

PHASE TWO RESEARCH DESIGN, DATA COLLECTION, AND ANALYSIS

Phase Two Research Design

Phase two was designed to be a specific look at literature-identified environment and outcome variables of academic program quality. It was a quantitative study of six of the top ten highest quality U.S. baccalaureate aviation programs, as well as six randomly selected intermediate quality programs, and six randomly selected low quality programs. Intermediate quality programs were those programs rated in the middle one-third of programs as a result of the phase one findings. Low quality programs were those rated in the lower one-third of programs in phase one. The purpose of phase two was to determine to what extent the highest quality U.S. baccalaureate aviation programs follow current literature trends and emphasize environment and outcome indicators of quality. Regardless of what criteria emerged as indicators of quality in phase one's grounded theory approach to quality, determining whether the highest quality U.S. baccalaureate aviation programs are following current literature trends and emphasizing environment and outcome variables of program quality seemed essential in a study of academic program quality.

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To obtain input from both the phase one quantitative and qualitative rankings in order to select the highest quality baccalaureate aviation programs for the phase two study, each of the data were weighted 50%. The ranking from each data set was simply added together. Thus, the aviation program with the lowest score was the number one ranked program and so forth. Table 8 summarizes the top ten U.S. baccalaureate aviation programs using the combined data sets.

Table 8: Overall Phase One Data Rankings (N= 130)

		(A) Quantitative Ranking	(B) Qualitative Ranking	(A+B) Overall Score	Overall Ranking
1.	University of North Dakota	1	1	2.0	1
2.	Purdue	2	3	5.0	2
3.	Ohio State	4	4	8.0	3
4.	Embry Riddle-Daytona	6	2	8.5	4
5.	Parks College	3	6	9.0	5
6.	Daniel Webster	6	8	14.5	6
7.	SIU/Carbondale	8	7	15.0	7
8.	Embry Riddle-Prescott	10	5	15.0	7

9.	Central Missouri	5	12	17.0	9
10.	Western Michigan	9	13	22.0	10

The overall ranking of all 68 U.S. baccalaureate aviation programs was used to select the 18 programs that were studied in phase two. From the overall phase one data rankings table, the six highest quality programs were

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selected from the top ten programs. The six intermediate ranked programs were randomly selected (with a table of random numbers) from the overall rankings as well. Finally, six programs were randomly selected from the programs ranked in the lower one-third.

If one of the 18 aviation programs decided not to participate in phase two of the study, the seventh highest ranked program was selected for the top program sample and so forth. For the intermediate and low quality program samples, another program was randomly selected from the applicable category.

Sample Population

In phase two of the research, the 18 U.S. baccalaureate aviation programs were studied through an ETS Program Self-Assessment Survey filled out by faculty, students, and alumni from each of the 18 aviation programs. Undergraduate aviation students at each program, classified academically as seniors, comprised the student sample. The assumption was that senior students were better able to judge the program's quality than junior, sophomore, or freshman aviation students. All aviation faculty members at each program comprised the faculty sample. In addition, the 18 baccalaureate aviation programs were asked to provide a list of alumni and their addresses who had graduated from the aviation program in the past ten years. A randomly selected sample (using a table of random numbers) of 50

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alumni from each program was invited to participate in the study. The completed questionnaires from the faculty, students, and alumni were used to analyze to what extent the highest quality baccalaureate aviation programs emphasize environment and outcome indicators of quality.

Instrumentation

The ETS's Program Self-Assessment Surveys were used as the measurement instruments for phase two (see Appendices I, J, and K). Each ETS instrument addresses whether U.S. baccalaureate aviation programs emphasize key environment

and outcome indicators of quality as measured by perceptions of students, faculty, and alumni. The instruments are Likertscaled measurement instruments consisting of a 62-item program quality assessment questionnaire developed by Clark (1983) and the ETS. The instruments were initially developed for graduate programs but were recently modified for undergraduate academic programs. These instruments were chosen because they measure to what extent students, faculty, and alumni perceive their aviation program emphasizes key environment and outcome variables of program quality. Furthermore, the literature review showed that quality academic programs are shifting their focus from input variables to environment and outcome variables.

ETS developed similar but separate instruments for students, faculty, and alumni. The reliability coefficient alpha for the instruments is $\alpha = .83$

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(Clark, 1983) for surveying graduate programs. A pilot test was accomplished on aviation faculty and students to check for reliability of the instruments for undergraduate aviation programs. A test-retest procedure was conducted 14 days apart for both the faculty and students. The faculty instrument test-retest correlation coefficient obtained was .93 ($p < .05$). The student instrument revealed a test-retest correlation coefficient of .83 ($p < .01$). With these relatively high values, the instruments appeared to be reliable instruments for use in researching program quality in U.S. baccalaureate aviation programs.

To ensure content and construct validity of the instruments, a group of five experts were randomly selected from the University Aviation Association's list of Council on Aviation Accreditation accreditors. These experts were mailed a cover letter (see Appendix L) along with the three instruments. They provided feedback as to whether each of the three instruments (faculty, student, and alumni) was a valid measure of baccalaureate aviation program quality. Four of the five experts all agreed that all three instruments were valid measures of quality. The fifth expert was not able to respond due to other professional commitments. However, with four of the experts all in agreement, it was concluded that the instruments would be valid for this particular type of research on baccalaureate aviation programs. The instruments consist of a perceptions of program quality section and a demographic section. Applicable

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demographic items, as well as items suggested by the CAA panel of experts, were added to a supplemental section of each instrument.

Phase Two Data Collection

The program administrators of each of the 18 aviation programs were contacted

by telephone and the importance of the research study was explained along with the protocol procedures. An introductory consent letter (Appendix M) was also sent to each administrator clarifying the research study. Two programs in each of the three groups (high, medium, and low quality programs) declined to participate for various reasons, ranging from time constraints on faculty and students to a perception that their input would be of little benefit given their particular circumstances (e.g., program was going to close, unionized faculty were on strike). Thus, two other programs in each group were selected and participation approval was obtained.

A research assistant to act in the researcher's behalf was obtained at each of the 18 programs. This was done to insure minimum sampling error and expeditious data collection. The research assistant was either the aviation program administrator, an aviation faculty member, or in one case, a graduate student. The protocol of the research was explained to each research assistant. The assistants were then sent the appropriate number of faculty and senior-level student ETS questionnaires for their respective

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program. The research assistant distributed student and faculty questionnaires (Appendices I and J) along with cover letters (Appendices N and O) at a convenient time during the semester. The purpose of the study and directions for the questionnaire were explained in the cover letter. The assistant collected and returned the questionnaires to the researcher, maintaining respondent confidentiality. Some programs were not able to allow class time for the students to complete the questionnaire. In these cases, the response rates suffered. Also, some assistants were not as diligent as others to administer and collect the questionnaires. As a result it took four months to receive all the questionnaires.

The response rates for students and faculty were fairly similar between the two groups but within each group the low quality program students and faculty responded at a much higher rate than both the intermediate and high quality program students and faculty. A possible explanation for this may have been closer interaction by the research assistant to faculty and student respondents at the low quality programs due to the programs' small size. The overall student response rate was 59% (N =447). Students from the highest quality programs responded at a rate of 54% (N =268), while the student response rate from intermediate quality programs was 63% (N=135), and from low quality programs 77% (N =44). The overall faculty response rate was also 54% (N = 167). The highest quality program faculty responded at a 49% rate (N = 119), the intermediate

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quality program faculty responded at a 55% rate (N =31), and the low quality program faculty responded at a 88% rate (N=17).

The alumni responses were obtained through a mail survey of the ETS alumni questionnaire. Each of the 18 aviation programs did provide a listing of names and

addresses of alumni who had graduated with an aviation degree during the past ten years. A maximum of 50 respondents were then randomly selected from the alumni lists. Seven programs had not graduated a total of 50 alumni in the past ten years, so all graduates of these programs in the past ten years were surveyed. A cover letter (Appendix P) explaining the purpose of the research was sent to each alumnus along with the ETS alumni questionnaire (Appendix K). The overall response rate for the alumni after a postcard follow-up (Appendix Q) and an additional follow-up letter (Appendix R) was 42% (N =577). The response rate for the alumni of the highest quality programs was 42% (N =286), for the intermediate group 40% (N=154), and for the lower quality group 43% (N=137).

In an effort to learn more specific program information about each of the 18 aviation programs, a short aviation program administrator questionnaire (see Appendix 5) was mailed to each aviation program administrator. The questionnaire asked the administrator to provide program information on, for example, course enrollments, types of program funding, and pass/fail rates on FAA checkrides. The information was used as

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independent variables in the phase two analysis for determining possible additional correlations with academic program quality.

Phase Two Results and Analysis

The survey data gathered from phase two was analyzed utilizing the Statistical Package for Social Sciences (SPSS-X). Scores were analyzed separately for students, faculty, and alumni from each program. The unit of analysis shifts from the program level to the individual student, faculty, and alumni level for the first part of the phase two analyses. The shift allowed ANOVAs to be analyzed on the student, faculty, and alumni means from high, medium, and low quality programs since the number of subjects was much higher than for data at the program level. This level of analysis was more sensitive to determining significant differences between students, faculty, and alumni. The results are displayed in Tables 9, 10, and 11. The unit of analysis reverts back to the program level for the correlational and regression analyses when analyzing the academic administrator questionnaire data. (See Tables 12 and 13.)

The response means, plus or minus the standard deviations for students, faculty, and alumni from each program for the seven comprehensive indicators of quality from the ETS instruments, are displayed in Appendix T, Table T1 (students), Table T2 (faculty), and Table T3 (alumni). The comprehensive

indicators of quality are so labeled since they

receive input from students, faculty, and alumni. The means, plus or minus standard deviations for specific ETS instrument indicators of quality, are displayed in Appendix T, Table T4 (students), Table T5 (faculty), and Table T6 (alumni) for each program as well.

Testing for Differences in Phase Two Results

To test for significant differences between student, faculty, and alumni from the highest quality programs, intermediate quality, and lower quality programs, ANOVAs were computed using the statistical package SPSS-X. ANOVAs were accomplished for each of the applicable 16 composite indicators of quality on the ETS instrument.

ANOVAs on student data. Of the eleven applicable student indicators, ANOVA analysis found significant differences in five of the eleven scales. A Scheffe test was accomplished to determine between which groups the means were significantly different. Table 9 displays these differences.

Interpreting the data from this table, three statistically significant determinations can be made. First, students attending intermediate quality aviation programs perceive a more conducive environment for learning and greater student accomplishment than students attending high quality programs. Second, students attending high quality programs perceive greater availability of resources and better internship experiences than students attending either intermediate or low quality aviation programs.

Finally, students attending intermediate quality aviation programs perceive greater accessibility to resources than students attending low quality aviation programs.

TABLE 9. Comparison of Means \pm Standard Deviations for Indicators of Quality As Rated by Students in High, Medium, and Low Quality Programs

	Students (N = 447)				
	High Quality Programs	Medium Quality Programs	Low Quality Programs	F Value	p =

	(N=268)	(N=135)	(N=44)		
Environment for Learning	2.93 ± .43 ^a	3.10 ± .45 ^a	2.97 ± .44	3.68	.0267
Scholarly Excellence	2.98	2.99 ± .63	2.85 ± .51		NS
Quality of Teaching	± .43	2.92 ± .65	2.92 ± .52		NS
Faculty Concern for	2.97				
Students	± .45	3.04 ± .57	2.98 ± .57		NS
Curriculum		2.52 ± .71	2.37 ± .58		NS
Departmental Procedures	2.88 ± .48	2.69 ± .62	2.61 ± .58		NS
Available Resources	2.63	2.41 ± ^a .61b	2.12 ± ^a .57b	22.46	.0000
Student Satisfaction with	± .54				
Program	2.65	3.19 ± .68	3.16 ± .55		NS
Internships	± .46	2.90 ± ^a .32b	2.69 ± ^a .40b	8.76	.0004
Resource Accessibility	2.78	2.56 ± ^a .775	2.19 ± .68c	4.31	.0144
Student Accomplishments	± ^a .56b	.49 ± ^a .19d	.45 ± .18	9.44	.0001
	3.32 ± .60				
	3.15				
	± ^a .37b				
	2.37				
	± .60				
	.38±				

NS = Non-significant difference

^a Significant differences exist between high quality programs and medium quality

programs

^b Significant differences exist between high quality programs and both medium and

low quality programs

^c Significant differences exist between medium quality programs and low quality

programs

^d Significant differences exist between high quality programs and medium quality

programs

ANOVAs on faculty data. Only one of the eleven ETS indicators of quality scales showed significant differences between high, medium and low quality programs (see Table 10). The environment for learning scale was rated significantly higher by the intermediate quality programs when

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compared to faculty ratings from the highest quality programs. All other scales showed no significant differences. Thus, the only statistically significant determination that can be made from the faculty questionnaires is intermediate quality program faculty perceive the environment for learning of their respective program at a higher level than faculty at the highest quality programs.

TABLE 10. Comparison of Means ± Standard Deviations for Indicators of Quality As Rated by Faculty in

High, Medium, and Low Quality Programs

	Faculty (N=167)			F Value	p =
	High Quality Programs (N=119)	Medium Quality Programs (N=31)	Low Quality Programs (N=17)		
Environment for Learning	3.05 ± .398	3.35	3.20 ± .4	4.04	.0211
Scholarly Excellence	2.96 ±	± .38"			NS
Quality of Teaching	.44	2.95	3.01 ± .3		
Faculty Concern for Students	2.91 ±	±	3.06 ± .5		NS
Curriculum	.55	.38			
Departmental Procedures	3.06 ±	3.10	3.29 ± .5		NS
Available Resources	.47	±	2.51 ± .7		NS
Faculty Work Environment	2.72 ±	.41	2.81 ± .4		
Faculty Program involvement	.59	3.29	2.23 ± .7		NS
Faculty Research Activities	2.80 ±	±	3.09 ± .4		NS
Faculty Professional Activities	.55	.39			
	2.64 ±	2.68			NS
	.65	±	1.98 ± .6		
	2.86 ±	.69			NS
	.46	2.99			
	1.84 ±	±	1.87 ± .2		NS
	.531.81 ±	.46			
	.231.67 ± .32	2.36	1.69 ± .23		NS
		±			
		.61			
		3.06 ±			
		.53			
		2.04 ± .9			
		1.85 ± .2			
		1.67 ± .2			

NS = Non-significant difference

a Significant differences exist between high quality programs and medium quality programs

ANOVA5 on alumni data. For the alumni ETS questionnaire, there were ten applicable indicators of quality. ANOVA analysis found significant differences in only two of the ten scales among the three groups of alumni.

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The two scales where significant differences were found were available resources and internships. A Scheffe test was done to determine between which groups the means were statistically significant. Table 11 displays these differences. From the data in Table 11, two statistically significant determinations can be made. The first addresses the indicator available resources. Alumni who attended the highest quality programs perceive they had greater availability of resources than alumni who attended either intermediate or low quality programs. Second, alumni graduating from high quality programs perceive greater benefit from their internship experiences than alumni graduating from low quality programs.

TABLE 11. Comparison of Means \pm Standard Deviations for Indicators of Quality As Rated by Alumni in High, Medium, and Low Quality Programs

	Alumni (N=577)			F Value	p =
	High Quality Programs (N=286)	Medium Quality Programs (N=154)	Low Quality Programs (N=137)		
Environment for Learning	2.98 \pm .41	2.94 \pm .43	2.78 \pm .57	30.06	NS
Scholarly Excellence	2.88 \pm .58	2.72 \pm .59	2.82 \pm .62	5.95	NS
Quality of Teaching	2.95 \pm .53	2.79 \pm .59	2.85 \pm .61		NS
Faculty Concern for Students	2.98 \pm .54	2.87 \pm .59	2.93 \pm .70		NS
Curriculum	2.42 \pm .65	2.29 \pm .70	2.38 \pm .63		.0000
Departmental Procedures	2.43 \pm .58	2.37 \pm .63	2.39 \pm .60		NS
Available Resources	2.90 \pm .58 ^a	2.25 \pm .67 ^o	2.26 \pm .63 ^a		NS
Student Satisfaction with Program	3.03 \pm .73	2.82 \pm .74	3.00 \pm .76		.0035
Internships	3.03 \pm ^{a0b}	2.70 \pm .54	2.56 \pm ^{74b}		NS
Employment Assistance	1.32 \pm .63	1.27 \pm .79	1.40 \pm .59		

NS - Non-significant differences

^a Significant differences exist between high quality programs and both medium and low quality programs

^b Significant differences exist between high quality programs and low quality programs

Comparing Phase Two Indicators of Quality with Phase One Program Quality Scores

A correlational analysis was done to determine if any of the 16 indicators of quality in phase two correlate with the phase one expert ratings. Results showed that of the 16 indicators of quality only "faculty concern for students" correlated significantly with the phase one program quality ratings. However the correlation was negative ($r = -.57$, $p < .01$). Accordingly, as the quality of the program increases as determined in phase one, the faculty's concern for students at those higher quality programs decreases. The results of this correlational analysis support the results of the phase two ANOVA analysis. Among the 16 ETS indicators of quality, one would suspect that if there were not many significant differences between the high quality programs and either the medium and low quality programs, there also would not be many significant correlates between the 16 indicators of quality in phase two and the phase one determined program quality scores.

A stepwise regression analysis was also done on this data set. The two variables that entered the stepwise regression analysis were faculty concern for student ($R^2=.33$, $p<.01$) and internships ($R^2=.56$, $p<.01$). This analysis further supports a finding that except for internship experiences, the phase one identified high quality programs do not

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emphasize environment and outcome indicators of quality to any greater extent than the phase one identified medium and low quality programs.

Phase Two Correlational Analysis of Aviation Program Information

To gain additional information about the 18 aviation programs studied in phase two and to identify program characteristics associated with the highest quality programs, a correlational analysis was also done on data obtained from the academic administrator questionnaire (Appendix 5). The aviation program characteristics were independent variables and included enrollment numbers (course enrollment and majors), facilities, number of aircraft utilized for training, student-faculty ratios, entrance requirements, percent of internal funding (student flight and simulator costs) versus appropriated money or other external dollars, teaching workload by credit hours, curricular options of the students, airway science program funding, financial technological support, program centrality, program interrelationships, and pass/fail rates on FAA flight and simulator check rides. Demographic data of individual faculty members, students, and alumni were also collected and included faculty degrees and certification, student's hometown, and alumni job description. These variables were selected after considering the literature on program quality research and identifying unique characteristics of baccalaureate aviation programs. The dependent variable, program quality, as operationalized in phase two, was measured by the

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average mean scores for the ETS instrument indicators of quality scales. The mean scores for each of the scales were summed to obtain an average mean score for students, faculty, and alumni for each program. These average mean scores were totaled to give a program quality score for each of the aviation programs studied in phase two. These scores were displayed in Appendix T, Table T4 (students), Table T5 (faculty), and Table T6 (alumni).

Table 12 displays the intercorrelations among each of the independent variables (aviation program characteristics), as well as the dependent variable program quality (the last variable across the bottom of the table). The variable

“program is a separate department” ($r=.47$, $p<.05$) was the only significant correlate with program quality out of the 29 independent variables. This variable identified whether the aviation program was administered as a separate department within the college or university or whether it was a part of another department such as business or engineering. The number of programs was 19 in the analysis and not 18 because seven programs were selected from the low quality program group instead of six since one program was so new it did not have any alumni.

Some interesting intercorrelations among the independent variables that were significant ($p<.05$) were number of majors and pass/fail rates of FAA checkrides. The negative correlation between these two variables indicates that the greater number of majors at an aviation program, the lower

TABLE 12. Phase Two Intercorrelations Between U.S. Baccalaureate Aviation Program Characteristics and Program Quality

Program Variables by Academic Admin. Questionnaire Number (Appendix S)	1	2A	2B	3	4	5	6	7A	7B	8
1. Number of Majors		1.00								
2A. Flight Course Class Size		.63"	1.00							
2B. Nonflight Course Class Size	.72"	.60"	1.00							
3. Provide Own Flight Training		.40	.37	.63"	1.00					
4. Number of Aircraft Utilized		.65"	.74"	.65"	.60"	1.00				
5. Number of Aircraft Owned		.64"	.75"	.66"	.55"	.99"	1.00			
6. Number of Aircraft Leased		-.02	-.09	-.12	-.19	-.18	-.22	1.00		
7A. Number of Full-time Faculty		.24	.26	.53'	.46'	.58"	.60"	-.22	1.00	
7B. Number of Part-time Faculty	.00	-.25	.17	.23	.20	.21	-.04	.70"	1.00	
8. Entrance Requirements		.16	.13	.13	.23	.32	.31	.28	.30	.21 1.00
9. Graduation Requirements		.33	.07	.02	-.01	.13	.13	-.11	-.21	-.16.13
10. % of Internal Funding	-.09	.02	.10	.34	.21	.23	-.31	.04	-.00	.10
11. % of State/External Funding	.09	-.02	-.10	-.34	-.21	-.23	.31	-.04	-.00	-.09
12. Airway Science Funding Now	-.19	-.21	-.39	-.46'	-.30	-.27	-.33	-.26	-.21	-.04
13. Past Airway Science Funding	.39	.19	.33	.26	.47'	.49'	-.46'	.48'	.19	.15
14. Teaching Workload	-.02	.04	.04	-.36	-.00	.06	-.52'	.01	-.07	-.25
15. Number of Curricular Options	.70"	.47'	.50'	.29	.57'	.54'	-.01	.16	.12	-.19
16. Program Centrality	.25	.27	.30	.23	.35	.36	.31	.48	.28	.48
17. Program Separate Department	.39	.30	.54'	.14	.41	.42	.18	.46'	.19	.23
18A. Checkride Pass/Fail Rate-Private		-.69'	-.56	-.52	-.09	-.60	-.63'	.27	-.61'	-.23-.05
18B. Checkride Pass/Fail Rate-Commercial		-.62'	-.51	-.55	-.09	-.41	-.46	.14	-.81"	-.09-.14
18C. Checkride Pass/Fail Rate-Instrument		-.59	-.48	-.57	-.13	-.36	-.40	.13	-.79"	-.09-.06
18D. Checkride Pass/Fail Rate-CFI		-.32	-.32	-.39	.12	-.32	-.38	.35	-.15	-.09.24
1 SE. Checkride Pass/Fail Rate-CFI		-.35	-.16	-.33	.06	-.29	-.32	.32	-.44	.04.07
18F. Checkride Pass/Fail Rate-MEI		-.13	-.03	-.37	-.41	-.06	-.06	.41	-.27	.19.30
19. Suitable Office Space	.02	.09	.06	.08	.10	.14	-.08	.12	.12	.41
20. Comparable Faculty Salaries	.23	.08	-.26	-.29	-.02	-.04	.16	-.50'	-.22	-.26
21A. Financial Support		-.17	-.18	-.28	-.08	-.02	-.03	-.19	.31	.15 .01
21B. Technological Support		.24	.17	.24	.54'	.34	.31	-.26	.26	.14.29
ETS Score (Program Quality)	.11	.07	-.00	-.31	.12	.15	.13	.12	-.17	.40

N = 19 programs p<.05 -p<.01

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TABLE 12, continued

Program Variables by Academic Admin. Questionnaire Number (Appendix 5)	9	10	11	12	13	14	15	16	17	iSA
1. Number of Majors										
2A. Flight Course Class Size										
2B. Nonflight Course Class Size										
3. Provide Own Flight Training										
4. Number of Aircraft Utilized										
5. Number of Aircraft Owned										
6. Number of Aircraft Leased										

7A. Number of Full-time Faculty												
7B. Number of Part-time Faculty												
8. Entrance Requirements												
9. Graduation Requirements		1.00										
10. % of Internal Funding		.19	1.00									
11. % of State/External Funding	-19	-1.00"	1.00									
12. Airway Science Funding Now		.29		-.02	.02	1.00						
13. Past Airway Science Funding	.51'	.21	-.22	.33	1.00							
14. Teaching Workload	-.15	.15	-.15	.20	.03	1.00						
15. Number of Curricular Options	.04	-.06	.06	-.17	.12	.09	1.00					
16. Program Centrality	-.11	-.13	.13	-.39	.11	.00	.11	1.00				
17. Program Separate Department	-.01	.10	-.10	.03	.26	.03	.43	.46	1.00			
18A. Checkride Pass/Fail Rate-Private		-.02	.18	-.18	.42	-.22	-.29	-.43	-.11	-.05	1.00	
18B. Checkride Pass/Fail Rate-Commercial		.25	.38	-.38	.25	-.26	-.18	-.20	-.28	-.14	.87"	
18C. Checkride Pass/Fail Rate-Instrument		.16	.32	-.32	.38	-.30	-.06	-.15	-.13	-.06	.86"	
18D. Checkride Pass/Fail Rate-CFI		-.02	.13	-.13	.50	.12	-.50	-.13	.19	.24	.78"	
18E. Checkride Pass/Fail Rate-CFII		.25	.15	-.15	.38	.06	-.49	-.17	-.06	.07	.90"	
18F. Checkride Pass/Fail Rate-MEI		-.34	-.30	.30	.41	-.41	.18	.08	.61	.30	.37	
19. Suitable Office Space		.13	.48'	-.47'	.02	.29	.05	-.30	.26	.08	.10	
20. Comparable Faculty Salaries	.26	-.16	.17	-.18	-.15	.13	.26	-.09	-.47'	-.24		
21A. Financial Support		.21	-.11	.11	.03	.47'	-.02	-.21	.23	-.08	.09	
21B. Technological Support		.04	.09	-.10	-.09	.55'	-.19	.03	.27	-.10	.16	
ETS Score (Program Quality)	-.10	.04	-.04	.34	.44	.22	-.09	.38	.47'	.05		

N = 19 programs .p<.05 .p<.01

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TABLE 12, continued

Program Variables by Academic Admin. Questionnaire Number (Appendix 5)	18B	18C	18D	18E	18F	19	20	21A	21B	ETS Score
1. Number of Majors										
2A. Flight Course Class Size										
2B. Nonflight Course Class Size										
3. Provide Own Flight Training										
4. Number of Aircraft Utilized										
5. Number of Aircraft Owned										
6. Number of Aircraft Leased										
7A. Number of Full-time Faculty										
7B. Number of Part-time Faculty										
8. Entrance Requirements										
9. Graduation Requirements										
10. % of Internal Funding										
ii. % of State/External Funding										
12. Airway Science Funding Now										
13. Past Airway Science Funding										
14. Teaching Workload										
15. Number of Curricular Options										
16. Program Centrality										
17. Program Separate Department										

1 8A. Checkride Pass/Fail Rate-Private										
1 8B. Checkride Pass/Fail Rate-Commercial	1.00									
1 8C. Checkride Pass/Fail Rate-Instrument	.96"	1.00								
1 8D. Checkride Pass/Fail Rate-CFI	.53	.53	1.00							
18E. Checkride Pass/Fail Rate-CFII	.81"	.76"	.78"	1.00						
18F. Checkride Pass/Fail Rate-MEI	.23	.50	.31	.26	1.00					
19. Suitable Office Space	.14	.08	.09	.35	-.07	1.00				
20. Comparable Faculty Salaries	.06	.04	-.39	-.06	.08	.03	1.00			
21A. Financial Support	.08	-.00	.29	.15	-.31	.08	.05	1.00		
21B. Technological Support	.04	.04	.33	.41	.03	.46	.11	.37	1.00	
ETS Score (Program Quality)	-.16	-.05	.35	.14	.42	.40	-.07	.33	.34	1.00

N = 19 programs p<.05 ..p<.01

the pass rate is on both the FAA private pilot ($r = -.69, p < .05$) and FAA commercial pilot ($r = -.62, p < .05$) checkrides. Also, past airway science funding correlated significantly with the number of aircraft owned ($r = .49, p < .05$), financial support ($r = .47, p < .05$), and technological support ($r = .55, p < .05$). Further into the table, one notices the pass/fail rate on the FAA private checkride again showed a negative correlation when compared to number of aircraft owned by the aviation program ($r = -.63, p < .05$) and when compared to the number of full-time faculty members ($r = -.61, p < .05$). The negative correlation associated with number of full-time faculty and the FAA instrument checkride ($r = -.79, p < .01$) strengthened when examining the number of full-time faculty and the FAA commercial checkride ($r = -.81, p < .01$).

Additionally, the variable program is a separate department correlated negatively with comparable faculty salaries ($r = -.47, p < .05$), but positively with nonflight course class size ($r = .54, p < .05$), and number of full-time faculty ($r = .46, p < .05$). The pass/fail rate on the private checkride correlated significantly ($p < .01$) with the pass/fail rate on the commercial checkride ($r = .87$), instrument checkride ($r = .86$), certified flight instructor (CFI) checkride ($r = .78$), and CFI instrument checkride ($r = .90$). Finally, suitable office space correlated negatively with percent of state/external funding ($r = -.47, p < .05$) and positively with percent of internal funding ($r = .48, p < .05$). These intercorrelations reveal some interesting results.

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However, the overriding theme when examining Table 12 is most of the variables, primarily all input variables, do not correlate with the dependent variable program quality.

Phase Two Regression Analysis of Aviation Program Information

Using the information obtained in the correlational analysis of the academic administrator questionnaire, the only significant correlation was entered into a regression equation. This was done to determine the percent of variance in program quality accounted for by the variable "program is a separate department." Table 13 displays the results of the regression analysis. The results show that 22% ($A^2 = .22$) of the variance in phase two defined program quality is accounted for by the variable program is a separate department.

Table 13. Regression Analysis of Significant Indicator of Quality (Predictor) on Program Quality (Criterion)

Predictor Variable

Program is Separate

Department

N = 19 programs

.p <.05

Thus, these phase two results were geared toward answering whether the highest quality baccalaureate aviation programs are following current

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literature trends and emphasizing environment and outcome variables of quality. Further discussion of these phase two results along with a discussion of the phase one results is accomplished in the following chapter.

CHAPTER VI

DISCUSSION, CONCLUSIONS AND IMPLICATIONS

Through a two phased research design, an investigation of quality in **U.S. baccalaureate aviation programs produced results that addressed the** three research questions of the study. In phase one, the study provided results addressing which aviation programs are the highest quality and what the criteria were for the highest quality programs. Phase two provided results to determine whether the highest quality programs are emphasizing environment and outcome indicators of quality. In this chapter, the research results from both phases of the study will be discussed in regard to how thoroughly the research questions have been answered. Following the discussion, appropriate conclusions regarding U.S. baccalaureate aviation program quality are made, and some implications for further research are addressed.

Discussion of Phase One Results and Analysis

In regard to determining which U.S. baccalaureate aviation programs are the highest quality, the results obtained from the phase one questionnaire were

helpful in answering this question. The mean ratings, on a i-to-5 scale, along with the provision that each expert list the top ten

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programs, allowed the experts to become familiar with the names of all U.S. baccalaureate aviation programs prior to ranking the programs. Thus, the rankings should be more valid than if all the programs were not listed on the questionnaire. However, two baccalaureate aviation programs, identified by a few experts as being in the top ten, were not listed on the questionnaire. The two programs were Moody Bible Institute in Tennessee and LeTourneau University in Texas. These two programs were not included on the phase one questionnaire because they were not listed in the *Collegiate Aviation Directory* (UAA, 1994) as offering flight education with a baccalaureate degree. After reviewing the phase one rankings, a check on whether these program should have been included verified that their ranking was appropriate. Therefore, the two programs were included in phase two of the study.

Highest Quality Programs

The data obtained in phase one seemed to provide a clear picture of which programs are the highest quality. In testing for significant differences in the mean quality rating data, it was found that academic administrators and aviation industry experts have similar opinions as to the quality of the vast majority of rated U.S. baccalaureate aviation programs. Of the 39 programs that could be tested, only three were rated significantly different by the experts. The three aviation programs identified as having significant differences among groups of experts may want to investigate possible

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reasons for these differences. In all three cases the industry ratings were lower than the academic administrator ratings.

Although the mean quality ratings and the top ten rankings did not entirely agree on which programs should be included in the top ten, eight of the aviation programs appeared in the top ten for the quantitative and qualitative data. The programs were the top eight ranked aviation programs when the data sets were combined. These top eight programs were (1) University of North Dakota, (2) Purdue, (3) Ohio State University, (4) EmbryRiddle Aeronautical University-

Daytona, (5) Parks College/St. Louis University, (6) Daniel Webster College, (7-Tie) Southern Illinois University at Carbondale, and also (7-Tie) Embry-Riddle Aeronautical University-Prescott. The other four programs ranked or rated in the top ten were Central Missouri State University, Western Michigan University, Dowling College, and Moody Bible Institute. To say that these 12 programs are the only high quality baccalaureate aviation programs would not be true. What the phase one research attempted to accomplish was to focus on those programs considered by experts to be the highest quality programs, and identify criteria that are indicators of quality, so all aviation programs could focus more attention on these indicators of quality. The criteria, after being scrutinized through Glaser and Strauss' grounded theory constant comparative analysis, formed the basis for a model of what program quality is within the specific context of U.S. baccalaureate aviation programs.

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Development of a Model of Program Quality in U.S. Baccalaureate Aviation Programs

The quality criteria listed by the experts in phase one, formed the ten categories for the development of a model that depicts the make-up of program quality in U.S. baccalaureate aviation programs. Figure 1 displays the model with the ten criteria categories that were reported in Chapter IV. The diameter of the circle for each category of the model represents the approximate percentage of experts mentioning criteria within each indicator of quality category.

The ten indicators of quality within the model resemble other academic program quality studies to some extent. For example, Mijares' (1988) study of criminal justice programs found similar indicators, or factors, leading to a reputation of program excellence. The similar factors were curriculum, faculty, resources and facilities, and students. Also, Mijares' study identified size as a separate factor, whereas in this study, it was associated with students, similar to Conrad and Blackburn's (1985) study. However, other factors identified in the Mijares study, dissimilar to this study, were public service, association activity, graduate school, and age. Reasons for these differences may be numerous, but could include the fact that criminal justice programs emerged prior to a majority of aviation programs. Additionally, when considering these dissimilar factors, it is interesting to note that even in two relative new professional academic

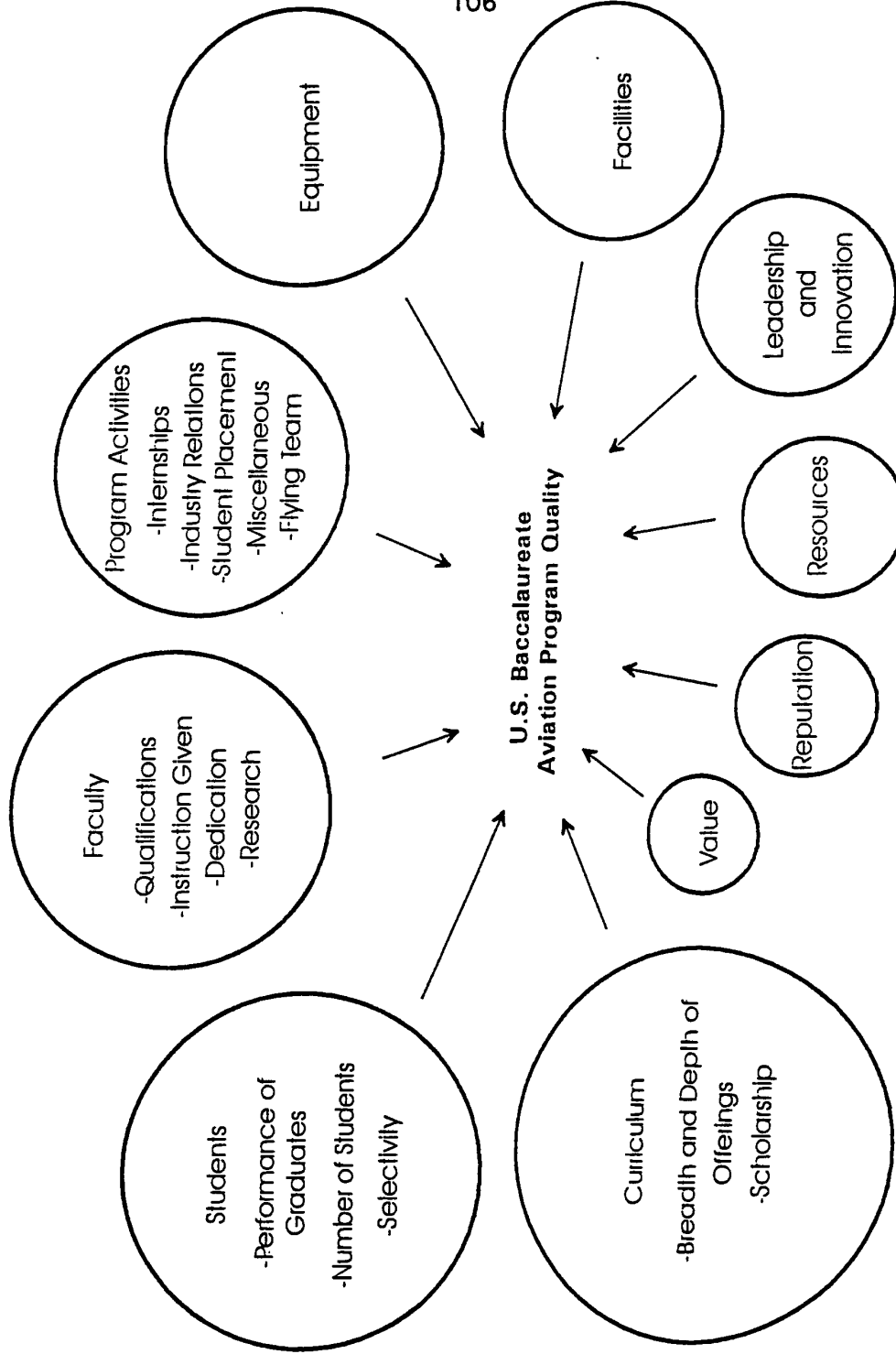


Figure 1. Model of Program Quality in U.S. Baccalaureate Aviation Programs

programs such as criminal justice and aviation, academic program quality is defined differently. This does support Conrad and Pratt's (1985) research suggesting program quality be defined within a specific context. The results also support one of Fairweather and Brown's (1991) perspectives on academic program quality, that academic program quality is dependent upon departmental or program variables and not institutional variables. For example, most of the indicators of quality defined in the model of program quality in U.S. baccalaureate aviation programs pertain to specific departmental characteristics and not institutional characteristics.

Multi-dimensional Nature of Baccalaureate Aviation Program Quality

The criteria for program quality data obtained in phase one were certainly multi-dimensional in nature, given the frequency different criteria were listed by the aviation education and aviation industry experts. Granted, the criteria listed by aviation industry experts were not as extensive as criteria listed by the academic administrators. However, the emphasis the industry placed on the performance of aviation program graduates is understandable, since it is a critical element in the airline's day-to-day operation. Having well-educated aviation professionals readily able to meet the high pressure demands of the airline industry is essential for the continued success of the company. Thus, the perception by the airline industry that the performance of graduates is the overriding and predominant indicator of quality appears to be well founded.

It was interesting to note that the criteria used by the experts paid little attention to the reputation of the baccalaureate aviation programs, a variable often criticized in the past for having too much emphasis in academic program quality studies. The differences between academic administrators and industry though, do suggest that academic administrators should possibly be focusing more attention on what happens to their graduates within the aviation industry in order to monitor where changes in their particular aviation program need to be made.

Some bias in the phase one quality criteria data may be present, since the regional airline directors of operations/training were not as familiar with as many of the baccalaureate aviation programs as the academic administrators. When it came to ranking programs, the regional airline directors could only rank programs that they knew about, and those programs tended to be programs located nearby. However, the bias was counteracted by the fact that among the FAA regions of the country from which the regional airline experts were selected, the response rates from each region were

similar. Thus, the regional bias factor should have cancelled itself out with similar response rates from all regions.

A discussion of which criteria or indicators of quality identified in phase one are most important is warranted. Through an examination of Figure 1, it is appropriate to state that the phase one experts listed the curriculum category most frequently as a criteria for quality. Using this qualitative data, curriculum would be listed as the most important indicator

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of quality followed by students, faculty, program activities, equipment, facilities, leadership, resources, reputation, and value. These criteria categories, or indicators of quality, all play a part in how the aviation education and aviation industry experts view quality.

The phase one analysis went a step further and provided quantitative analysis to the data collected. This analysis revealed that each of the indicators of quality correlated significantly ($p < .01$) with the dependent variable program quality (measured by the frequency a program was ranked in the top ten). In addition, these correlations were rather high, ranging from .93 (faculty and curriculum) to .66 (leadership and value). Intercorrelations between these ten variables were also high and all but one were significant at the $p < .01$ level. Thus, to determine which variables account for more of the variance in program quality a regression analysis was accomplished using a preset order for entering each variable. The analysis showed that the variable curriculum accounted for approximately 86 percent of the variance in program quality. The other variable accounting for a significant amount of variance was faculty (5 percent). These two variables accounted for 91 % of the variance in program quality and therefore could be considered predictors of U.S. baccalaureate aviation program quality. To investigate why other variables were not predictors, an additional regression equation with all variables entered showed much lower or even negative final beta coefficients for these variables as compared to the predictor variables. They had little or no effect on program quality while controlling for the other variables in the

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equation. Thus, curriculum and faculty are the best predictors of program quality in phase one. It should be mentioned though that the data set used to arrive at this conclusion is not ideal. The number of independent variables in the regression equation, two in this case, possibly warrants a higher number of programs to be included as units of analysis. In this particular data set only 22 programs were used since that was the number of programs listed at least twice in the top ten rankings. The conclusions drawn from the regression equation should be verified through a larger sample of programs.

Phase two of the research study examined to what extent U.S. baccalaureate

aviation programs are following current literature trends and emphasizing environment and outcome indicators of quality. It provided an alternative view of academic program quality through the lens of three ETS self-assessment instruments. It also provided a methodology that could possibly verify the results obtained in phase one. For example, if the highest quality programs rated an ETS indicator of quality scale higher than the intermediate and low quality programs, it would support the top ten rankings of those programs. These comparisons as well as a discussion of the results of phase two are provided in the next section.

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Discussion of Phase Two Results and Analysis

Similar Emphasis on Environment and Outcome Indicators of Quality

Phase two focused on the environment and outcomes of U.S. baccalaureate aviation programs. All of the ETS instrument scales examined environment and outcome variables to some extent except for the available resources scale. The environment and outcomes of a baccalaureate aviation program are very important when measured by the ETS indicators of quality scales. In examining the mean scores by students, faculty, and alumni for each indicator of quality scale, as well as the totaled average student, faculty, and alumni mean score, several intermediate quality program means were higher than the high quality programs. Some of the low quality program means were also higher than the high quality program means. But why did this happen? Does the phase two data invalidate the phase one data? The reason for the different results is because program quality was measured in another way in phase two. When comparing group means the phase two results show that the highest quality aviation programs do not emphasize environment and outcome variables as indicators of quality, at least to no greater extent than the intermediate and low quality programs. And, in a few cases, the highest quality programs actually emphasize environment and outcome variables to a lesser extent.

However, to show that the differences are not very extensive among students, faculty, and alumni at the three groups of U.S. baccalaureate aviation programs (high, medium, and low), additional comparisons were

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made. For example, among students, only five of the eleven applicable ETS indicators of quality scales showed significant differences between high, medium, and low quality program groups. Only two of these scales, available resources and internships, showed significant differences between students in the highest quality programs compared to students in both the medium quality programs and low quality programs. The internship scale measures an environment variable whereas the available resources scale is an input variable. On the other hand,

the environment for learning and the student accomplishment scales were rated significantly higher by the intermediate quality group over the high quality group. Furthermore, although not significantly higher, the rated mean for these scales by the low quality group were also higher than the high quality group of aviation programs. The last significantly different rating in the student sample was on the scale resource accessibility. The medium quality program group rated it significantly higher than the low quality program group. Thus, only one of the eleven student ETS indicators of quality scales measuring environment or outcome variables was rated significantly higher by the highest quality programs. According to the students, it could be concluded that the highest quality baccalaureate aviation programs are not emphasizing environment and outcome variables that are indicators of quality to any greater extent than intermediate or low quality aviation programs.

The survey of faculty from high quality, medium quality, and low quality programs found ten of the eleven indicators of quality scales had no

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significant differences between groups. The only significant difference appeared in the environment for learning scale. The intermediate quality program faculty rated their environment for learning significantly higher than the high quality program faculty. The low quality program faculty also rated this scale higher than the high quality program faculty, although not significantly. So, these results overwhelmingly state that according to the faculty, the highest quality programs are not emphasizing environment and outcome variables of indicators of quality to any greater extent than the intermediate or low quality program.

When examining the results from the alumni sample, the conclusions are similar to the student data. Of the ten applicable ETS instrument indicators of quality scales, only two were found to have significant differences between alumni groups. These scales were available resources and internships. The available resources scale, an input variable scale, was rated significantly higher by the high quality program alumni as compared to both the medium quality and low quality program alumni. Similar to the student ratings, the internship scale was rated significantly higher by the high quality program alumni as compared to the low quality program alumni. Although the medium quality program alumni's mean rating on this scale was also lower than the high quality program alumni, it was not significant. Thus, just like the student category, the only indicator of quality scale rated significantly higher by the high quality programs that measures environment or outcome variables was the internship scale.

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It could be surmised then, that the highest quality U.S. baccalaureate aviation programs do not emphasize environment and outcome indicators of

quality to any greater extent than intermediate and low quality aviation programs. The correlational analysis between the phase one expert ratings and the 16 indicators of quality scores obtained in phase two supports this statement since only one of the 16 indicators correlated significantly with program quality, and it correlated negatively. The only area where more emphasis is placed by the highest quality programs on environment or outcome indicators of quality is the area of internship experiences. This emphasis should be maintained at the highest quality programs and the other programs should try to increase emphasis in this area since the aviation industry experts placed a great deal of importance on performance of graduates, and generally speaking, these graduates had come from baccalaureate aviation programs with very active internship programs.

Reasons why the phase two ANOVA analyses did not lend support to the phase one findings may stem from the fact that the programs experts rated the lowest tended to be smaller programs. The student-faculty ratios at these smaller programs were generally much lower than the more highly rated quality programs. Thus the interaction level between students and faculty at the low quality programs would be higher than the student-faculty interaction level at the high quality programs. Because of this higher interaction, students at low quality programs may have rated the ETS indicator of quality scales--such as environment for learning and faculty

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concerns for students--at a higher level than students attending medium and higher rated programs.

Another reason why the phase two ANOVA analyses did not lend significant support to the phase one analyses may include a limitation mentioned in Chapter I. Perceptions of program quality may have differed among high, medium, and low quality program students, faculty, and alumni. Possible differences in perceptions could be accounted for by the expectation levels of the students, faculty, and alumni at the high, medium, and low quality programs. For example, it is possible that students attending low quality programs may not have expected as much from the aviation program they attended as compared to students who attended high quality programs. As a result, students who had low expectations attending low quality programs may have rated the ETS indicator of quality scales just as high or higher than students with high expectations attending high quality programs. This anticipation factor could account for why there were not many significant differences among students, faculty, and alumni from high, medium, and low quality programs in phase two.

Does Emphasis on Input and Organizational Indicators of Quality Correlate with Program Quality?

The results of the phase two correlational analysis of the academic administrator questionnaire with program quality support a view that baccalaureate aviation programs can be of high quality by emphasizing environment and outcome indicators of program quality, even though the

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program may not have desired input variables such as a large number of aviation majors and a large number of aircraft. This summation is supported by the fact that only one of 29 primarily input variables correlated significantly with program quality. All of the 29 variables, except for FAA pass/fail rates and graduation requirements, were either input or organizational variables. It is clear from the correlational analysis that emphasizing only input and organizational variables does not guarantee a high quality program, especially when emphasis on environment or outcome variables is measured. Examining all variables of a baccalaureate aviation program (inputs, organizational, environment, and outcome) and identifying the variables that are indicators of quality is essential to continually improve the aviation program.

Predicting U.S. Baccalaureate Aviation Program Quality

The phase two regression analysis of the one variable that correlated significantly with program quality indicated that “program is a separate department” can predict program quality, accounting for 22% of its variance. However, one must temper this result with the fact program quality was measured by one particular set of instruments, even though input was received from students, faculty, and alumni. The reason for differences in correlates of program quality from phase one and phase two lies in the different way program quality was measured. For example, the phase one criteria for program quality, given by the experts, only received minimum

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mention of the type of instruction given, a major emphasis in the phase two instruments. Thus, the predictors of program quality arrived at in this study varied when program quality was measured in different ways.

Conclusions and Implications

Four concluding statements emerge from the results and discussion of this two-phased research study. First, the phase one identified experts from aviation education and aviation industry generally agree that a few baccalaureate aviation programs in the U.S. are of the highest quality. There were a minimal number of significant differences among the three groups of experts when rating all 70 aviation programs. Eight of the baccalaureate aviation programs were ranked in the top ten in both the quantitative and qualitative rankings.

Second, the criteria the phase one experts used to base their rankings upon was multi-dimensional in nature. Industry mainly focused on student outcomes as an indicator of quality while the academic administrators focused on environment and input variables such as curriculum, faculty, students and program activities.

The third main conclusion emerged from phase two of the research study. Even though aviation education experts generally agreed on which programs were of highest quality, most of the environment and outcome indicators of quality were not emphasized to a greater extent at the highest quality programs when compared to the intermediate and lower quality

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programs. The only environment indicator of quality emphasized to a greater extent at the highest quality aviation programs was internship experiences.

Finally, the fourth major concluding statement is that when program quality is measured through environment and outcomes variables of academic programs, many of the common input and organizational variables of U.S. baccalaureate aviation programs do not correlate significantly with program quality. In the phase two research, only one of 29 primarily input and organizational variables correlated significantly with program quality, supporting a belief that an aviation student may receive a comparably high quality education at a phase one identified intermediate or low quality baccalaureate aviation program. However, this does not change the fact that the aviation education and aviation industry experts view a quality baccalaureate aviation program through a model developed from the phase one criteria. Those criteria, or indicators of quality, included environment variables such as internship experiences, faculty dedication, and student development opportunities. So although the highest quality programs do not place greater emphasis on most of the ETS instrument environment and outcome variables, they are not concentrating totally on phase one identified input and organizational indicators of quality.

The implications of this research study verify that program quality is multi-dimensional in nature, similar to Conrad and Blackburn's (1985) study of graduate programs and congruent with one of Fairweather and Brown's (1991) perspectives on quality. Identifying the indicators of U.S.

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baccalaureate aviation program quality in this study supports the premise that the indicators contain input, organizational, environment, and outcome variables. Although the phase one experts did not provide supportive data that aviation program quality is primarily defined through environment and outcome variables, it is evident from the criteria obtained in phase one that a shift toward these areas has occurred in baccalaureate aviation programs. This shift also may be occurring in other professional education programs. Researching other professional academic programs to validate the results of this study including two year aviation programs, would be beneficial.

The information produced as a result of phase one should not be considered conclusive in nature. Since this is the first attempt at identifying indicators of quality in U.S. baccalaureate aviation programs, further research is needed to compliment the phase one study. Additionally, a more comprehensive review of a greater number of U.S. baccalaureate aviation programs would also prove helpful in providing supportive data as to which indicators of quality should garner the most attention when providing the highest quality baccalaureate aviation education.

Thus, this research study has provided the answers to three important research questions pertaining to professional baccalaureate aviation programs. The highest quality U.S. baccalaureate aviation programs have been identified and a model for baccalaureate aviation program quality as been developed. Also, emphasis on environment and outcome indicators of quality has been found to be similar among U.S. baccalaureate aviation

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programs. Progress has been made in providing further definition of program quality, albeit in a specific context. Continually improving higher education's academic programs by offering more comprehensive definitions of academic program quality seems essential to progressively pursue the never ending search for new knowledge and ongoing verification of current knowledge in higher education.

APPENDICES

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APPENDIX A

**U.S. BACCALAUREATE AVIATION PROGRAMS WITH FLIGHT EDUCATION
(The year the aviation program was established is listed, if known)**

Alabama

Auburn University 1 942

Alaska

University of Alaska-Anchorage 1 971 **Arizona**

Arizona State University 1951

Embry-Riddle-Prescott 1 978 **Arkansas**

Henderson State University 1 972 **California**

California State University 1 978

Christian Heritage College 1971

San Jose State University 1 942 **Colorado**

Metropolitan State College (Denver)

1970

Connecticut

University of New Haven 1 975 **Delaware**

Delaware State College

Wilmington College 1 968

District of Columbia

University of the District of Columbia **Florida**

Embry-Riddle Daytona 1 926

Florida Institute of Technology 1 967

Florida Memorial College 1 985

Jacksonville University 1 983

Lynn University 1984 **Illinois**

Lewis University 1 932

Parks College of St. Louis University
1927

Southern Illinois at Carbondale 1965 **Indiana**

Indiana State University 1 968

Purdue University 1 955

Iowa

University of Dubuque 1 973 **Kentucky**

Eastern Kentucky University 1 983

Louisiana

Louisiana Tech University 1968

Northeast Louisiana University 1 939

Northwestern State University **Maryland**

University of Maryland-Eastern Shore
1988

Massachusetts

Bridgewater State College

Michigan

Andrews University

Western Michigan University 1 939 **Minnesota**

Mankato State University 1 968

St. Cloud State University 1987

Winona State University 1 973 **Mississippi**

Delta State University 1981 **Missouri**

Central Missouri State University
1968

College of the Ozarks

Montana

Rocky Mountain College 1 988 **Nebraska**

Grace College of the Bible 1 987

Univ. of Nebraska at Kearney

Univ. of Nebraska at Omaha 1990 **New Hampshire**

Daniel Webster College 1 965 **New York**

Dowling College 1968

St. Francis College 1982

North Carolina

Elizabeth City State University 1 986 **North Dakota**

University of North Dakota 1 968 **Ohio**

Bowling Green State University 1 982

Kent State University 1 965

Ohio State University 1942

Ohio University 1988

Oklahoma

Oklahoma State University
 Southern Nazarene University
 University of Oklahoma 1 947

South Dakota

Augustana College

Tennessee

Middle Tennessee State University
 1971
 Tennessee State University 1965

Texas

Texas Southern University 1987 University of Central Texas 1973

Utah

Utah State University 1 936

Virginia

Averett College 1 980
 Hampton University 1985
 Liberty University 1 972
 Norfolk State University 1 992

Washington

Central Washington University 1972 Walla Walla College

West Virginia

College of West Virginia 1 991
 Salem-Teikyo University
 West Liberty State College 1 989

Wisconsin

Concordia College

the Major and National Directors of Operations/Training from

Alaska Airlines, Inc.

Aloha Airlines, Inc.

American Airlines, Inc.

American Trans Air, Inc.

America West Airlines, Inc.

Continental Airlines Inc.

Delta Air Lines, Inc.

Hawaiian Airlines, Inc.

Horizon Air Industries Inc.
Airlines

following Major/National Airlines

Markair, Inc.

Midwest Express Airlines, Inc.

Northwest Airlines, Inc.

Southwest Airlines Co.

Tower Air, Inc.

Trans World Airlines, Inc.

United Airlines

USAir

Westair Commuter Airlines

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APPENDIX B

AVIATION INDUSTRY EXPERTS

Federal Aviation Administration
Aviation Standards Eastern Region Headquarters
Associate Administrator Regional Administrator
Office of Aviation System Standards Great Lakes Region Headquarters
Associate Administrator Regional Administrator
Regulation and Certification New England Region Headquarters
Associate Administrator Regional Administrator
Airway Facilities Northwest Mountain Region Headquarters
Associate Administrator Regional Administrator
Air Traffic Southern Region Headquarters
Associate Administrator Regional Administrator
Mike Monroney Aeronautical Center Southwest Region Headquarters
Associate Administrator Regional Administrator
Alaskan Region Headquarters Western-Pacific Region Headquarters
Regional Administrator Regional Administrator
Central Region Headquarters FAA Technical Center

Regional Administrator

Director, FAA Technical Center

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APPENDIX B, con't.

Regional Carriers

Directors of Operations/Training from the Following Regional Carriers

Alaskan Region

Alaska Juneau Aeronautics
Baker Aviation, Inc.
Barrow Air Inc.
Bellair, Inc.
Bering Air
Cape Smythe Air Service, Inc.
ERA Aviation
40 Mile Air
Frontier Flying Service, Inc.
Haines Airways
Inlet Airlines
Ketchikan Air Service, Inc.
Lab Flying Service, Inc.
Larry's Flying Service, Inc.
Loken Aviation, Inc.
Markair Express
Olson Air Service, Inc.
Peninsula Airways, Inc.
Reeve Aleutian Airways, Inc.
Ryan Air Service, Inc.
Skagway Air Service Inc.
Southcentral Air, Inc.
Tanana Air Service
Village Aviation, Inc.
Wilbur's Inc.
Wright Air Service Inc.
Yute Air Alaska Inc.

Central Region

GP Express Airlines, Inc.
Great Lakes Airlines
Redwing Airways, Inc.
Ryan International Airlines
Trans State Airlines **Eastern Region**
American Dream Airlines, Inc.
Antillas Air
Atlantic Coast Airlines
Baltia Air Lines, Inc.
Capitol Air Express

Chautauqua Airlines, Inc.
Christman Air System
Commutair
Crown Airways, Inc.
East Coast Aviation Services Ltd.
Eastwind
Jet Express
KIWI International Air Lines, Inc.
Pennsylvania Aviation, Inc.
Pennsyl. Commuter Airlines, Inc.
Piedmont Airlines Inc.
Trans World Express, Inc.
U.S.-Africa Airways Inc.
Westates Airlines, Inc.
Worldwide Airlines Services, Inc.

Great Lakes Region

Air Alpha
Air Vantage, Inc.
Air Wisconsin
Bemidji Aviation Services Inc.
Comair Inc.
Direct Air, Inc.
GCS Air Service
Jetstream International Airlines
Mesaba Aviation, Inc.
Spirit Airlines, Inc.
Trans North Aviation, Ltd.

New England Region

Air Cape
Atlantic North Airlines
Business Express, Inc.
Cape Air
Gulfstream Airlines, Inc.
JIB, Inc.
New England Airlines, Inc.
Northeast Exp. Reg. Airlines, Inc.
Precision Valley Aviation, Inc.

Northwest Mountain Region

Alpine Aviation, Inc.
Big Sky Transportation Co.
Empire Airlines, Inc.
Harbor Airlines Inc.
Kenmore Air Harbor, Inc.
Lake Union Air Service Inc.
Morris Air
Rocky Mountain Airways, Inc.

Skywest Airlines
West Isle Air

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Southern Region
Airline of the Virgin Islands, Ltd
Air Sunshine, Inc. Flight Trails
Airways International, Inc. Grand Airways, Inc.
Arrow Air, Inc. Grand Canyon Airlines, Inc.
Atlantic Southeast Airlines, Inc. Great Western Air Inc.
Atlantic World Airways, Inc. International Air Carriers, Ltd.
Aviation Associates, Inc. Las Vegas Airlines
Carnival Air Lines Pacific Coast Airlines
CCAir, Inc. Reno Air, Inc.
Coastal Air Transport Renown Aviation, Inc.
Executive Air Charter Scenic Airlines, Inc.
Express Airlines I, Inc. Soma Aviation, Inc.
Federal Airlines, Inc. Statewest Airlines
Flagship Airlines Trans Air
Flamenco Airways Inc. Western Airlines, Inc.
Florida Air
Four Star Aviation, Inc.
Paradise Island Airlines
Rich International Airways, Inc.
Skybus, Inc.
Southeastern Air Lines
Sun Express Airlines
Vieques Air Link, Inc.
Virgin Air Inc.
Walker's International
WRA Airlines

Southwest Region
Britt Airways
Conquest Airlines
Exec Express II, Inc.
Mesa Airlines, Inc.
Metro Airlines, Inc.
Ross Aviation, Inc.
Simmons Airlines, Inc.
Ultrair, Inc.

Western-Pacific Region
Air L.A.
Air Micronesia, Inc.
Air Molokai, Inc.
Air Nevada Airlines, Inc.
Airplanes, Inc.

Air Sedona
Air Vegas
Aloha Islandair, Inc.
Alpha Aviation, Inc.
American Eagle
Aviation Services LTD.
Casino Express Airlines

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APPENDIX C

DESCRIPTION OF COMPOSITE INDICATORS OF PROGRAM QUALITY

The sixteen composite indicators of program quality that the Educational Testing Service instruments address are (adapted from Clark, 1983):

1. *Environment for Learning.* The extent to which the department provides a supportive environment characterized by mutual respect and concern between students and professors, students' helpfulness to one another, and departmental openness to new ideas and different points of view.
2. *Scholarly Excellence.* Rated excellence of the department faculty, ability of students, and intellectual stimulation in the program, including problem solving and critical thinking abilities.
3. *Quality of Teaching.* Faculty excitement for new ideas and helpfulness in dealing with class work; student evaluation of faculty teaching methods, grading procedures, and preparation for class.
4. *Faculty Concern for Students.* The extent to which faculty members are perceived to be interested in the welfare and professional development of students, accessible, and aware of student needs, concerns, and suggestions.
5. *Curriculum.* Ratings of the variety and depth of course and program offerings, program flexibility, opportunities for individual projects, and interactions with related departments.
6. *Departmental Procedures.* Ratings of departmental policies and procedures such as the relevance and administration of degree requirements, evaluation of student progress toward the degree, academic advisement of students, and helpfulness to graduates in finding appropriate employment.
7. *Available Resources.* Ratings of available facilities such as libraries, laboratories, airport facilities, aircraft, simulators, computers, and overall adequacy of physical

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and financial resources for the aviation program.

8. *Student Satisfaction with Program.* Self-reported student satisfaction with the program as reflected in judgments about the amount that has been learned, preparation for intended career, desire to transfer, and willingness to recommend the program to a friend.
9. *Internship or Fieldwork Experiences including flight instructor experiences.* Ratings of preparation for and supervision of assigned duties; contribution of the experiences to academic and professional development.
10. *Resource Accessibility.* Self-reported student satisfaction with opportunities for intellectual and social interaction among persons in the program, with student services and financial assistance, and with campus services for nonresident students.
11. *Employment Assistance.* Alumni assessment of the employment assistance received through the department's formal or informal efforts, individual professors, placement office, listings of openings from professional associations, and unsolicited letters sent to employers.
12. *Faculty Work Environment.* Self-reported faculty satisfaction with departmental objectives and procedures, academic freedom, opportunities to influence decisions, and relationships with other faculty members; sense of conflicting demands and personal strain.
13. *Faculty Program Involvement.* Extent to which faculty members report involvement in the program: teaching required courses, participating in policy and curriculum decisions and departmental examinations, directing

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independent studies, supervising field work or internships, serving as a faculty adviser, and arranging student contacts with nonacademic professionals.

14. *Faculty Research Activities.* The extent to which faculty members report receiving awards for outstanding research or scholarly writing, editing professional journals, refereeing articles submitted to professional journals, and receiving grants to support research or other scholarly or creative work.
15. *Faculty Professional Activities.* The extent to which faculty members report serving on national review or advisory councils, holding office in regional or national professional association, and receiving awards for outstanding teaching or professional practices.
16. *Student Accomplishments.* Self-reported student accomplishments in several categories of activity and recognition, including attendance and

presentations at professional meetings, writing of scholarly papers, planning and involvement in research projects; development of professional skills and knowledge; recognition through prizes, awards, fellowships, training grants, or scholarships; and participation in department or program planning.

APPENDIX D
PHASE ONE QUESTIONNAIRE SENT TO
AVIATION INDUSTRY/AVIATION EDUCATION EXPERTS

Please rate the baccalaureate aviation program located at each of the following U.S. academic institutions according to its quality. The list includes only those baccalaureate aviation programs that offer flight education in conjunction with aviation related degrees. A scale of 1 to 5 is provided with a 5 representing the highest quality programs and a 1 representing lowest quality programs. If you don't know anything about an institution's program, please place an X in the "don't know" column. The reasons for rating low quality programs is to determine if there are significant characteristic differences between those programs and the higher quality programs. The ratings you provide will be kept in strict confidence and will only be reported as grouped data.

	lowest quality			highest quality	Don't know
Alabama					
Auburn University	1	2	3	4	5
Alaska					
University of Alaska-Anchorage	1	2	3	4	5
Arizona					
Arizona State University	1	2	3	4	5
Embry-Riddle-Prescott	1	2	3	4	5
Arkansas					
Henderson State University	1	2	3	4	5
California					
California State University	1	2	3	4	5
Christian Heritage College	1	2	3	4	5
San Jose State University	1	2	3	4	5
Colorado					
Metropolitan State College (Denver)	1	2	3	4	5
Connecticut					
University of New Haven	1	2	3	4	5

Delaware					
Delaware State College	1	2	3	4	5
Wilmington College	1	2	3	4	5
District of Columbia					
University of the District of Columbia	1	2	3	4	5
Florida					
Embry-Riddle Daytona	1	2	3	4	5
Florida Institute of Technology	1	2	3	4	5
Florida Memorial College	1	2	3	4	5
Jacksonville University	1	2	3	4	5
Lynn University	1	2	3	4	5
Illinois					
Lewis University	1	2	3	4	5
Parks College of St. Louis University	1	2	3	4	5
Southern Illinois at Carbondale	1	2	3	4	5

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	lowest quality			highest quality		Don't know
Indiana						
Indiana State University	1	2	3	4	5	—
Purdue University	1	2	3	4	5	—
Iowa						
University of Dubuque	1	2	3	4	5	
Kentucky						
Eastern Kentucky University	1	2	3	4	5	—
Louisiana						
Louisiana Tech University	1	2	3	4	5	—
Northeast Louisiana University	1	2	3	4	5	—
Northwestern State University	1	2	3	4	5	—
Maryland						
University of Maryland-Eastern Shore	1	2	3	4	5	—
Massachusetts						
Bridgewater State College	1	2	3	4	5	—
Michigan						
Andrews University	1	2	3	4	5	—
Western Michigan University	1	2	3	4	5	—
Minnesota						
Mankato State University	1	2	3	4	5	—
St. Cloud State University	1	2	3	4	5	—
Winona State University	1	2	3	4	5	—
Mississippi						
Delta State University	1	2	3	4	5	—
Missouri						
Central Missouri State University	1	2	3	4	5	—
College of the Ozarks	1	2	3	4	5	—
Montana						

Rocky Mountain College	1	2	3	4	5	
Nebraska						
Grace College of the Bible	1	2	3	4	5	—
Univ. of Nebraska at Kearney	1	2	3	4	5	—
Univ. of Nebraska at Omaha	1	2	3	4	5	—
New Hampshire						
Daniel Webster College	1	2	3	4	5	—
New York						
Dowling College	1	2	3	4	5	—
St. Francis College	1	2	3	4	5	—
North Carolina						
Elizabeth City State University	1	2	3	4	5	
North Dakota						
University of North Dakota	1	2	3	4	5	—

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	lowest quality		highest quality		Don't know
Ohio					
Bowling Green State University	1	2	3	4	5
Kent State University	1	2	3	4	5
Ohio State University	1	2	3	4	5
Ohio University	1	2	3	4	5
Oklahoma					
Oklahoma State University	1	2	3	4	5
Southern Nazarene University	1	2	3	4	5
University of Oklahoma	1	2	3	4	5
South Dakota					
Augustana College	1	2	3	4	5
Tennessee					
Middle Tennessee State University	1	2	3	4	5
Tennessee State University	1	2	3	4	5
Texas					
Texas Southern University	1	2	3	4	5
University of Central Texas	1	2	3	4	5
Utah					
Utah State University	1	2	3	4	5
Virginia					
Averett College	1	2	3	4	5
Hampton University	1	2	3	4	5
Liberty University	1	2	3	4	5
Norfolk State University	1	2	3	4	5
Washington					
Central Washington University	1	2	3	4	5
Walla Walla College	1	2	3	4	5
West Virginia					
College of West Virginia	1	2	3	4	5

Salem-Teikyo University	1	2	3	4	5
West Liberty State College	1	2	3	4	5
Wisconsin Concordia College	1	2	3	4	5

Other U.S. baccalaureate aviation programs
offering flight education

1	2	3	4	5
1	2	3	4	5

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Now that you have rated each of the programs, please list in order of their excellence, the ten programs you believe are the highest quality programs. Write the criteria used to make this determination. List as many criteria as possible (up to 6) for each of the highest quality programs, starting with the most important criterion first.

Thank you for your time and cooperation. The information you provide will be kept in strict confidence and only be reported as grouped data.

1.

List criteria for #1 program below

2.

3.

4.

List criteria for #2 program below

List criteria for #3 program below

List criteria for program #4 below

5.

List criteria for program #5 below

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6.

7.

8.

9.

List criteria for program #6 below

List criteria for program #7 below

List criteria for program #8 below

List criteria for program #9 below

List criteria for program #10 below

Institutions

If you have a degree from any post secondary institution, please list your degree(s) and the institution(s) you attended or graduated from:

Degree/Degrees

Thanks again for your time and cooperation. It is greatly appreciated!

APPENDIX E

COVER LETTER ACCOMPANYING PHASE ONE QUESTIONNAIRE

Dear Aviation Industry/Aviation Education Expert:

For the past twenty years I have been a member of the professional aviation community. For the past three years I have been pursuing a Ph.D. from the University of Michigan.

My dissertation research addresses the quality of the leading four-year aviation education programs. Through input from aviation industry and aviation education experts like yourself, I am attempting to identify the highest quality baccalaureate aviation programs in the United States. In addition, I would like to know the reasons for their success as judged by experts.

The overall aim of the study is to promote higher academic program quality in U.S. baccalaureate aviation programs and possibly other professional undergraduate programs as well. The results of this study will allow aviation education administrators

to evaluate their own programs for necessary alterations. The results also should benefit aviation program accreditors in evaluating present accreditation standards and aid potential students in making decisions concerning enrollment based on specific qualities of these schools. Since you are one of only a select number of aviation experts being asked to participate, your personal cooperation is most important to the success of this study.

All replies to the enclosed questionnaire will be kept confidential and no respondent will be identified in the study or elsewhere by name or position. Participation in this study is voluntary; and individual questions may be skipped. Furthermore, institutions receiving low quality scores will not be identified. Only group characteristics of these institutions will be reported. The identification number on the questionnaire is solely for any follow-up correspondence. Questionnaires will be destroyed upon completion of the study. By returning the enclosed questionnaire, you are consenting to participate in this study and allowing the information you provide to be reported as group data.

Please indicate on the questionnaire if you wish to receive a summary of the results. A stamped/addressed envelope is enclosed.

Thank you very much.

Sincerely,

Paul D. Lindseth
Doctoral Student
University of Michigan

APPENDIX F

PHASE ONE FOLLOW-UP POST CARD



Don't be left out -- your expert comments are valuable in making the research study on aviation education quality a success! Please return the completed questionnaire at your earliest convenience. In the event you did not receive a questionnaire please call (313)769-9912. Thank You!

*Paul D. Lindseth
University of Michigan
101 North Main, Suite 150-900
Ann Arbor, MI 48104*

APPENDIX G

PHASE ONE REMINDER COVER LETTER

101 North Main
Suite 150-900
Ann Arbor, MI 48104

Dear Aviation Expert:

As one of only a few aviation experts, your input is critical to the success of a dissertation research study on U.S. baccalaureate aviation program quality. To ensure your valuable response will be part of this study, I am sending another copy of the cover letter and questionnaire.

A return of the completed questionnaire at your earliest convenience would be appreciated! If you've already returned the questionnaire--Thank You! Please call me at (313) 769-9912 if you have any questions.

Thank you for your time and contribution to improving the quality of our nation's four-year aviation programs!

Sincerely,

Paul D. Lindseth
Doctoral Student
The University of Michigan
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APPENDIX H

AVIATION PROGRAM ABBREVIATIONS

CMSU Central Missouri State University

ERAU-D	DWC	Daniel Webster College
ERAU-P	Embry-Riddle Aeronautical University .Daytona	
	Embry-Riddle Aeronautical University .Prescott	
MktoSU	FIT	Florida Institute of Technology
MTSU	Mankato State University	
	Middle Tennessee State University	
	OhSU	Ohio State University
	Parks University	Parks College/St. Louis
	SUI/C	Southern Illinois University at
	Carbondale	
	SJSU	San Jose State University
UthSU	UND	University of North Dakota
	Utah State University	
	WMU	Western Michigan University

Part VI

Supplementary Questions and Response Options

Institutions and departments have been encouraged to prepare additional questions for distribution with this survey to obtain information that is relevant to specific local needs and interests. If your instructions contain additional questions, please record your responses to them below. (Fill in the oval for one number on each line, corresponding to the number of your preferred response to that question.)

1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please return your completed questionnaire as directed in the accompanying instructions.

If you have any comments or suggestions about this questionnaire, please send them to: Program Self-Assessment Service, Educational Testing Service, Princeton, New Jersey 08541-0001.

THANK YOU.

APPENDIX I

AVIATION STUDENT QUESTIONNAIRE

*Questionnaire taken from the Program Self-Assessment Service
Reproduced by Permission of Educational Testing Service*

PROGRAM ASSESSMENT QUESTIONNAIRE

UNDERGRADUATE STUDENTS

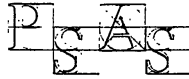
TO THE RESPONDENT:

The Program Self-Assessment Service (PSAS) was developed to assist undergraduate departments in evaluating their programs. This questionnaire is designed to be part of a comprehensive program review process involving faculty, students enrolled in the program, and alumni.

Although there are many reasons for conducting such reviews, the improvement of undergraduate programs clearly is a major potential benefit.

Your participation is very important, and you are encouraged to respond thoughtfully and candidly. The questionnaires are intended to be anonymous and confidential. Results will be summarized and reported only for groups; in no instances will responses of individuals be reported.

It should not take longer than 30 minutes to complete this questionnaire.



Institution _____

Department or Program _____



Higher
Education
Assessment

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Q1543

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DIRECTIONS

- Use only No. 2 pencil. Do NOT use ink, felt tip or ballpoint pen.
- Make heavy marks that completely fill the intended oval; do not use checks or X's.
- Erase completely any marks you wish to change.
- Make NO stray marks anywhere on this booklet.

Important: If you receive instructions asking you to indicate a subgroup, please fill in the appropriate oval at the right.	Subgroup 1 <input type="radio"/> Subgroup 2 <input type="radio"/> Subgroup 3 <input type="radio"/>
--	--

Part I

To what extent do you agree with the following statements about the program and/or department in which you are majoring? (Fill in only one response oval for each statement.)

- AS (4) = Agree Strongly.** You agree strongly with the statement as it applies to this department or program.
- A (3) = Agree.** You agree more than you disagree with the statement as it applies to this department or program.
- D (2) = Disagree.** You disagree more than you agree with the statement as it applies to this department or program.
- DS (1) = Disagree Strongly.** You disagree strongly with the statement as it applies to this department or program.

	AS	A	D	DS	
1. Most faculty members are genuinely interested in the welfare and professional development of departmental majors	○	○	○	○	9. The department actively helps graduates of this program find appropriate employment or pursue further study
2. Different scholarly points of view are encouraged by the faculty	○	○	○	○	10. Most faculty members prepare carefully for their courses
3. The program is academically demanding for most students	○	○	○	○	11. If I were starting over, I would major in this department again
4. This department has a humane environment characterized by mutual respect between undergraduate majors and professors	○	○	○	○	12. This program is providing me with very good preparation for my future professional work or advanced study
5. I have learned a great deal as a major in this department/program	○	○	○	○	13. Faculty members of this department work together to achieve program goals
6. I would advise a friend with similar interests to major in this department/program	○	○	○	○	14. This department is receptive to new ideas and ways of doing things
7. Students tend to support and help each other meet the academic demands of this program	○	○	○	○	15. There is good communication between faculty members and the department's undergraduates regarding student needs, concerns, and suggestions
8. The department is an academically stimulating place in which to study	○	○	○	○	16. There are many opportunities outside the classroom for interaction between majors and faculty

Part II

Please rate each of the following aspects of your department or program. If any item listed doesn't apply to your field, or if you feel you cannot respond, fill in the "0" oval. (Fill in only one response oval for each statement.)

E (4) = Excellent
 G (3) = Good
 F (2) = Fair
 P (1) = Poor

NA (0) = Not Applicable to my field

	E	G	F	P	NA		E	G	F	P	NA
1. Intellectual environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	16. Variety of advanced course and program offerings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Curricular and career advising	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	17. Depth in subject matter of advanced course and program offerings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Agreement between degree requirements and stated objectives of the program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	18. Flexibility of the program to meet the needs of individual undergraduate majors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Clarity of degree requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	19. Opportunities for departmental majors to pursue individual projects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Library holdings relevant to your field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	20. Opportunities for formal student evaluation of courses and instruction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Specialized facilities, such as laboratories or studios, and equipment needed for teaching and creative work in your field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	21. Institution's commitment to the program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Overall adequacy of space and other facilities for classes and administration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	22. Useful faculty criticism of your work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Scholarly and professional competency of the faculty in this program/department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	23. Faculty helpfulness in dealing with classwork	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Frequency with which courses required for the degree are offered	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	24. Faculty awareness of new developments in your field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Academic ability and preparation of students majoring in this program/department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	25. Interaction between this department or program and related disciplines or programs on the campus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Opportunities for student participation in departmental decisions affecting this program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	26. Overall adequacy of financial resources in support of this department or program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Relevance of the department's requirements for a degree to your anticipated work or to further study in the field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	27. Number of support and clerical staff in department/program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Appropriateness of procedures (grades, papers, exams) used to evaluate students in their courses in this department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	28. Quality of support and clerical staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Teaching methods used in departmental courses (e.g., lectures, seminars, audiovisual aids)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	29. Availability of student services (counseling, placement, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Accessibility of faculty members to undergraduate students majoring in this program/department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	30. Availability of financial assistance (grants, loans, etc.) for students in the department/program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
						31. Opportunities for intellectual and social interaction among the people in this department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Part III

1. Are you participating or have you participated in a clinical, field work, or internship experience as part of the work in your major? (Fill in only one response oval.)

- Yes, as a degree requirement
- Yes, not as a degree requirement
- No (Fill in "3" and go to Part IV)

If "yes," please evaluate the following aspects of your experience.

E (4) = Excellent
G (3) = Good
F (2) = Fair
P (1) = Poor

E (4) = Excellent
G (3) = Good
F (2) = Fair
P (1) = Poor

- | | E | G | F | P | | E | G | F | P |
|--|-----------------------|-----------------------|-----------------------|-----------------------|--|-----------------------|-----------------------|-----------------------|-----------------------|
| 2. Departmental training to prepare you for the experience | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | 5. Variety of assignments or activities | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 3. Contribution of the experience to your academic development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | 6. Supervision you received | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 4. Chance to develop professional skills | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | 7. Office space and equipment available for your use | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Part IV

Which of the following have you done within the last twelve months? (Fill in the oval for the appropriate response.)

1 = Yes
 2 = No

- | | Yes | No | | Yes | No |
|--|-----------------------|-----------------------|--|-----------------------|-----------------------|
| 1. Attended one or more meetings of a scholarly or professional society | <input type="radio"/> | <input type="radio"/> | 8. Talked with professionals in your field about further education or career plans | <input type="radio"/> | <input type="radio"/> |
| 2. Demonstrated artistic skills or products in a public performance or exhibit | <input type="radio"/> | <input type="radio"/> | 9. Pursued independent reading or practice in your field beyond that assigned in courses | <input type="radio"/> | <input type="radio"/> |
| 3. Prepared a detailed proposal or plan for a major research project or paper | <input type="radio"/> | <input type="radio"/> | 10. Operated an independent enterprise or business | <input type="radio"/> | <input type="radio"/> |
| 4. Carried out an independent research or creative project | <input type="radio"/> | <input type="radio"/> | 11. Won a prize or an award for a product or an activity related to your field | <input type="radio"/> | <input type="radio"/> |
| 5. Cooperated in a research or creative project(s) with another student or a faculty member | <input type="radio"/> | <input type="radio"/> | 12. Served on a departmentwide or institutionwide committee | <input type="radio"/> | <input type="radio"/> |
| 6. Held a fellowship, training grant, or scholarship | <input type="radio"/> | <input type="radio"/> | 13. Participated in department or program planning activities (e.g., review of the curriculum) | <input type="radio"/> | <input type="radio"/> |
| 7. Developed professional skills through participation in a clinical, field work, or internship experience | <input type="radio"/> | <input type="radio"/> | | | |

Part V

Some departments or programs give primary attention to the preparation of teachers; some emphasize the preparation of practicing professionals for applied and service positions (e.g., administrators, museum curators, clinicians, industrial chemists); some emphasize preparation for more advanced study; and others offer personal enrichment.

A. How much importance do you think your department/program now assigns each of these purposes or functions? (Fill in only one response for each.)

Degree of Importance
 5 = Extreme Importance
 4 = Considerable Importance
 3 = Some Importance
 2 = Little Importance
 1 = No Importance

5 4 3 2 1

- 1. Preparing undergraduates to become teachers
- 2. Preparing undergraduates for other jobs
- 3. Preparing students for more advanced study
- 4. Providing personal enrichment

B. Now, please answer the same question in terms of your personal goals. How much importance would you assign to each of these programs, purposes or functions? Fill in only one response for each.

Degree of Importance
 5 = Extreme Importance
 4 = Considerable Importance
 3 = Some Importance
 2 = Little Importance
 1 = No Importance

5 4 3 2 1

- 5. Preparing undergraduates to become teachers
- 6. Preparing undergraduates for other jobs
- 7. Preparing students for more advanced study
- 8. Providing personal enrichment

Go on to Part VI on next page

Part VI

1. Approximately what overall grade average do you have as an undergraduate (column A), and what grades have you received so far as a major in this department or program (column B)? (Important: If your college or university does not use letter grades [A, B, C, etc.] please fill in the oval for the letter grade that is the closest equivalent to your grade average.) Fill in only one response in each column.

A = Overall grade average as an undergraduate
B = Grades in this department

	A	B
C or lower (2.49 or below)	<input type="radio"/>	<input type="radio"/>
C+ (2.50 - 2.74)	<input type="radio"/>	<input type="radio"/>
B- (2.75 - 2.99)	<input type="radio"/>	<input type="radio"/>
B (3.00 - 3.24)	<input type="radio"/>	<input type="radio"/>
B+ (3.25 - 3.49)	<input type="radio"/>	<input type="radio"/>
A- (3.50 - 3.74)	<input type="radio"/>	<input type="radio"/>
A (3.75 - 3.99)	<input type="radio"/>	<input type="radio"/>
All A's (4.00)	<input type="radio"/>	<input type="radio"/>

2. For most of your study in this department, have you attended:

Full time
 Part time

3. What do you hope to do after you complete this program and receive your degree? (If you are considering more than one, fill in only the oval for your first preference.)

- Work in a four-year college or university
- Work in a community college
- Work in an elementary, intermediate, or secondary school
- Work for a nonprofit agency or institution
- Work in business or industry
- Work for the government
- Enter one of the armed services
- Self-employment or private practice
- Other type of employment setting
- Continue my formal education (e.g., four-year college, graduate, or professional school)
- Not be employed

4. What do you hope will be the primary activity in your job following completion of your undergraduate degree? (Fill in only the oval for your first preference.)

- Further formal education or training
- Management or administration
- Teaching
- Professional service
- Scientific or technical service
- Other

5. Indicate the highest degree objective you are now considering.

- Nondegree study
- Certificate (teaching, etc.)
- Associate's degree (A.A., A.S., etc.)
- Bachelor's degree (B.A., B.S., etc.)
- Master's degree (M.A., M.S., M.Ed., M.B.A., etc.)
- First professional (M.D., LL.S., etc.)
- Doctorate (Ph.D., Ed.D., D.B.A., etc.)

6. What is your sex?

- Male
- Female

7. What is your age?

- Under 20
- 20 - 30
- 31 - 40
- 41 - 50
- Over 50

If you have been given additional locally written questions, please respond on the following page.

Student Supplemental Questions

Please respond to the following questions to complete the survey. Thank you for your time. It is greatly appreciated!

To what extent do you agree with the following statements? Please circle your response.

1. The number of aircraft available for student training is adequate.

Agree strongly Agree Disagree Disagree Strongly

2. The maintenance performed on the aircraft that are used for student training is adequate.

Agree strongly Agree Disagree Disagree Strongly

3. The safety procedures in the aviation program's flight area are adequate.

Agree strongly Agree Disagree Disagree Strongly

4. What is your hometown (include state) and country (if outside United States)?

city state country

5. What job would you like upon graduation?

THANK YOU!!

Part VII

Supplementary Questions and Response Options

Institutions and departments have been encouraged to prepare additional questions for distribution with this survey to obtain information that is relevant to specific local needs and interests. If your instructions contain additional questions, please record your responses to them below. (Fill in the oval for one number on each line, corresponding to the number of your preferred response to that question.)

1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please return your completed questionnaire as directed in the accompanying instructions.
If you have any comments or suggestions about this questionnaire, please send them to: Program Self-Assessment Service, ETS Higher Education Assessment, Princeton, New Jersey 08541-0001.

THANK YOU.

APPENDIX J

AVIATION FACULTY QUESTIONNAIRE

Questionnaire taken from the Program Self-Assessment Service
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PROGRAM ASSESSMENT QUESTIONNAIRE

FACULTY MEMBERS

TO THE RESPONDENT:

The Program Self-Assessment Service (PSAS) was developed to assist undergraduate departments in evaluating their programs. This questionnaire is designed to be part of a comprehensive program review process involving faculty, students enrolled in the program, and alumni.

Although there are many reasons for conducting such reviews, the improvement of undergraduate programs clearly is a major potential benefit.

Your participation is very important, and you are encouraged to respond thoughtfully and candidly. The questionnaires are intended to be anonymous and confidential. Results will be summarized and reported only for groups; in no instance will responses of individuals be reported.

It should not take longer than 30 minutes to complete this questionnaire.



Institution _____
Department or Program _____



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Q 1542

DIRECTIONS

- Use only No. 2 lead pencil. Do NOT use ink, felt tip or ballpoint pen.
- Make heavy marks that completely fill the intended oval, do not use checks or X's.
- Erase completely any marks you wish to change.
- Make NO stray marks anywhere on this booklet.

Important: If you receive instructions asking you to indicate a subgroup, please fill in the appropriate oval at the right.

Subgroup 1

Subgroup 2

Subgroup 3

Part I

To what extent do you agree with the following statements about the program and/or department that is being reviewed? (Fill in only one response oval for each statement.) When answering questions about students, think of the students you have known in your classes or area of specialization.

- AS (4) = Agree Strongly.** You agree strongly with the statement as it applies to this department or program.
A (3) = Agree. You agree more than you disagree with the statement as it applies to this department or program.
D (2) = Disagree. You disagree more than you agree with the statement as it applies to this department or program.
DS (1) = Disagree Strongly. You disagree strongly with the statement as it applies to this department or program.

	AS	A	D	DS		AS	A	D	DS
1. Most faculty members are genuinely interested in the welfare and professional development of departmental majors . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	10. Most faculty members prepare carefully for their courses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Different scholarly points of view are encouraged.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	11. This is a good department in which to work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. The program is academically demanding for most students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	12. I am satisfied with the academic freedom in the department relative to my teaching and research	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. This department has a humane environment characterized by mutual respect between undergraduate majors and faculty members	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	13. Members of this department work together to achieve program goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. My responsibilities create conflicting demands that are a source of personal strain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	14. This department is receptive to new ideas and ways of doing things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. My personal views about undergraduate education are compatible with the objectives and procedures of the department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	15. There is good communication between faculty members and the department's undergraduates regarding student needs, concerns, and suggestions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Students tend to support and help each other meet the academic demands of this program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	16. There are many opportunities outside the classroom for interaction between majors and faculty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. The department is an academically stimulating place for undergraduate students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	17. In general, I am satisfied with my opportunities to influence departmental policies and decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. The department actively helps graduates of its program find appropriate employment or pursue further study	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>					

Part II

How would you rate each of the following aspects of the program or department being reviewed? If any item listed doesn't apply to your field, or if you feel you cannot respond, fill in the "0" oval. (Fill in only one response oval for each statement.)

E (4) = Excellent
 G (3) = Good
 F (2) = Fair
 P (1) = Poor
 NA (0) = Not Applicable to my field

	E	G	F	P	NA		E	G	F	P	NA
1. Intellectual environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	16. Variety of advanced course and program offerings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Curricular and career advising	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	17. Depth in subject matter of advanced course and program offerings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Agreement between degree requirements and stated objectives of the program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	18. Flexibility of the program to meet the needs of individual undergraduate majors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Clarity of degree requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	19. Opportunities for majors to pursue individual projects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Library holdings relevant to the field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	20. Opportunities for formal student evaluation of courses and instruction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Specialized facilities, such as laboratories or studios, and equipment needed for teaching and creative work in your field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	21. Institution's commitment to the program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Overall adequacy of space and other facilities for classes and administration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	22. Clarity of the department's objectives and plans for the next few years	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Scholarly and professional competency of the undergraduate faculty in the program/department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	23. Administrative management of the department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Frequency with which courses required for the degree are offered	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	24. Faculty awareness of new developments in the field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Academic ability and preparation of students majoring in this program/department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	25. Interaction between the department/program and related disciplines or programs on the campus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Opportunities for student participation in departmental decisions affecting the program(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	26. Overall adequacy of financial resources in support of this program/department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Relevance of the department's requirements for a degree to students' anticipated work or further study in the field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	27. Number of support and clerical staff (including student assistants) in the department/program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Appropriateness of procedures (grades, papers, exams) used to evaluate students in their courses in the department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	28. Quality of support and clerical staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Teaching methods used in departmental courses (e.g., lectures, seminars, audiovisual aids)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	29. Mutual professional respect among the faculty in this department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Accessibility of faculty members to undergraduate students majoring in the department or program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	30. Departmental efforts in support of the career development of faculty members	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Part III

Please fill in the appropriate response oval to indicate your experience in each of the following areas.

		Yes	No			Yes	No
1.	Have you served on a professional, government, or foundation review committee, site visit team, or national/state/regional advisory council in the last three years?	<input type="radio"/>	<input type="radio"/>	6.	Have you held office or served on any committees of regional or state professional organizations?	<input type="radio"/>	<input type="radio"/>
2.	Have you received an award or otherwise been recognized for outstanding teaching?	<input type="radio"/>	<input type="radio"/>	7.	Have you been the editor or served on the editorial board of a journal in your field?	<input type="radio"/>	<input type="radio"/>
3.	Have you received an award or otherwise been recognized for outstanding research or other scholarly or creative work?	<input type="radio"/>	<input type="radio"/>	8.	Have you refereed or served as a reviewer of one or more articles submitted to a professional journal in your field in the last two years?	<input type="radio"/>	<input type="radio"/>
4.	Have you received an award or otherwise been recognized for outstanding professional practice?	<input type="radio"/>	<input type="radio"/>	9.	Have you had an institutional or departmental grant to support your research or other scholarly or creative work in the past three years?	<input type="radio"/>	<input type="radio"/>
5.	Have you held office or served on the board of a national professional association or organization?	<input type="radio"/>	<input type="radio"/>	10.	Have you had a grant or contract with an agency outside this institution to support your research or other scholarly or creative work within the last three years?	<input type="radio"/>	<input type="radio"/>

Part IV

Some programs give primary attention to the preparation of teachers; some emphasize the preparation of practicing professionals for applied and service positions (e.g., administrators, museum curators, clinicians, industrial chemists); some emphasize preparation for more advanced study; and others offer personal enrichment.

A. How much importance do you think your department/program now assigns each of these purposes or functions? (Fill in only one response oval on each line.)

B. How much importance do you think the department should assign to each of these purposes? (Fill in only one response oval on each line.)

Degree of Importance
 5 = Extreme Importance
 4 = Considerable Importance
 3 = Some Importance
 2 = Little Importance
 1 = No Importance

Degree of Importance
 5 = Extreme Importance
 4 = Considerable Importance
 3 = Some Importance
 2 = Little Importance
 1 = No Importance

		5	4	3	2	1			5	4	3	2	1
1.	Preparing undergraduates to be teachers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5.	Preparing undergraduates to be teachers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.	Preparing undergraduates for other jobs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	6.	Preparing undergraduates for other jobs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3.	Preparing students for more advanced study	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	7.	Preparing students for more advanced study	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.	Providing personal enrichment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	8.	Providing personal enrichment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Part V

Please answer the following questions about your activities and background by filling in the appropriate response oval.

1. List the number of your professional publications or other products in each of the following areas in the last five years. Include work produced alone and in collaboration with others.

- 1 = None
- 2 = 1 or 2
- 3 = 3 or 4
- 4 = 5 or 6
- 5 = More than six

	1	2	3	4	5
a. Professional articles, chapters in books	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Authored or edited books	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Monographs, manuals, published reviews	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Sponsored exhibitions or public performance of artistic or other creative work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Conference or workshop presentations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. How many times in the past two years have you given a prepared speech or made a formal presentation based on your research or other work?

a. At a state, regional, or national professional meeting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. At another college, or at a business or industrial organization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. To what extent are you involved with the program being reviewed? (Fill in "0" if not applicable to this program.)

- 3 = Frequently
- 2 = Occasionally
- 1 = Never
- 0 = Not Applicable to this program

	3	2	1	0
a. Teach courses required by the program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Participate in policy and curriculum decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Direct independent studies or theses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Supervise field work or internships	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Serve as a faculty adviser	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Arrange student contacts with non-academic professionals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. What is your present academic rank?

Do not hold academic rank	<input type="radio"/>
Adjunct faculty member	<input type="radio"/>
Lecturer or instructor	<input type="radio"/>
Assistant professor	<input type="radio"/>
Associate professor	<input type="radio"/>
Professor	<input type="radio"/>

5. What is your present academic appointment?

Full time	<input type="radio"/>
Part time	<input type="radio"/>

Part V continues on page 6.

Part V (Continued)

6. Do you have tenure at this college or university?
 Yes
 No

7. What is your highest earned degree?
 Doctorate (Ph.D., Ed.D., D.B.A., etc.)
 First professional (M.D., LL.B., etc.)
 Master's degree (M.A., M.S., M.Ed., M.B.A., etc.)
 Bachelor's degree (B.A., B.S., etc.)
 Other, or no degree

Use the following scale for questions 8-10.

- 1 = Less than one full year
- 2 = 1 or 2 years
- 3 = 3 to 6 years
- 4 = 7 to 12 years
- 5 = 13 to 20 years
- 6 = More than 20 years

8. How many years has it been since you received your highest earned degree?

9. How many years of applied professional experience have you had?

10. How many years of college or university teaching experience have you had?
 a. In this department
 b. Total

11. Approximately what percentage of your total professional time is spent in each of the following activities?
 1 = None
 2 = 1% - 10%
 3 = 11% - 25%
 4 = 26% - 50%
 5 = 51% - 75%
 6 = 76% - 100%

	1	2	3	4	5	6
a. Teaching, advising students, and related activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Research or scholarly work, such as composing or writing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Departmental or institutional administration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Consulting or community service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Private practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Other employment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Other _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. What is your sex?
 Male
 Female

13. What is your age?
 30 or under
 31 - 40 years
 41 - 50 years
 51 - 60 years
 61 - 70 years
 over 70

If you have been given additional, locally written questions, please respond on the following page.

Supplemental Faculty Questions - Page 1

Please respond to the following questions to complete the survey. Thank you for your time. It is greatly appreciated!

1. Please list the FAA certificates you possess.

2. How many semester or quarter credit hours are you teaching?

____ semester hours OR ____ quarter hours

To what extent do you agree with the following statements? Please circle your response.

3. The safety procedures in the aviation program's flight area are adequate.

Agree strongly Agree Disagree Disagree Strongly

4. The aircraft maintenance for student training is adequate.

Agree strongly Agree Disagree Disagree Strongly

5. The mathematics standards are adequate for the aviation program's majors.

Agree strongly Agree Disagree Disagree Strongly

THANK YOU!!

Part VI

Supplementary Questions and Response Options

Institutions and departments have been encouraged to prepare additional questions for distribution with this survey to obtain information that is relevant to specific local needs and interests. If your instructions contain additional questions, please record your responses to them below. (Fill in only one response oval for each question.)

1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please return your completed questionnaire as directed in the accompanying instructions.

If you have any comments or suggestions about this questionnaire, please send them to: Program Self-Assessment Service, Educational Testing Service, Princeton, New Jersey 08541-0001.

THANK YOU.

APPENDIX K

AVIATION ALUMNI QUESTIONNAIRE

*Questionnaire taken from the Program Self-Assessment Service
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PROGRAM ASSESSMENT QUESTIONNAIRE

Alumni

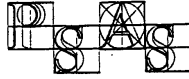
TO THE RESPONDENT:

The Program Self-Assessment Service (PSAS) was developed to assist undergraduate departments in evaluating their programs. This questionnaire is designed to be part of a comprehensive program review process involving faculty, students enrolled in the program, and alumni.

Although there are many reasons for conducting such reviews, the improvement of undergraduate programs clearly is a major potential benefit.

Your participation is very important, and you are encouraged to respond thoughtfully and candidly. The questionnaires are intended to be anonymous and confidential. Results will be summarized and reported only for groups; in no instance will responses of individuals be reported.

It should not take longer than 30 minutes to complete this questionnaire.



Institution _____

Department or Program _____

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Q 1541

DIRECTIONS

- Use only No. 2 lead pencil: Do NOT use ink, felt tip or ballpoint pen.
- Make heavy black marks that completely fill the intended oval; do not use checks or X's.
- Erase completely any marks you wish to change.
- Make NO stray marks anywhere on this booklet.

Important: If you receive instructions asking you to indicate a subgroup, please fill in the appropriate oval at the right.	Subgroup 1 <input type="radio"/> Subgroup 2 <input type="radio"/> Subgroup 3 <input type="radio"/>
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Part I

To what extent do you agree with the following statements about the department/program from which you received your undergraduate degree? Please give your opinion based on your best recollection of your experiences as an undergraduate major. (Fill in only one response oval for each statement.)

- AS (4) = Agree Strongly.** You agree strongly with the statement as it applies to this department or program.
A (3) = Agree. You agree more than you disagree with the statement as it applies to this department or program.
D (2) = Disagree. You disagree more than you agree with the statement as it applies to this department or program.
DS (1) = Disagree Strongly. You disagree strongly with the statement as it applies to this department or program.

	AS	A	D	DS		AS	A	D	DS
1. Most faculty members were genuinely interested in the welfare and professional development of the undergraduate majors.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Different scholarly points of view were encouraged by the faculty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. The program was academically demanding for most students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. The department had a humane environment characterized by mutual respect between undergraduate majors and professors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I learned a great deal as an undergraduate major in the department/program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I would advise a friend with similar interests to major in the department/program.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Students tended to support and help each other meet the academic demands of the program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. The department was an academically stimulating place in which to study	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. The department actively helped graduates of the program find appropriate employment or pursue further study	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Most faculty members prepared carefully for their courses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. If I were starting over, I would major in the same department/program again	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. The program provided me with very good preparation for my later professional work/advanced study	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Members of the department worked together to achieve program goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. The department was receptive to new ideas and ways of doing things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. There was good communication between faculty members and undergraduate majors regarding student needs, concerns, and suggestions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. There were many opportunities outside the classroom for interaction between departmental majors and faculty members	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Part II

How would you rate your department's faculty and your program? If an item listed below doesn't apply to your field, or if you feel you cannot respond, fill in the "0" oval. (Fill in only one response oval for each statement.)

E (4) = Excellent
 G (3) = Good
 F (2) = Fair
 P (1) = Poor
 NA (0) = Not Applicable to my field

	E	G	F	P	NA		E	G	F	P	NA
1. Intellectual environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	15. Accessibility of faculty members to undergraduate students majoring in the department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Curricular and career advising	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	16. Variety of advanced course and program offerings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Agreement between degree requirements and stated objectives of the program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	17. Depth in subject matter of advanced course and program offerings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Clarity of degree requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	18. Flexibility of the program to meet the needs of individual students majoring in the department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Library holdings relevant to your field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	19. Opportunities for majors to pursue individual projects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Specialized facilities, such as laboratories or studios, and equipment needed for teaching and creative work in your field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	20. Opportunities for formal student evaluation of courses and instruction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Overall adequacy of space and other facilities for classes and administration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	21. Institution's commitment to the program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Scholarly and professional competency of the undergraduate faculty in the department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	22. Useful faculty criticism of your work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Frequency with which courses required for the degree were offered	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	23. Faculty helpfulness in dealing with classwork	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Academic ability and preparation of students who were majoring in the program/department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	24. Faculty awareness of new developments in your field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Opportunities for student participation in departmental decisions that affected your program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	25. Interaction between the department/program and related disciplines or programs on the campus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. How relevant were the degree requirements for further study or for work in your field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	26. Overall adequacy of financial resources in support of program/department when you were enrolled	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Appropriateness of procedures (grades, papers, exams) used to evaluate students in their courses in the department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	27. Number of support and clerical staff (including student assistants) in the program/department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Teaching methods used in departmental courses (e.g., lectures, seminars, audiovisual aids)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	28. Quality of support and clerical staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

1. Did you participate in a clinical, field work, or internship experience as part of your undergraduate major? (Fill in only one response oval.)
- Yes, as a degree requirement
- Yes, not as a degree requirement
- No (Fill in the "3" oval and go to Part IV)
- If "yes," please evaluate the following components of your experience.
- E (4) = Excellent
G (3) = Good
F (2) = Fair
P (1) = Poor
- E G F P
2. Departmental training to prepare you for the experience
3. Contribution of the experience to your academic development
4. Chance to develop your professional skills
5. Variety of assignments or activities
6. Supervision you received
7. Office space and equipment available for your use

Part IV

Thinking back to the time when you were an undergraduate major in this department . . .

- A. What was your primary purpose in pursuing an undergraduate degree? (Fill in the oval for the one most important purpose.)
- Preparation for a specific job or career
- Preparation for further study
- Updating and improvement of academic or technical skills
- Qualifying for higher pay or job advancement
- Personal enrichment
- Other
- B. Overall, how well do you think your department or program satisfied your primary purpose for enrollment, as indicated in the previous question?
- Not very well
- Fairly well
- Extremely well

Part V

Please answer the following questions about your activities and background.

1. What degree did you receive on completion of your major in this department or program (column A), and what is the highest degree you have received or hope to attain (column B)? (Fill in the oval for only one number in each column.)
- A = Degree received on completing your major in this department
B = Highest degree received, or degree goal
- | | A | B |
|--|-----------------------|-----------------------|
| Nondegree study | <input type="radio"/> | <input type="radio"/> |
| Certificate (teaching, etc.) | <input type="radio"/> | <input type="radio"/> |
| Associate's degree (A.A., A.S., etc.) | <input type="radio"/> | <input type="radio"/> |
| Bachelor's degree (B.A., B.S., etc.) | <input type="radio"/> | <input type="radio"/> |
| Master's degree (M.A., M.S., M.B.A., etc.) | <input type="radio"/> | <input type="radio"/> |
| First professional (M.D., LL.B., etc.) | <input type="radio"/> | <input type="radio"/> |
| Doctorate (Ph.D., Ed.D., D.B.A., etc.) | <input type="radio"/> | <input type="radio"/> |
| Postdoctoral study | <input type="radio"/> | <input type="radio"/> |
2. For most of your study in this program, did you attend:
- Full time
- Part time
3. Have you received any additional degrees since completing this program?
- Yes
- No
- Currently enrolled in degree-granting program

Part V (continued)

4. Approximately what overall grade average did you receive as an undergraduate (column A), and what grades did you receive in your major (column B)? (Important: If your college or university did not use letter grades (A, B, C, etc.), please fill in the oval for the letter grade that is the closest equivalent to your grade average.) Fill in only one response oval in each column.

A = Overall undergraduate grade average
B = Grade average in your major

	A	B
C or lower (2.49 or below)	<input type="radio"/>	<input type="radio"/>
C+ (2.50–2.74)	<input type="radio"/>	<input type="radio"/>
B– (2.75–2.99)	<input type="radio"/>	<input type="radio"/>
B (3.00–3.24)	<input type="radio"/>	<input type="radio"/>
B+ (3.25–3.49)	<input type="radio"/>	<input type="radio"/>
A– (3.50–3.74)	<input type="radio"/>	<input type="radio"/>
A (3.75–3.99)	<input type="radio"/>	<input type="radio"/>
All A's (4.00)	<input type="radio"/>	<input type="radio"/>

5. Indicate your first job (including formal education) after completing your major in this department or program by filling in one oval in the first column (A). Indicate your current job by filling in one oval in the second column (B). If you had or have more than one job, or attended school while working, indicate the one position in each period that you consider the most important.

A = First position
B = Current position

	A	B
Continued formal education (four-year college, graduate or professional school)	<input type="radio"/>	<input type="radio"/>
Work in a four-year college or university	<input type="radio"/>	<input type="radio"/>
Work in a community college	<input type="radio"/>	<input type="radio"/>
Work in an elementary, intermediate, or secondary school	<input type="radio"/>	<input type="radio"/>
Work in a nonprofit agency or institution	<input type="radio"/>	<input type="radio"/>
Work in business or industry	<input type="radio"/>	<input type="radio"/>
Work for the government	<input type="radio"/>	<input type="radio"/>
Enter one of the armed services	<input type="radio"/>	<input type="radio"/>
Self-employment or private practice	<input type="radio"/>	<input type="radio"/>
Other type of employment setting	<input type="radio"/>	<input type="radio"/>
Not employed or engaged in formal education	<input type="radio"/>	<input type="radio"/>

6. What was your primary activity in your first position after completing your major in this program (column A), and what is your primary activity in your present job (column B)? (Fill in the oval for one number in each column.)

A = Activity in first position
B = Activity in present job

	A	B
Further study or training	<input type="radio"/>	<input type="radio"/>
Administration or management	<input type="radio"/>	<input type="radio"/>
Teaching	<input type="radio"/>	<input type="radio"/>
Professional service	<input type="radio"/>	<input type="radio"/>
Scientific or technical service	<input type="radio"/>	<input type="radio"/>
Other _____	<input type="radio"/>	<input type="radio"/>
Not employed or engaged in formal education	<input type="radio"/>	<input type="radio"/>

7. Were these positions:

Full time	<input type="radio"/>
Part time	<input type="radio"/>
Not employed	<input type="radio"/>

8. What is your approximate annual income from employment and related professional activities (e.g., honoraria, royalties)? Include salary before deductions but without fringe benefits paid by the employer.

Less than \$10,000	<input type="radio"/>
\$10,000–\$14,999	<input type="radio"/>
\$15,000–\$19,999	<input type="radio"/>
\$20,000–\$24,999	<input type="radio"/>
\$25,000–\$29,999	<input type="radio"/>
\$30,000–\$34,999	<input type="radio"/>
\$35,000–\$39,999	<input type="radio"/>
\$40,000–\$49,999	<input type="radio"/>
\$50,000 or above	<input type="radio"/>
Not employed	<input type="radio"/>

Part V continues on page 6.

Part V (continued)

9. To what extent did your education in this program or department prepare you for further formal education?

- Not at all
- Some, but not much
- Quite a bit
- A great deal
- Not applicable

10. If employed, to what extent does your present position make use of the education and training you received in this program or department?

- Not at all
- Some, but not much
- Quite a bit
- A great deal
- Not employed

11. Based on your training and/or experience, how would you describe your present employment?

- An appropriate level for me at this time
- A somewhat lower level than appropriate
- A much lower level than appropriate
- Not presently employed

12. How helpful was each of the following in finding a job or continuing your education when you completed study in this program? (Fill in the oval for one number on each line.)

- 4 = Extremely helpful
- 3 = Very helpful
- 2 = Of some help
- 1 = Not at all helpful
- 0 = Did not use

4 3 2 1 0

- a. The department's formal or informal effort
- b. Assistance of individual professors
- c. The placement office
- d. Openings listed with professional associations
- e. Letters you sent directly to employers without knowing whether they had openings

13. Please fill in the oval for the number of your publications or other products in each of the following areas in the last five years. Include works produced alone and in collaboration with others.

- 1 = None
- 2 = 1 or 2
- 3 = 3 or 4
- 4 = 5 or 6
- 5 = More than six

1 2 3 4 5

- a. Professional articles, chapters in books
- b. Authored or edited books
- c. Monographs, manuals, professional reviews
- d. Sponsored exhibition(s) or public performance(s) of artistic or other creative work
- e. Conference or workshop presentation(s)

14. How many times in the past two years have you given a prepared speech or made a formal presentation based on your research or other work you have done?

- a. At a state, regional, or national professional meeting
- b. At another college or at a business or industrial organization

15. What is your sex?

- Male
- Female

16. What is your age?

- Under 20
- 20-30
- 31-40
- 41-50
- 51-60
- Over 60

If you have been given additional locally written questions, please respond on the following page.

Alumni Supplemental Questions

Please respond to the following questions to complete the survey. Thank you for your time. It is greatly appreciated!

1. In what year did you graduate from the aviation program? _____
2. What would have made your education obtained through this aviation program more valuable?

3. What is your present job title or job description?

THANK YOU!!



Part VI

Supplementary Questions and Response Options

Institutions and departments have been encouraged to prepare additional questions for distribution with this survey to obtain information that is relevant to specific local needs and interests. If your instructions contain additional questions, please record your responses to them below. (Fill in the oval for one number on each line, corresponding to the number of your preferred response to that question.)

1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please return your completed questionnaire as directed in the accompanying instructions.

If you have any comments or suggestions about this questionnaire, please send them to: Program Self-Assessment Service, Educational Testing Service, Princeton, New Jersey 08541-0001.

THANK YOU.

APPENDIX L**PHASE TWO EXPERT PANEL LETTER**

July 30, 1994

Dear Council on Aviation Accreditation Member,

As one of only five randomly selected Council on Aviation Accreditation members I would appreciate your help as an aviation expert for my dissertation research at the University of Michigan. Participation should take approximately 30 minutes to critique three questionnaires.

Enclosed please find the three questionnaires that will be used to measure U.S. baccalaureate aviation program quality for the dissertation study. Your review of the instruments to determine the validity of the instruments for measuring quality in our nation's four-year aviation programs would be invaluable. The tools are Educational Testing Service instruments developed for evaluating general undergraduate academic programs. There are separate questionnaires for students, faculty, and alumni to determine overall program effectiveness.

I have enclosed an abstract of the dissertation proposal to give you an overview of my study. Also enclosed is a list outlining the 16 different areas the instruments measure with a brief explanation of each area. Your comments as to whether these instruments measure the outlined 16 areas as they pertain to our four-year aviation programs is appreciated. Although the questionnaires may appear to be too long, they will be condensed when formatted for printing.

If you have any questions regarding the study, please call me at 313-769-9912. Your willingness to provide this valuable information is appreciated. Thank you _____ for your important contributions to Aviation Education!

Sincerely,

Paul D. Lindseth
Doctoral Student, University of Michigan
101 North Main: Suite 150-900
Ann Arbor, MI 48104

APPENDIX M

PHASE TWO INTRODUCTORY LETTER

101 North Main
Suite 150-900
Ann Arbor, MI 48104

Dear Aviation Program Administrator

Approximately three months ago I sent out the initial survey for a study being conducted at the University of Michigan for my dissertation research. In this study I asked aviation industry and aviation education experts to participate in a quality

criteria survey of the 70 baccalaureate aviation programs in this country. The results of the survey are being analyzed in order to identify the indicators of quality in ranked U.S. baccalaureate aviation programs.

) I am now completing phase two of the study involving a random sample of the 70 aviation programs and would like permission to survey students, faculty, and alumni from your program to learn more about indicators of quality in U.S. baccalaureate aviation programs. Information obtained from the survey will only be reported as grouped data and will remain strictly confidential.

I will be calling you in the next few days to answer any questions you may have and to receive permission to survey your faculty, senior-level students, and a random selection of 50 alumni.

For your information and in appreciation of your cooperation, I will send you a summary of the results when the study is complete. If you have any immediate questions, you can contact me at 701-777-2917.

Thank you for your cooperation!

Sincerely,

Paul D. Lindseth
Doctoral Student
University of Michigan

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APPENDIX N

PHASE TWO STUDENT COVER LETTER

118 North Main--900
Ann Arbor, MI 48104
January 15, 1995

Dear Senior-level Aviation Student:

For the past twenty years I have been a member of the professional aviation community. For the past three years I have been pursuing a Ph.D. from the University of Michigan. My dissertation research for the Ph.D. degree addresses the quality of the leading four-year aviation education programs.

The overall aim of the study is to promote higher academic program quality in U.S. baccalaureate aviation programs and possibly other professional undergraduate programs as well. The results of this study will allow aviation education administrators to evaluate their own programs for necessary alterations. The results also should benefit aviation program accreditors in evaluating present accreditation standards and aid potential students in making decisions concerning enrollment based on specific qualities of these schools. Since you are one of only a select number of participants, your personal cooperation is most important to the success of this study.

Please answer the enclosed questionnaire as it applies to your aviation program/department and seal it in the envelope when completed. All replies to the questionnaire will be kept confidential and no respondent will be identified in the study or elsewhere by name or position. Participation in this study is voluntary; and individual questions may be skipped. The identification number on the questionnaire is solely for any follow-up correspondence. Questionnaires will be destroyed upon completion of the study. By completing the enclosed questionnaire, you are consenting to participate in this study and allowing the information you provide to be reported as grouped data.

Thank you very much for your time and cooperation!

Sincerely,

Paul D. Lindseth
Doctoral Student
University of Michigan

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APPENDIX 0

PHASE TWO FACULTY COVER LETTER

118 North Main-900
Ann Arbor, MI 48104
January 15, 1995

Dear Aviation Faculty Member:

For the past twenty years I have been a member of the professional aviation community. For the past three years I have been pursuing a Ph.D. from the University of Michigan. My dissertation research for the Ph.D. degree addresses the quality of the leading four-year aviation education programs.

The overall aim of the study is to promote higher academic program quality in U.S. baccalaureate aviation programs and possibly other professional undergraduate programs as well. The results of this study will allow aviation education administrators to evaluate their own programs for necessary alterations. The results also should benefit aviation program accreditors in evaluating present accreditation standards and aid potential students in making decisions concerning enrollment based on specific qualities of these schools. Since you are one of only a select number of participants, your personal cooperation is most important to the success of this study.

Please answer the enclosed questionnaire as it applies to your aviation program/department and seal it in the envelope when completed. All replies to the questionnaire will be kept confidential and no respondent will be identified in the study or elsewhere by name or position. Participation in this study is voluntary; and individual questions may be skipped. The identification number on the questionnaire is solely for any follow-up correspondence. Questionnaires will be destroyed upon completion of the study. By completing the enclosed questionnaire, you are consenting to participate in this study and allowing the information you provide to be reported as grouped data.

Thank you very much for your time and cooperation!

Sincerely,

Paul D. Lindseth
Doctoral Student
University of Michigan

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APPENDIX P

PHASE TWO ALUMNI COVER LETTER

118 South Main-900
Ann Arbor, MI 48104
January 22, 1995

Dear Aviation Alumni:

For the past twenty years I have been a member of the professional aviation community; and during the past three years I have been pursuing a Ph.D. at the University of Michigan. My dissertation research for the Ph.D. degree addresses the quality of the leading four-year aviation education programs. The overall aim of the study is to promote higher academic program quality in U.S. baccalaureate aviation programs. The results of this study will allow aviation education administrators to evaluate their own programs for necessary alterations. The results also should benefit aviation program accreditors in evaluating present accreditation standards and aid potential students in making decisions concerning enrollment based on specific qualities of these schools. Since you are one of only a select number of participants, your personal cooperation is most important to the success of this study.

As you think back to your aviation education at _____ please answer the enclosed questionnaire. All replies to the questionnaire will be kept confidential and no respondent will be identified in the study or elsewhere by name or position. Participation is voluntary; and individual questions may be skipped. The number on the questionnaire is solely for any follow-up correspondence. Questionnaires will be destroyed upon completion of the study. By completing the questionnaire and returning it to me in the enclosed self-addressed stamped envelope, you are consenting to participate in this study and allowing the information you provide to be reported as grouped data.

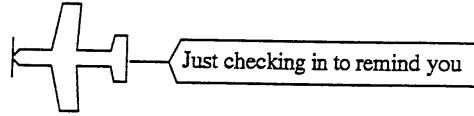
If you have any questions please do not hesitate to call me at 701-772-9257(collect) or FAX 701-772-6742. I would greatly appreciate receiving your completed questionnaire by February 15, 1995. Thank you so much for your time and cooperation in promoting educational quality in our nation's four-year aviation programs!

Sincerely,

Paul D. Lindseth
Doctoral Student
University of Michigan

APPENDIX Q

PHASE TWO ALUMNI FOLLOW-UP POST CARD



*Don't be left out --we want to hear about your aviation education!
Your comments are valuable! Please return the completed questionnaire
at your earliest convenience. In the event you did not receive a
questionnaire on the quality of your aviation education, please call
1-800-634-7215 (pin # 9257). Thank You!*

*Paul D. Lindseth
University of Michigan
118 South Main--900
Ann Arbor, MI 48104*

APPENDIX R

PHASE TWO ALUMNI FOLLOW-UP LETTER

_____ **1995**

118 South Main .900
Ann Arbor, MI 48104

Dear Aviation Program Alumni:

During the past few weeks an assessment questionnaire was mailed to you so you could evaluate your collegiate aviation program experiences. If you have already returned your questionnaire, thank you for your valuable responses! If you have not completed the questionnaire, your input is needed to successfully complete this dissertation study on baccalaureate aviation program quality.

Should your questionnaire be misplaced, or if you did not receive a questionnaire, please call me to receive another. A temporary toll-free telephone number (1-800-634-72 15) has been set up to request a replacement questionnaire and to answer any questions you may have. After dialing the 1-800 number, please respond with the PIN # 9257 when prompted by the telephone service.

Thank you so much for your time and cooperation in this study of aviation program quality. It is greatly appreciated!

Sincerely,

Paul D. Lindseth
Doctoral Student
University of Michigan
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APPENDIX S

PHASE TWO AVIATION PROGRAM ADMINISTRATOR QUESTIONNAIRE

Please respond to the following questions about your aviation program and return with the completed faculty and student questionnaires. Thank you for your cooperation!

1. Present number of aviation majors ___
2. Typical class size for a) Flight-related courses ___
 b) Nonflight-related courses ___
3. Does the aviation program provide its own flight training? _____
4. If #3 is yes, how many aircraft are utilized for student training? ___
5. How many aircraft are owned by the aviation program? ___
6. How many aircraft are leased by the aviation program? ___
7. Number of full-time aviation faculty members? ___ Number of part-time aviation faculty members? ___
8. Do you have any aviation program entrance requirements? ___ If yes, please list:
9. Do you have any graduation requirements above the college or university minimum? If yes, please list:
10. What percent of funding comes from internal sources (within the program/ department)? ___
11. What percent of funding comes from appropriated state funding or other external sources? ___
- 1 2. Do you presently have any FAA Airway Science Program funding? ___
- 1 3. Have you had any FAA Airway Science Program funding in the past? ___

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14. What is your average teaching workload by credit hours for a full-time faculty member? ___
- 1 5. How many aviation curriculum options and/or majors do you offer? What are they? _____

16. To what degree do you feel your program is a central part of your college's and/or university's mission? _____
17. Is the aviation program a separate department? __
18. What is your FAA flight checkride first attempt pass/fail rate for each of the following checkrides? private __ commercial __ instrument __ CFI __ CFII __ MEI __
19. Is the aviation program's office space suitable? __
20. Are salaries of faculty members comparable to other departments on campus? about the same? _____ higher? __ lower? __
21. Do you feel you have adequate financial support? __ adequate technological support? __

Please enclose a copy of your aviation program's flight costs for private, commercial, instrument, CFI, CFII, and MEI (if applicable)

THANK YOU FOR YOUR COOPERATION IN MY DISSERTATION STUDY. IT IS GREATLY APPRECIATED!!

APPENDIX T

PHASE TWO QUESTIONNAIRE MEANS

TABLE Ti. Means ± Standard Deviations for Comprehensive Indicators of Quality As Rated by Students (N = 447)

	Environment for Learning	Scholarly Excellence	Quality of Teaching	Faculty Concern for Students	Curriculum	Departmental Procedures	Available Resources
High Quality Programs (N=268)	2.80 ± .60	3.01 ± .49	2.95 ± .42	2.92 ± .48	2.54 ± .48	2.56 ± .46	2.79 ± .54
	3.05 ± .57	3.01 ± .49	2.91 ± .67	2.88 ± .54	2.64 ± .76	2.66 ± .53	2.57 ± .76
	2.94 ± .09	3.18 ± .23	3.11 ± .24	2.72 ± .38	2.70 ± .26	2.93 ± .29	2.40 ± .45
1	2.80 ± .60	2.75 ± .55	2.86 ± .54	2.88 ± .50	2.57 ± .65	2.46 ± .53	2.67 ± .66
2	3.00 ± .28	3.04 ± .17	3.03 ± .22	3.05 ± .33	2.47 ± .42	2.43 ± .32	3.11 ± .47
3	2.94 ± .37	2.95 ± .40	2.97 ± .40	2.91 ± .49	2.65 ± .52	2.64 ± .45	2.98 ± .42
4							
5							
6							
Intermediate Quality Programs (N=135)	3.03 ± .40	2.89 ± .50	2.89 ± .37	3.08 ± .44	2.41 ± .57	2.58 ± .46	2.06 ± .56
	3.47 ± .27	3.47 ± .21	3.39 ± .52	3.50 ± .39	3.06 ± .60	3.02 ± .32	2.45 ± .79
	3.60 ± .32	3.48 ± .23	3.43 ± .40	3.55 ± .48	2.93 ± .52	3.43 ± .36	2.29 ± .23
1	2.87 ± .47	2.60 ± .66	2.56 ± .68	2.78 ± .59	2.25 ± .80	2.36 ± .63	2.48 ± .62
2	3.22 ± .33	3.35 ± .41	3.19 ± .52	3.13 ± .50	2.72 ± .51	2.94 ± .52	2.47 ± .58
3							
4							
5							
Low Quality Programs (N =44)	3.10 ± .42	3.00 ± .85	3.08 ± .59	3.25 ± .00	2.50 ± .00	2.93 ± 1.10	2.71 ± .20
	3.45 ± .30	2.96 ± .43	3.13 ± .46	3.25 ± .47	2.47 ± .40	2.74 ± .62	2.03 ± .37
	2.73 ± .36	2.60 ± .37	2.57 ± .51	2.56 ± .47	2.08 ± .64	2.39 ± .54	2.03 ± .55
1	2.80 ± .16	2.45 ± .25	2.83 ± .33	3.25 ± .43	2.67 ± .41	2.79 ± .44	2.20 ± .45
2	3.15 ± .57	3.43 ± .29	3.33 ± .39	3.13 ± .54	2.58 ± .47	2.63 ± .69	2.48 ± .60
3	3.30 ± .42	3.20 ± .85	3.25 ± .35	3.75 ± .35	2.83 ± .71	2.93 ± .51	1.14 ± .20
4							
5							
6							

Student data reported from only five programs due to questionnaires lost in the mail from one program.

TABLE T2. Means ± Standard Deviations for Comprehensive Indicators of Quality As Rated by Faculty (N = 167)

	Environment for Learning	Scholarly Excellence	Quality of Teaching	Faculty Concern for Students	Curriculum	Departmental Procedures	Available Resources
High Quality Programs (N=119)	3.23 ± .43	3.10 ± .55	3.29 ± .59	3.30 ± .61	3.05 ± .49	3.18 ± .55	2.83 ± .63
	2.86	2.89 ± .34	2.45 ± .45	2.78 ± .45	2.33 ± .53	2.42	2.03 ± .61
			3.20 ± .07	2.84 ± .13	2.71 ± .08	± .38	3.10 ± .31

1	±.27	3.21 ±.17	2.76 ±.40	3.11 ±.32	2.93 ±.19	2.90	2.41 ±.41
2	3.15	2.77 ±.14	3.25 ±.35	3.13 ±.18	2.58 ±.12	±.27	2.64 ±.51
3	±.09	3.00 ±.28	2.65 ±.51	3.17 ±.44	2.62 ±.86	2.61	2.70 ±.60
4	2.89	2.75 ±.54				±.48	
5	±.51					2.57	
6	3.30					±.40	
	±.71					2.79	
	2.98					±.68	
	±.42						
Intermediate Quality Programs (N=31)	3.10 ±.14	2.70 ±.14	2.75 ±.35	3.00 ±.35	2.17 ±.24	2.71 ±.20	1.57 ±.20
	3.00	2.87 ±.12	3.11 ±.10	3.25 ±.25	2.72	3.00	2.14 ±.14
	±.40	3.60 ±.00	3.33 ±.00	3.25 ±.00	±.51	±.62	2.43 ±.00
1	3.60	2.90 ±.14	2.33 ±.24	3.13 ±.53	2.17	2.86	1.79 ±.51
2	±.00	3.00 ±.48	3.29 ±.28	3.42 ±.46	±.00	±.00	2.84 ±.47
3	3.00	2.80 ±.00	3.50 ±.00	3.50 ±.00	2.17	2.72	1.86 ±.00
4	±.57				±.00	±.81	
5	3.58				3.19	3.21	
6	±.23				±.36	±.36	
	3.60				1.00	2.43	
	±.00				±.00	±.00	
Low Quality Programs (N=17)	3.00 ±.00	3.00 ±.00	3.00 ±.00	3.25 ±.00	2.83 ±.00	3.00 ±.00	2.29 ±.00
	3.04	2.96	2.80 ±.42	3.20 ±.65	1.73 ±.37	2.46	1.77 ±.46
	±.46	±.17	2.50 ±.00	3.25 ±.00	2.50 ±.00	±.14	2.00 ±.00
1	3.00	2.80	3.22 ±.38	3.00 ±.50	3.00 ±.00	3.57	2.76 ±.58
2	±.00	±.00	3.83 ±.29	3.83 ±.29	3.28 ±.25	±.00	3.00 ±.52
3	3.07	3.13	2.17 ±.00	3.00 ±.00	2.33 ±.00	2.71	0.86 ±.00
4	±.50	±.61				±.29	
5	3.73	3.20				3.29	
6	±.31	±.60				±.29	
	3.20	2.60				2.14	
	±.00	±.00				±.00	

TABLE T3. Means ± Standard Deviations for Comprehensive Indicators of Quality As Rated by Alumni (N = 577)

	Environment for Learning	Scholarly Excellence	Quality of Teaching	Faculty Concern for Students	Curriculum	Departmental Procedures	Available Resources
High Quality Programs (N=286)	3.05	3.15	3.16 ±.5	3.22 ±.5	2.64	2.67 ±.4	3.03 ±.52
	±	±	2.77 ±.5	2.78 ±.5	±	2.24 ±.5	2.70 ±.52
	.432.91	.402.76	3.22 ±.5	3.11 ±.5	.632.44	2.61 ±.6	2.92 ±.76

1	±	±	2.79 ± .37	2.80 ± .4	±	2.27 ± .5	2.67 ± .6
2	.473.10	.553.17	2.82 ± .41	2.97 ± .4	.612.32	2.25 ± .3	2.89 ± .37
3	±	±	2.81 ± .5	2.97 ± .6	±	2.42 ± .5	3.10 ± .48
4	.432.88	.642.68			.772.60		
5	±	±			±		
6	.462.90	.613.04			.662.11		
	±	±			±		
	.242.97	.482.82			.532.44		
	± .37	± .53			± .58		
Intermediate Quality Programs (N =154)	2.80 ± .53	2.48 ± .71	2.78 ± .54	2.83 ± .59	2.14	2.27 ± .7	2.29 ± .49
	2.74 ± .34	2.40 ± .51	2.62 ± .66	2.79 ± .39	±	2.10 ± .4	1.90 ± .10
793.05	...	2.57 ± .00
1	2.81 ± .37	2.52 ± .49	2.45 ± .41	2.56 ± .54	± .71	2.11 ± .	2.03 ± .57
2	3.30 ± .24	3.17 ± .27	3.28 ± .40	3.37 ± .46	3.00	3.05 ± .	2.77 ± .59
3	3.20 ± .37	3.35 ± .44	3.29 ± .64	3.20 ± .51	±	2.71 ± .4	2.07 ± .55
4					.001.96		
5					±		
6					.502.86		
					±		
					.622.71		
					±		
					.21		
Low Quality Programs (N=137)	2.72 ± .56	3.00	2.96 ± .72	3.21 ± .	2.63	2.46	2.48 ± .6
	...	±	4.00 ± .0	4.00 ± .0	±	±	3.71 ± .00
	2.86 ± .36	.574.00	2.71 ± .5	2.57 ± .6	.593.83	.563.71	2.14 ± .59
1	2.74 ± .63	±	2.73 ± .5	2.79 ± .6	±	±	2.02 ± .54
2	2.84 ± .51	.002.74	2.62 ± .62	2.80 ± .6	.002.45	.002.14	2.10 ± .61
3	3.20 ± .85	±	3.25 ± .8	3.13 ± .5	±	±	2.79 ± .3
4		.222.63			.652.14	.592.21	
5		± .64			±	±	
6		2.71			.532.23	.642.16	
		±			±	±	
		.493.30			.852.17	.622.64	
		± .99			± .00	± .51	

unable to compute mean due to no response

TABLE T4. Means ± Standard Deviations for Specific Indicators of Quality As Rated by Students (N = 447)

	Student Satisfaction	Internship! Fieldwork	Resource Accessibility	Student Accomplishments	Students Average Mean Tables T1 & T4 Combined
High Quality	3.15	3.14 ± .1	2.33	.41 ± .12 .45	2.60

Programs (N=268)	± .803.35	3.25 ± .4 3.07 ± .6	± .632.62	±.16 .22 ± .13 .38 ±	± 2.67
1	± .713.43	3.14 ± .3	± .762.25	.16 .50± .16	± 2.63
2	± .372.90	2.64 ± .7 3.23 ± .2	± .312.16	.41± .16	± 2.51
3	± .853.15		± .752.60		± 2.64
4	± .553.43		± .64		± 2.68
5	± .43		2.37 ±.56		
6					
Intermediate Quality Programs (N=135)	3.13 ± .61 3.50 ± .69	2.80 ± .40 2.71 ± .20	2.51±.802.78 ±.582.80	.46 ±.14 .53 ±.13 .46 ±	± 2.53
1	3.75 ± .35	2.86 ± .00	±.962.41	.11 .46 ±	± 2.90
2	2.83 ± .72	2.86 ± .33	±.902.69	.21 .53 ±	± 2.96
3	3.51 ± .45	3.00 ± .31	±.54	.19	± 2.41
4					± 2.80
5					
Low Quality Programs (N =44)	3.63 ± .533.30 ± .332.87	2.71 ± .00 2.86 ±.00	3.00±.002.47 ±.562.07 ±.531.73	.42 ±.05 .34 ±.12 .40 ±	± 2.76
1	± .583.25	2.56 ±.49	±.552.17 ±.813.17	.19 .37 ± .1.7	± 2.64
2	± .533.33	2.58 ±.50	±.12	.50 ± .18 .62 ±	± 2.27
3	± .473.50	3.19		.22	± 2.45
4	± .71	±.33			± 2.72
5					± 2.70
6					

student data reported from only five programs due to questionnaires lost in the mail from one program.

TABLE T5. Means ± Standard Deviations for Specific Indicators of Quality As Rated by Faculty (N = 167)

	Faculty Work Environment	Faculty Program Involvement	Faculty Research Activities	Faculty Professional Activities	Faculty Average Mean Tables T2 & T5 combined
High Quality Programs (N=119)	3.20 ± .50 2.58 ± .32 2.99 ± .09	1.83 ± .431.54	1.76 ± .291.85	1.68 ± .291.84	2.77 2.32 2.67 2.60 2.67 2.50
1	2.79 ± .58	± .731.95	± .271.81	± .221.47	
2	3.11 ± .47	±	±	±	
3	2.61 ± .39	±.312.57	±.171.97	±.351.74	

4		±	±	±	
5		.002.14	.081.70	.402.00	
6		±	± .141.78	±	
		.001.81	± .19	.001.60	
		± .58		± .32	
Intermediate Quality Programs (N =31)	2.89	2.29	2.00	1.70	2.44
	±	±	±	±	±
	.003.20	.812.43	.001.93	.421.87	2.69
1	±	±	±	±	2.74
2	.552.56	.002.29	.122.00	.122.00	2.41
3	±	± .00	±	±	2.81
4	.002.17	2.71	.001.80	.001.80	2.32
5	±	± .40	±	±	
6	.713.40	1.75	.281.75	.001.53	
	±	± 1.15	± .282.00	±	
	.212.56	0.71	± .00	.321.60	
	± .00	± .00		± .00	
Low Quality Programs (N=17)	3.00	1.86	2.00 ± .0	1.60	2.53
	±	±	1.80 ± .2	±	2.23
	.002.85	.001.29	1.60 ± .0	.001.60	2.30
1	±	±	1.93 ± .	±	2.58
2	.532.67	.003.00	1.93 ± .1	.281.40	2.89
3	±	±	2.00 ± .0	±	2.08
4	.003.11	.001.62		.001.87	
5	±	±		±	
6	.443.63	.332.36		.231.73	
	±	±		±	
	.062.67	.912.14		.121.80	
	± .00	± .00		± .00	

TABLE T6. Means ± Standard Deviations for Specific Indicators of Quality As Rated by Alumni (N = 577)

	Student Satisfaction	Internship! Fieldwork	Employment Assistance	Alumni Average Mean Tables T3 & T6 combined
High Quality Programs (N=286)	3.13 ± .79	2.95 ± .17	1.26 ± .75	2.83
	3.03 ± .71	2.73 ± .84	1.35 ± .59	2.57
	3.36 ± .70	3.17 ± .37	1.56 ± .64	2.85
1	2.62 ± .76	2.67 ± .79	0.92 ± .57	2.49
2	2.93 ± .57	2.94 ± .52	1.31 ± .57	2.57
3	2.93 ± .68	3.36 ± .30	1.33 ± .57	2.72
4				
5				
6				
Intermediate Quality Programs (N = 1541)	2.65 ± .91	2.57 ± .46	1.62 ± .85	2.44
	2.36 ± .75	2.46 ± .74	1.29 ± .50	2.27

1	---	---	1.60±.00	---
2	2.65 ± .66	2.62 ± .41	0.94 ± .64	2.27
3	3.28 ± .54	3.31 ± .29	1.45 ± .92	2.98
4	3.25 ± .35	2.68 ± .76	1.35 ± 1.0	2.78
5				
6				
Low Quality Programs (N = 137)	3.27 ± .74	3.04 ± .68	1.58 ± .49	2.74
	4.00±.00	---	---	---
	3.00 ± .58	2.57 ± .00	1.60 ± .10	2.51
1	2.69 ± .76	2.32 ± .69	1.27 ± .35	2.35
2	2.88 ± .75	2.65 ± .72	1.51 ± .53	2.46
3	3.63 ± .18	3.43 ± .00	1.80 ± .00	2.93
4				
5				
6				

unable to compute due to no response

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To: Faculty

From: S.A.A.C

Date: October 25,1999

Subject: ALPA Seminar

S.A.A.C was wondering if you could announce that the



ALPA

Seminar that will be held in Clifford Hall Room 210,
November
2, 1999, at 7:00pm.

The seminar will consist of 3 pilots. A captain from Delta
and United, plus a captain from a regional carrier.

We would greatly appreciate it if you could announce this
for Us.

Thank you,

S.A.A.C

Flight Training for U.S. Commercial Pilot Applicants:
Should Aerobatic Training be Mandatory?
Thesis Progress Report
Joe Vacek

- Thesis Credits Fall 02: Avit 499 2cr, Hon 489 3cr.
- Literature review: 80% complete. My argument is clearly laid out, need to clarify opposing argument(s) to weigh. This section will have minor additions and changes throughout the entire project.
- Cost Analysis: 25% complete. Economic data in a geographical framework gathered, need to integrate this in my argument and rationalize the costs.
- Survey: 90% complete. Rough draft complete, need to submit formal proposal to IRB.
- Data: 0% complete. Need to administer survey in November-December timeframe.
- Conclusion: 0% complete. I will analyze data and get results next semester.
- Thesis Credits Spring 03: Avit 499 3cr, Hon 489 3cr.

- Please refer to my Journal, Survey, Cost Analysis, and Thesis rough drafts for more detail.