

A STUDY OF CAREER CHOICE FACTORS
AND STUDENTS' ACADEMIC SUCCESS
AT AN AVIATION SCHOOL

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CHAPTER I

INTRODUCTION

Background

Academic success in college may be defined in different ways. In *The College Success Book: A Whole-Student Approach to Academic Excellence*, Groccia (1992) wrote, “Attaining academic success requires that you become flexible in your study habits and learn to modify them to fit new learning environments” (p. 3). Browne and Keeley (1997) have suggested that the right attitude and good strategies combine to equal excellence in college. Then, the question arises; can “academic success” be defined in terms other than excellence?

Kuh, Kinzie, Schuh, Whitt, and associates (2005) advised there is no single blueprint for student success. “The institutional mission statement should emphasize and define what student success means in the local context” (p. 299). Kuh et al. believed “students who cannot discern meaning from their college activities often report academic difficulty or social isolation, and are at risk of leaving school” (p. 109).

Former New York Yankee baseball Hall of Fame catcher Yogi Berra has been quoted as saying, “You got to be careful if you don’t know where you’re going, because you might get there” (1998, p. 102). Groccia (1992) linked academic success to goal achievement and advised students:

Having career goals helps provide direction and focuses your attention on attainable outcomes of the educational process. Knowing where you are going with your academic program, in terms of clear goals, helps stimulate and maintain motivation. Motivation has been shown to be a critical component of academic success. Therefore, clarifying your career goals can result in immediate as well as long-term gain. (p. 46)

Berra added, “If you don’t set goals, you can’t regret not reaching them” (p. 103).

Webster defined to succeed as “to accomplish something desired or intended” (Webster’s II New Riverside University Dictionary, 1984). Schools have established policies to help insure that students are successful in achieving their goals. In such a policy, The University of Maryland (2004, para. 1) stated, “The goal of the Student Academic Success-Degree Completion Policy is to promote undergraduate student success.” The policy requires students to complete required courses, have appropriate grades, and meet certain progress benchmarks. This will allow “all students to demonstrate continuing progress in their majors” (para. 2).

The U.S. Department of Education has defined satisfactory academic progress in the Code of Federal Regulations (CFR). Institutions who desire to participate in the Title IV, Higher Education Assistance program are required to have a standard that insures undergraduate students complete their program of study in no more than 150 percent of the published length of the educational program. At the same time, students must demonstrate acceptable grades or completion of work projects (Code of Federal Regulations, 34CFR668.16). Lincoln University of Missouri, which has such a program, states “The mission of Academic Success and Student Retention is to provide academic support using a comprehensive array of activities and services to assist students throughout their journey to a successful graduation” (2006, Mission Statement).

Students who wish to succeed in college must take an active role in their learning, according to Browne and Keeley (1997). To be an active learner, the student must stay in school. This links academic success directly to persistence. However, more college students leave college without completing a degree than those who graduate (Tinto,

1993). Tinto pointed out that there are serious consequences for both students who drop out of college, and for their schools.

Dr. Boyce Watkins, who earned a Ph.D. from The Ohio State University, also tied academic success to persistence. In explaining why he believes he was a successful student in college he said, “I sometimes failed tests, I received bad grades from time to time, and there were periods when I endured intense humiliation. But I persisted...” (2004, pp. 1-2). Dr. Watkins added, “...you have to go into the situation ready to work as hard as you can to solve your problems and reach your goals. Never ever give up, because giving up is the only way to guarantee that you have NO CHANCE to be successful” (p. 46).

One benefit of persistence and completing a college degree is access to higher paying, and more prestigious careers. The National Center for Educational Statistics (2006) reported that in 2004 males between the ages of 25 and 34 who completed the bachelor’s degree or higher had annual earnings 67% higher than a male high school graduate. This is an increase from a 19% advantage in 1980. Females with a bachelor’s degree or higher, earned 68% more than females with a high school diploma, or the equivalent.

Prior to 1990, most research into the problem of student retention focused on four-year institutions. However, Pascarella and Terenzini (2005) found that 40 percent of students enrolled in college in the U.S. are now attending community colleges. Thus, community colleges are greatly impacting career training, and this includes training for a career in aviation.

Less than 20 percent of the schools certificated by the Federal Aviation Administration to train pilots and maintenance technicians are identified as universities or colleges. Another eight percent of aviation programs are taught in community colleges; the majority of these programs are for training aircraft maintenance technicians (U. S. Department of Transportation, Federal Aviation Administration [FAA], 2006). This suggests that more than two-thirds of the students entering aviation training are not degree seeking students. Still, they are completing “some college” and the National Center for Educational Statistics report showed that students completing “some college” have greater earnings than high school graduates (see Table 1).

Table 1
*Median Annual Earnings of Full-time, Full-year Workers Ages 25-34
 Selected Years, 1980 – 2004*

	1980	1985	1990	1995	2000	2004
Male Totals	\$40,600	\$39,100	\$36,700	\$34,200	\$37,800	\$36,300
High school graduate	38,800	35,200	32,000	29,700	32,300	30,400
Some college	40,800	39,800	37,600	33,000	38,000	36,400
Bachelor’s degree or higher	46,300	48,200	46,000	46,400	50,900	50,700
Female Totals	27,600	29,100	28,900	27,500	30,100	31,000
High school graduate	25,500	25,000	23,700	21,800	23,500	24,000
Some college	27,800	28,900	29,000	26,700	27,800	28,800
Bachelor’s degree or higher	34,100	36,900	38,800	37,300	39,900	40,300

Note: Earnings in constant 2004 dollars. Adapted from “Economic Outcomes: Annual Earnings of Young Adults,” National Center for Educational Statistics, 2006, *The Condition of Education 2006*, (supplemental table 22-1).

Attending college can have more than an economic impact on students. Pascarella and Terenzini (2005) listed several areas where college changes students. These include, “learning and cognitive change, psychosocial changes, attitudes and values, and moral

development” (p. 572). Westbrook (1991) wrote that the shaping of character, “the moral and political agenda of schooling, is sometimes termed the ‘hidden curriculum’” (p.104). Pascarella and Terenzini believed that these attempts to change students may be positive or negative. If students do not share the views of peers and faculty, and view them as contrary to their personal goals, the students may ultimately withdraw. This can lead to high attrition rates.

When attrition is high, loss of revenue may hit proprietary schools hard if the schools are tuition driven. Accrediting bodies monitor completion rates at schools and may impose probation, or worse, on schools where attrition is excessive. Failure to meet Department of Education standards for academic performance may result in a school becoming ineligible for student financial aid (Accrediting Commission of Career Schools and Colleges of Technology [ACCSCCT], 2006). Such action could be catastrophic for a proprietary school. According to Tinto (1993), “Some institutions, primarily the smaller tuition-driven colleges, have teetered on the brink of financial collapse. Indeed, many have closed their doors in recent years with many more predicted to follow suit” (p. 2).

In many cases a third group is adversely affected by a high student drop-out rate. Employers may rely on schools to provide the highly skilled workers needed in industries such as aviation. “Collegiate training...is already the major training route for certificated maintenance technicians and is likely to become an increasingly important pathway for pilots as military training opportunities decline” (Hansen & Oster, 1997, p. 81). When schools fail to produce enough qualified graduates, it may force companies to compete for new employees to fill job openings. This competition can drive up the price of labor, the largest expenditure in most companies. For example, Byars and Rue (2000) found

that government reports indicate approximately 72 percent of national income is used to compensate employees.

Student attrition is a problem at aviation schools also. The Federal Aviation Administration (1996) estimated that approximately fifty percent of students who entered aviation maintenance training completed the training. Attrition at the school in this study has consistently been above sixty percent for the past ten years (Dean of College Programs, personal communication, July 21, 2003). In 2006 the school reported to an advisory panel that of 77 students starting a program in one year, 48 students withdrew.

Statement of the Problem

While this researcher found no industry-wide report on student attrition, the school in this study reported completion rates from only 22% to 56% for the programs offering Associate of Applied Science degrees. Three of the programs reported completion rates that are below the standards for accreditation established by the ACCSCT (personal communication, Senior Vice-President for Education, March 7, 2007). In addition, the reasons why students choose to leave school are not fully understood. To be successful, students must remain in school. As Watkins (2004) stated, dropping out of college is a sure way to guarantee that the student will not succeed. Without understanding the reasons for student attrition at aviation schools, it is impossible to improve retention rates and address the negative effects on these important industry training providers.

Purpose of the Research

The purpose of this study was to describe the reasons why students choose careers in aviation as a pilot, or as an aircraft technician (airframe and powerplant or aviation

electronics), and to determine if there is a relationship between the reasons for career choice and student academic success in aviation training, when “academic success” is defined as program completion.

Important as it is to reduce student attrition, before the problem can be solved the reasons why students choose to leave school, or choose not to persist, need to be better understood. Tinto (1993) stated that until the reasons for students departing were understood, it would be difficult to determine what helped students to persist in their training. However, Moxley, Najor-Durack, and Dumbrigue (2001) stated that retention is more than keeping students in school. “It is also about helping each student develop as a successful student...” (p. 192).

Kuh et al. (2005) claimed that the best predictors of student success are academic preparation and motivation. Prior studies have shown student academic success to be positively correlated with student motivation. Covington (2000) urged more research be done in the area of student achievement and motivation. Covington asserted that little is understood concerning the relationship between students’ personal goals and motivation. Why a student chooses one goal (for example a career in aviation) over others was not clear. Achievement goal theory suggests that students who valued what was being learned (and therefore what was being taught) would be more likely to succeed in their studies.

Research Questions

To better understand the reasons why some students choose to persist in their training, certain general questions need to be addressed: (a) What factors influenced students when they made the decision to pursue a particular career goal? (b) Why did

students then choose to change their career goals? (c) How did the reasons that formed the basis for choosing that career relate to the students' success in their field of training?

This line of reasoning suggested the following research questions which guided this study:

1. What are the reasons participating students had for choosing to pursue a career in aviation as a pilot or as an aviation technician (airframe and powerplant or aviation electronics)?
2. What are the academic success rates of the participants in this study?
3. Is there a relationship between the reasons for the students' aviation career choice and their academic success?

Rationale for a Mixed-Method Study

This study used a mixed-method empirical design that incorporated both quantitative and qualitative data gathering and analysis techniques. Shavelson (1996) defined the broad purpose of empirical research in the behavioral sciences as a method to “provide answers to questions about behavior by using the scientific method” (p. 4).

Shavelson added that “the purposes of behavioral research, in more specific terms, are to **describe**, **predict**, and **control** behavior” (p. 5). In this study, the descriptive purpose was served by the quantitative data from the research survey. Shavelson also pointed out that the scientific method, which is generally associated with the quantitative research method, is not the only possible way of conducting research.

Departing from the quantitative model, Mertens (1998) listed three reasons for the selection of qualitative methods for research. One reason is that qualitative methods may be used to add depth to a quantitative study. This study involved a small sample and

examined students' reasons for choosing one career over others. It described reasons why students make career choices, and did not attempt to predict or control behavior. The desire to investigate and describe more deeply the reasons for students' career choices prompted the addition of qualitative techniques to this study.

When Braxton (2000b) wrote that research into the problem of student retention should be both qualitative and quantitative, he did not exclude possible studies using only qualitative or only quantitative methods. However, Crotty (1998) pointed out, "Our research can be qualitative or quantitative, or both qualitative and quantitative, without this being in any way problematic" (p. 15).

This study used data from a survey to describe reasons students chose careers in aviation, a quantitative procedure. In addition, qualitative interviews were used to add more detailed reasons about why students chose to persist in their training. This researcher chose a mixed-method study in the belief that qualitative methods would add depth to the quantitative element of the study.

Theoretical Framework

This study examined reasons for choosing a career in aviation, academic success rates of aviation students, and the relationship between these variables. It was grounded in the assumption that students must persist to be successful in an academic pursuit and that their goals and attitudes are factors in this persistence.

Vincent Tinto, who is recognized as one of the leading researchers in the area of student retention and departure, hypothesized (1993) that for students to persist in college, they must be successfully integrated into the internal social communities of the institution. Braxton (2000b) extended Tinto's theory to add the integration effects of

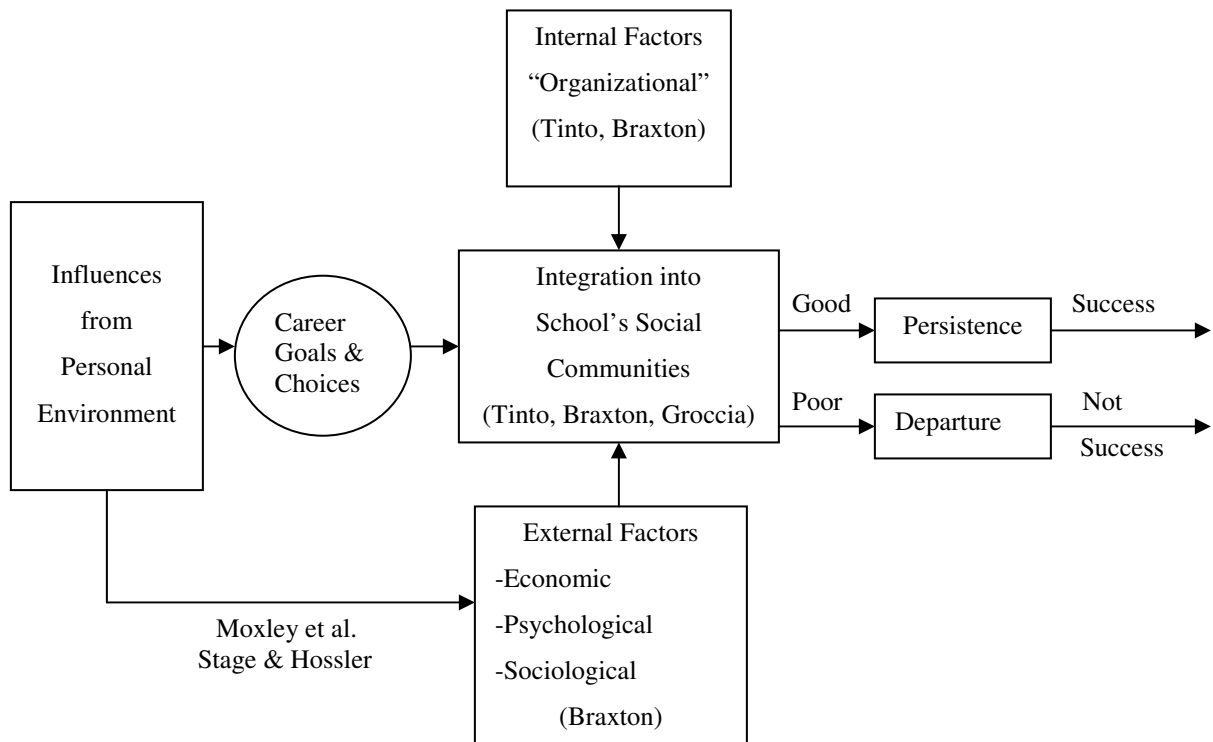
external communities and student characteristics on academic persistence. He posited that influences on college student persistence and departure decisions were derived from four theoretical frameworks: economic, organization, psychological, and sociological.

In Tinto's terms, Braxton's organizational framework can be viewed as internal, while his economic, psychological, and sociological frameworks can be viewed as external. According to Braxton, these four sources impact students' social integration and thus their decision to persist or depart from an academic program. Moxley et al. (2001) agreed with Braxton's stance that influences on social integration, and thus on persistence decisions, could be external to the college institution. They specifically related external communities directly to career decision, explaining that these associations could help students make career decisions and to realize the value of their education.

Several other theoretical positions support the relationship proposed by Moxley et al. (2001) that external influences and factors impact students' career choices and decisions. Groccia's (1992) position was that students' externally-acquired attitudes and expectations affect the outcome of their college experience and that "students who are pursuing identified majors and following career paths find it easier to adjust to the academic, social, and emotional demands that come with college life" (p. 41). In terms of the persistence theories of Tinto (1993) and Braxton (2000b), external influences affect the career choices of students, but once these choices are made, students are more successful in integrating into the school's internal community, which, in turn, facilitates persistence to successful completion of the career training program.

Stage and Hossler (2000) agreed that students' externally-acquired views of self are related to their academic success. They also believed there is a relationship between

students' goals and their success in college and that how students have gathered information about college and careers may be linked to retention. They proposed that the effects of external influences such as parents, teachers, and friends on students' career choices may play a role in students' "subsequent satisfaction, and possibly ultimate persistence" (p. 182). Braxton (2000b) related this notion to the theoretical position he shared with Tinto by suggesting that these career influences and choices may help explain how students may be integrated into the social communities of the school, such as student organizations, professional organizations, and community groups. The level of success of this integration influences, in turn, students' decisions to persist in or depart from their career training programs.



*Figure 1
Theoretical and Conceptual Framework for the Study*

The interrelationships of these various theoretical positions in a theoretical framework for this study are shown in Figure 1. The conceptual logic of this framework led the researcher to the substantive hypothesis that relationships would be found in this study between the reasons students made a decision to enter an aviation career (i.e. the factors that influenced that decision) and their persistence or academic success in an aviation training program. If such relationships exist, then understanding how students have arrived at this career goal may aid in predicting if they will be successful.

Researcher Perspective

Rossmann and Rallis (2003) asserted that researcher bias can never be eliminated. This researcher has worked for over 50 years in aviation, over 25 years as an instructor and administrator at the school where students were selected for this study. As a result, the researcher entered the study with certain ideas about what characteristics students should possess to be successful in their training. However, it was recognized that these expectations could be erroneous and that factors which the researcher considered significant may not actually be important. It was felt that the qualitative portion of this study would allow participants to fully express their ideas about what makes a student successful, but that care would be required to avoid personal bias in analyzing the interpretivist data.

According to Rossmann and Rallis (2003), researchers must know their beliefs and be certain about the purposes of their research. Researchers must be “constantly self-conscious about [the researcher’s] role, interactions, and empirical material as it accumulates. As long as qualitative researchers are reflexive, making all their purposes explicit, then issues of reliability and validity are served” (as cited in Delamont, 1992,

p. 8). In analyzing the data in this study, the researcher was fully aware of personal expectations grounded in personal experience and used this awareness to mitigate potential biased interpretation.

Similarly, Rubin and Rubin (1995) cautioned that interviewers must understand themselves to properly interpret what they hear. They wrote:

By being aware of your own specialized vocabulary and cultural assumptions, you are less likely to impose your own opinions on the interviewees. It is the interviewee's ideas you want to hear, and you don't want to block that communication by putting your own assumptions in the way. (p. 19)

Again, by being aware of potential personal biases and expectations, the researcher guarded against imposing his beliefs on the participants interviewed in this study.

Limitations of the Study

Shavelson (1996) explained that a sample may be selected because it is convenient or readily available. The sample in this study was a convenience sample, selected because it was available and accessible, and allowed the researcher to operationalize the study. It consisted of students who were enrolled in only one aviation school during a specific period of time. Cornfield and Tukey (1956) stated that such a sample limits the external validity of the study. While the results may be generalizable to all of the students in the school used in this study, the results may not be valid for other aviation schools. Additional studies should be done, drawing from a broader population, before attempting to generalize the findings of this study to other aviation students in other institutions.

The quantitative portion of the study was conducted by mail and the return rate determined the final sample size. This final sample was small ($N = 57$), which affected the internal validity of the study as well as its external validity. A third limitation was that

the sample was volunteer, or self-selected. This may have affected the external validity in ways unknown to the researcher.

The type of respondents may also have been a factor in determining external validity. Students whose educational experience was more positive may have been more likely to respond. The accuracy of the study may have been limited if the self-reported data were not truthful. Because the school in this study had a student base that was nationwide, students from different locales may have had different ideas about the meaning of academic success. This could mean that the sample was biased, which limited the external validity of the study, specifically its population validity. Because both completers and non-completers participated in the qualitative portion of the study, these issues were hopefully adequately addressed.

Definitions Related to the Study

The following operational definitions were applied in this study:

Attrition: A student leaving the college without completing the program in which they were enrolled.

Aviation training: Programs in flight training, aviation maintenance technician, and aviation electronics technician.

Completer: A student who successfully completes a program leading to an associate's degree at the college in this study.

Completion: A student successfully completing a program leading to an associate's degree in which they were enrolled at the college in this study.

Maximum completion time: The time equal to one and one-half times a student's program length stated in the school's applicable catalog. Maximum

completion time is determined by the U.S. Department of Education for schools participating in federal student loan programs.

Non-Completer: A student who enrolled in a program leading to the associate's degree and either graduates without a degree, or who leaves the college without completing any program of study.

Student academic success: Completing an initial program within the required maximum completion time.

The school: A post-secondary, private technical school located in Oklahoma offering certificate programs in aviation training, Associate of Applied Science degrees, and a Bachelor of Science in Aviation Technology Management.

Summary and Overview of the Study

This study investigated the reasons for the choice of an aviation career, and whether those reasons had a relationship with academic success in the students' chosen field of training. This study was conducted using a mixed-method design combining quantitative and qualitative methods, specifically a survey conducted by mail and telephone interviews.

A researcher-developed questionnaire was mailed to all of the students who enrolled at the participating school in 1999 and 2000, to determine the reasons they chose aviation training. This time frame was chosen for two reasons: (a) these students would have had time to successfully complete their programs, and (b) recent addresses for those students were more likely to be valid.

The population for this study was all the students who enrolled in one of the three Associate Degree programs in aviation training at the participating school in these years.

These three programs included both flight training and aviation maintenance training. These students had either completed, or dropped from one of these programs, before the beginning of this study. The sample for the study was defined as members of the population who actually completed and returned the research questionnaire (N = 57).

Participants were asked to provide a contact number if they were willing to participate in the interview portion of the study. The returned questionnaires were divided into two groups: students who successfully completed their training (completers) and those who did not (non-completers). Three participants from the completers group and three from the non-completers group were randomly selected from the returned questionnaires and asked to participate in follow-up interviews. The interviews sought to explore in more depth the similarities and differences in the reasons for career choices between completers and non-completers.

Data from the questionnaires were analyzed using descriptive statistical methods. No attempt was made to generalize the findings to other groups. A Likert-like scale was used to rate the reasons respondents gave for their choice of aviation as a career. Ratings were then compared in an attempt to determine any differences between completers and non-completers.

Qualitative research questions utilized in the interview portions of this study provided more insight into problems students encountered in the college community, and how they were able, or unable, to overcome these problems. Braxton's (2000b) four theoretical frameworks were used to categorize reasons respondents gave for choosing aviation as a career and why they persisted or departed from their training.

All personal information obtained concerning the students remained confidential

and their identities were fully protected. Data remained locked in a file off the school's campus and was not available to school officials. Participants were provided with the results of the study at their request.

Significance of the Study

This researcher hypothesized that there is a possible relationship between certain factors in aviation career choice and student academic success. The significance of this study was in determining what factors influence students choosing a career in aviation, and which factors are related to student persistence in their training. If the problem of student attrition were better understood, schools would be better equipped to initiate new programs that assist students in achieving their career goals. Moxley et al. (2001) explained that one challenge of retention is to understand students' educational aspirations, which relate to their reasons for making career choices.

This researcher found no industry-wide study that has investigated the relationship between career choice factors and success in aviation training. Hansen and Oster (1997) have cited reasons why minorities and women have been hesitant to enter the aviation industry. Clark (2006) has studied reasons women might choose a career in aviation. Sloan (2006) has published a study on the retention of Native Americans in collegiate flight training. However, no industry-wide located by this researcher has specifically examined the relationships of reasons for choosing an aviation career to success in training, when success is defined as persistence to completion. This study was intended to provide more insight into the connection between career choice and academic success in the aviation industry, which might, in turn, lead to career counseling that could increase student persistence and workforce development.

CHAPTER II
REVIEW OF LITERATURE

The school in this study is a private technical college offering certificates, diplomas, Associate of Applied Science and Bachelor of Science degrees. Programs of study at the college include a flight program and technical programs including Aviation Maintenance Technology (Airframe and Powerplant Mechanic), Avionics Technology, and Nondestructive Testing and Quality Control. Students can also earn a Bachelor of Science degree in Aviation Technology Management.

The college has a diverse student population from both the United States and many countries throughout the world. The Senior Vice-President for Education for the college (personal communication, March 7, 2007) reported the following demographics for the institution:

- Gender
 - Male 945 (93.6%)
 - Female 65 (6.4%)

- Ethnicity
 - American Indian 38 (3.8%)
 - Asian 35 (3.5%)
 - Black, Non-Hispanic 89 (8.8%)
 - Hispanic 122 (12.1%)
 - White, Non-Hispanic 716 (70.9%)
 - Non-Resident Alien 9 (0.9%)
 - Other 1 (0.09%)

- Program Type of Graduates
 - Diploma 193 (51.3%)
 - AAS Degree 154 (41.0%)
 - BS Degree 29 (7.7%)

The college enrolled students from 49 states and Puerto Rico in 2005-2006. The average age of the student was 23.4 years of age.

The college is nationally accredited by the Accrediting Commission of Career School and Colleges of Technology (ACCSCT) and is licensed by the Oklahoma State Board of Private Vocational Schools. The college has representatives in 25 states and must follow the requirements of the licensing agency in each state where it does business. Currently the college is owned by a company comprised of the existing management team.

The Problem of College Student Dropouts

In 1957 the Soviet Union launched Sputnik I, the first earth satellite. The Space Race, the Cold War, and globalization all put pressure on the United States to graduate students who excelled in mathematics, science, and technology. While these new forces focused on the student preparation issue, the issue was certainly not new. More than 50 years earlier, John Dewey had argued that for a child to become an effective member of a democratic society he must have “training in science, in art, in history; command of the fundamental methods of inquiry and the fundamental tools of intercourse and communications” (as cited in Westbrook, 1991, p. 94).

Because of Sputnik, universities were challenged to turn out more scientists. But as the decade of the 1950s began, American colleges saw a decline in enrollment. The GI Bill for World War II was coming to an end, and the Korean War took college age men who were potential students. While public education was feeling the effects of the baby boomers coming of school age in the 1950s, colleges would not see an increase in enrollment until the 1960s and 1970s (BookRags, 2006).

For the first 250 years of higher education history, student retention had not been an issue for American colleges and universities. Prior to 1900 few people needed a

college education and degree attainment was rare. Not until the 1960s did schools begin to monitor enrollments and student attrition. Rising enrollments, with diverse populations, and the pressure to graduate students who could meet the challenges of more complex curricula, caused researchers to start looking for answers to the problem of students dropping out of college (Berger & Lyon, 2005). After reviewing college attrition studies from the years 1950 to 1975, Pantages and Creedon (1978) wrote, “In terms of sheer numbers, the attrition problem deserves the attention of those interested in and affiliated with institutions of higher education” (p. 49).

Summerskill (1962) reported that the results of retention studies between 1913 and 1953 showed a mean loss of 50 percent of the entering classes in these studies. Only 37 percent of the students entering college in these studies graduated with a bachelor’s degree over a four-year period. Pantages and Creedon (1978) found that the studies they reviewed tended to support Summerskill’s findings, and suggested that colleges should consider ways to prevent attrition rather than trying to predict it.

Tinto (1975) stated that prior research into attrition had failed to explain the processes that led to an individual’s decision to not persist. This lack of understanding of the problem made it difficult for administrators to develop programs to assist students and reduce attrition. Tinto proposed a theoretical model that would explain the interactions between students and their institutions that might lead to the process of dropping out. Tinto’s “interactionalist theory” is well known. Tinto theorized that the greater the institution’s ability to integrate the student into the academic and social systems of the college, “the greater the likelihood the individual will persist in college” (Braxton 2000a, p. 3).

Braxton (2000a) questioned why the student departure rate had hovered around 45 percent for over 100 years when researchers had studied the problem over the past 70 years. Braxton was somewhat critical of the effects of Tinto's theory, claiming that "Research on the departure puzzle stalled in the mid 1990s because of the near-paradigmatic stature of Tinto's theory" (2000a, p. 7). But Tinto himself (1993) stated "much of what we think we know is wrong or at least misleading" (p. 3).

Berger and Lyon (2005) asserted that retention is a major policy issue in the twenty-first century. They stated that, "Retention efforts are well established on virtually every campus in the nation, retention is used as a key indicator of institutional effectiveness..." (p. 25). Retention rates are now one indicator used in measuring accountability in higher education (Berger & Lyon; Tinto, 2005).

The Accrediting Commission of Career Schools and Colleges of Technology (ACCSCCT) has been recognized by the U. S. Department of Education as an accrediting agency (ACCSCCT, 2006a). The ACCSCCT Standards of Accreditation (2007) explain that an institution may lose its accreditation if it does not maintain acceptable graduation rates (a measure of student retention). Marciszewski (2006) claimed that accreditation speaks to the quality of a school's programs and can affect a school's ability to recruit students. Tinto (2005) also asserted that today many states view graduation rates as a measure of quality when considering approving programs of study.

Several researchers have pointed out a relationship between student retention rates and institutions' financial well being. Summerskill (1962) explained that "dollars leave the income side of the budget when students leave the college" (p. 628). In 1993 Tinto warned that many small schools were facing financial difficulties because of student

attrition. Tinto (2005) added, “Forced to cope with tight, if not shrinking, budgets, institutions face mounting pressure to improve their rates of student retention and graduation. In many cases, this pressure reflects the movement of states to include graduation rates in a system of institutional accountability” (p. ix).

The Center for the Study of College Student Retention provides resources for research related to student retention. The Center reported:

Current U. S. retention figures have not improved over time, even with large amounts of money expended by colleges and universities on programs and services to retain students. In spite of these programs and services, retention figures have not improved. In fact, only about 66% of high school graduates attend college and about 50% of those who attend college earn a bachelor degree. (n.d., para. 5)

Colleges are searching for ways to retain students, according to the Center. The failure to solve the dropout problem could result in an institution failing, or at the very least, having to close programs.

Dropping out of college is a problem for students as well as for institutions.

“From the student’s point of view, the effect of dropping out, although difficult to gauge, is also another important aspect of the attrition problem” (Pantages & Creedon, 1978, p. 49). Summerskill (1962) stated, “We need to know more about what really motivates the successful college student, whether these motives be personal and essentially affective or academic and essentially rational” (p. 648).

Students seeking certain professional certifications must complete required programs of study (i.e. accountants, aircraft maintenance technicians, doctors, and lawyers). Persistence to program completion is clearly related to the ability of these students to attain their employment goals. Choy (2002) found that approximately one-third of the students earning bachelor’s degrees are enrolled in a graduate program within

four years. Dropping out will prevent some of these students from reaching their goals of professional careers.

Degree completion has been demonstrated to impact financial success of graduates. “With a flood of baby boomers retiring, an economy on the rebound from the post-Sept. 11 slump and a technology upturn after the 2000 dotcom bust, employers will hire nearly 15 percent more college graduates this year than a year ago. And many of this year’s hires will be paid more, too” (Williams, 2006, F15). The National Center for Educational Statistics has shown that college graduates in 2004 earned at least 60% more than high school graduates (2006, Table 1).

However, not every student entering college is searching for a career. Pantages and Creedon (1978) found studies that suggested, while men often tended to view a career as the goal of college, women were more likely to view college as an end to itself. Also, students enrolled in liberal arts colleges were often unsure about career goals, or were more interested in “academic” reasons. It is more difficult to determine the effect dropping out will have on these students. Summerskill (1962) claimed that dropping out may have been a positive solution for some academic problem, some psychological problem, or some social problem. However, Tinto (1993) asserted, “For individuals the occupational, monetary, *and other societal rewards of higher education* [italics added] are in large part conditional on earning a college degree” (p. 1).

Defining “College Dropout”

Kuh et al. (2005) agreed that persistence and educational attainment rates must improve. But they pointed out that not everyone agrees on how to compute graduation rates. Pantages and Creedon (1978) stated that “the most meaningful research on attrition

is provided by studies that...use precise operational definitions of dropout and nondropout” (p. 92). Summerskill (1962) reported that in the past “attrition rate” had been defined in various ways. Terms such as dropout, stopout, student mortality, withdrawal, transfer, and losses to the college appear throughout the literature.

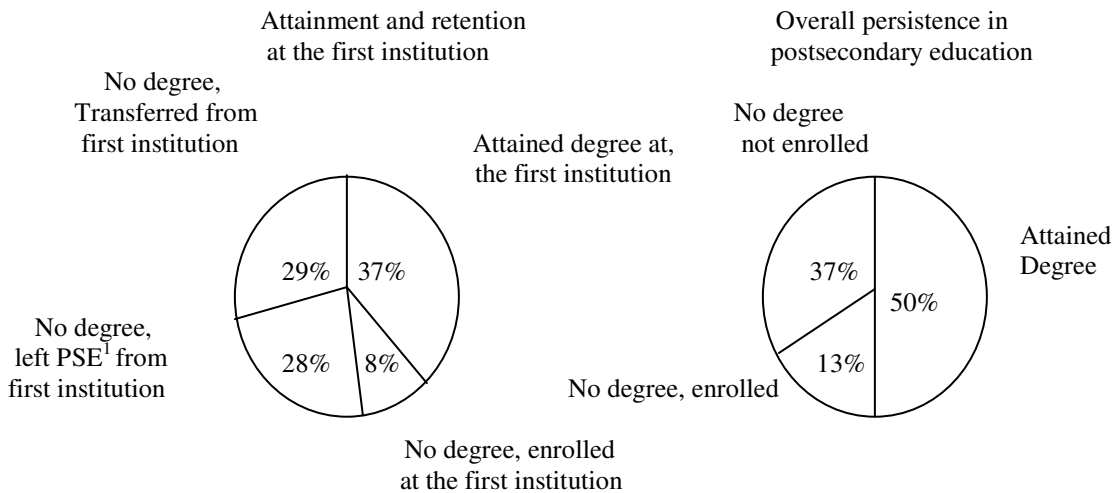
Tinto (1993) classified student departures as: 1) institutional departures, and 2) system departures. Institutional departures include students who left an institution and have transferred to another institution (transfers), and students who temporally left school and returned to higher education at a later date (stopouts). Tinto suggested that these actions tend to overstate the number of students who fail to persist in the higher education system. Choy (2002) argued that “One of the most important findings from the longitudinal studies is that institutional retention rates greatly understate postsecondary persistence” (p. 19).

Hagedorn (2005) pointed to some of the problems with the terminology used in retention literature. According to Hagedorn it would seem logical that persistence and dropout are pure opposites. However, her research found that “dropouts” may be stopouts, transfers, or may simply be students who have achieved their goals and leave higher education satisfied with their experiences. She pointed out that some researchers would classify students who completed an associate’s degree or certificate program as dropouts because they failed to obtain a bachelor’s degree, while others would classify this group as completers.

Also, Hagedorn (2005) found that persistence and retention, while often used interchangeably in the literature, are in fact not always an equal measure of student behavior. Students may leave their original institutions, but remain in higher education

and achieve their individual goals. Some students may dropout temporarily and then return to their original institutions, which is not addressed in this study. Hagedorn stated that retention is more an institutional measure, while persistence is more of a student trait. Astin (1971) maintained that, “A ‘perfect’ classification of dropouts versus nondropouts could be achieved only when all of the students had either died without ever finishing college or had finished college” (p. 15).

In a recent study reported by the National Center for Educational Statistics (2007), 50% of a sample of students entering postsecondary schools in 1989-1990 had obtained some degree after five years (either a two-year degree or a bachelor degree). Another 13% of these students were still enrolled after five years, eight percent in their original institution. Twenty-nine percent of these students left their first institution, enrolled in another, but still have not completed a degree (See Figure 2).



¹Postsecondary education

NOTE: Transfers only include those who transferred before attaining a first degree.

SOURCE: U. S. Department of Education, National Center for Educational Statistics (2007)

Figure 2 Intitutional retention and overall persistence rate of 1989-90 beginning postsecondary students after 5 years

The confounding effects of student transfers on reporting retention and completion rates have been illustrated in several studies. For example, Choy (2002) found that while 47 percent of a group of students entering college in 1989 earned a degree at their original institution in five years, 13 percent had transferred to other institutions and obtained degrees at the receiving schools. Because of the student transfer problem, Congress has considered legislation requiring colleges and universities to report degree completion rates for transfer students, both those who transfer from an institution, and those who transfer in (Kuh et al., 2005).

The National Center for Education Statistics (2007) emphasized that an important distinction to make when studying persistence is the type of degree offered at the institution in the study. The study also suggested that students who receive a certificate of completion for a technical program of study should be considered as completers. Still, the Center for the Study of College Student Retention (n.d.) reported that of the 1,850,000 students who attend college this year, only 925,000 will earn a bachelor's degree.

Retention Rates for College Students Are Not Improving

Kuh et al. (2005) cited several sources that indicated the college graduation rate has remained around 50 percent for several decades. Summerskill (1962) reviewed 35 different studies involving attrition reports from hundreds of colleges, dating back to 1913 and reported that, "Median values were computed for the aggregate of these studies with results as follows: median loss in four years—50%; median percent graduated in four years—37%" (p. 630).

Vincent Tinto (1993) also reported on the low completion rates of post-secondary education. He stated that:

More students leave their college or university prior to degree completion than stay. Of the nearly 2.4 million students who in 1993 entered higher education for the first time, over 1.5 million will leave their first institution without receiving a degree. Of those, approximately 1.1 million will leave higher education altogether, without ever completing either a two- or a four-year degree program. (p. 1)

Tinto's numbers differ little from the findings of Summerskill. Similarly, the Center for the Study of College Student Retention (n.d.) reported that of the 66% of high school graduates who attend college, only about 50% complete a bachelor's degree.

Tinto (1993) stated that a large number of intuitional departures take place during the first year of college. Tinto noted that American College Testing (ACT) had reported in 1992 that 26.8% of all full-time students entering four-year institutions failed to return after their first year. These American College Testing figures showed only a slight decline in attrition since 1983, when 27.1% first year students failed to return. Berger and Lyon (2005) found that retention rates nationwide are still lower than most school officials would like, citing a current ACT report that showed 25.9% of college freshmen in four-year institutions failed to return for a second year.

ACCSCCT (2006b), in its 2005 annual report, indicated that graduation rates among the schools accredited by the Commission actually declined from 2003 to 2005. The Commission also stated that there was a definite positive correlation between length of academic programs and student attrition. The Commission requires that a school graduate only 35% of students in programs of two years or longer to meet minimum graduation requirements for accreditation.

Schools, from major research universities to community colleges, continue to explore ways to retain more of their students. A web search in the area of student

retention found over 240,000 sites on the Internet that addressed this problem. Braxton (2000a) stated:

Through efforts to understand this “departure puzzle” we have much to learn about colleges and universities as organizations, the college experience of students, and the interpretations students make of these experiences. (p. 1)

Despite these efforts, Seidman (2005) asserted, “the retention data reveal that students are not retained at a higher rate than they were twenty years ago” (p. 295). The reasons for student departure are not fully understood.

In addressing student loss and retention, Stage and Hossler (2000) asked, “Where is the Student?” They asserted that future research into student retention should involve a student-centered model. Stage and Hossler suggested inclusion of many elements in a research study to determine if students will ultimately persist or depart. These included family background, school experiences, and intentions such as career goals. Examining these student traits might aid in answering research questions that address relationships between commitment to various goals and success in college.

High Attrition Rates in Technical Education

Many programs of technical education are two years in length and are taught at community colleges or technical schools. ACCSCT (2006b) lists 821 career or technical schools currently accredited by the Commission. Past studies suggest that future research into student retention should involve two-year institutions and their students (Braxton, 2000b; Pascarella & Terenzini, 2005). Choy (2002) found in one study that seven percent of the students listed as obtaining degrees had earned an associate degree or a certificate.

Studies that have examined attrition in two-year post-secondary institutions have

suggested that the rates are high. Resch and Hall (2003) reported in their study of technical colleges that attrition was over fifty percent. Tinto (1993) also found that attrition in two-year programs was greater than in four-year institutions, often occurring in the first year of training. Many times students who enrolled in these programs were labeled non-traditional because they had not come to college directly from secondary education. The National Center for Educational Statistics (2007) related this non-traditional characteristic to attrition and reported that delaying entry into postsecondary training after high school was a risk factor for persistence.

Another factor that can contribute to reported attrition rates in technical education is the learning goals of the students. Students in technical education are often adult learners who came to the training seeking new job skills or new careers, and older students have been found to be more likely to leave school without a degree (Knowles, 1977). These students' goals may not have been to graduate, but rather to gain some special knowledge that was a part of a program. Once these students have obtained what they are seeking, they leave school and are counted as dropouts, increasing the school's apparent attrition rate. This situation may be improved because students who complete a program for certification (such as Aviation Maintenance Technician) may be listed as a completer under new reporting standards.

The National Center for Educational Statistics (2007) found that non-traditional students had certain risk factors because they did not follow the traditional path through postsecondary education. These students may have financial needs, family demands, or other special needs. Many of these students must work full time and attend school only part time, which can give a sense of disassociation with fellow students and faculty. On

the other hand, Spangler (1994) explained that two-year schools are more likely to have flexible schedules that accommodate these working students.

Efforts are now underway to better understand what makes students in community colleges successful and avoid contributing to attrition rates. The Community College Survey of College Engagement (2007) has recently completed a study of student engagement and student outcomes in community colleges. The study lists student effort as one aspect of effective educational practice. Kuh et al. (2005) contended that, “What students *do* during college counts more for what they learn and whether they will persist in college than who they are or even where they go to college” (p. 8).

The relationship of student goals and expectations to their efforts and persistence has been addressed by several researchers. Wlodkowski (1985) claimed that students with well defined goals are more highly motivated and more eager to learn. Spangler (1994) indicated that this makes the student’s choice of a school very important. If the school is unable to provide the type of educational experience the student expects, the student is likely to leave school prematurely. Kuh et al. (2005) stated, “If faculty and administrators use principles of good practice to arrange the curriculum and other aspects of the college experience, students would ostensibly put fourth more effort” (p. 9).

Lack of institutional support can also contribute to student attrition. Moxley et al. (2001) found that some technical schools did not have supportive practices that applied to a number of different students. They stated, “*By support we mean the matching of resources to the needs of students so that they can master the role of student...*” (p. 216). This position appears to support Tinto’s theory of institutional departure. According to Tinto (1993), students leave a particular institution because the institution has failed to

integrate these students into the “community.”

High Attrition in Aviation Training

Little industry-wide data has been published on enrollment numbers and graduation rates in aviation technical schools. Hansen and Oster (1997) found that over half of the schools offering aviation training had programs of two years or less. Many of these schools are proprietary schools and have been hesitant to publish information that might be used by their competitors.

Statistics available from the Federal Aviation Administration (FAA) do, however, shed some light on the situation. The FAA estimated that 23,464 students enrolled in certificated Aviation Maintenance Technician programs in 1989 (U. S. Department of Transportation, Federal Aviation Administration, 1996). Based on the FAA required curriculum, these students should have completed their training in 1991. However, the FAA estimated that only 11,682 students graduated from these programs in 1991, which would be a completion rate of less than 50 percent.

Several researchers have studied issues of diversity in students’ entry and persistence in aviation careers. Clark (2006) explored reasons why students chose to attend a four-year university to become commercial pilots. Her research examined the relationships between gender and school choice, and between ethnic background and school choice. Clark’s research was limited to pilot training and did not consider other careers in aviation, such as aircraft maintenance technician. Her research also was limited to four-year schools.

Sloan (2006) studied ways to improve retention of Native Americans in a program of flight training. This study also was conducted in a four-year institution. Sloan

discussed the importance of external communities (families, tribal members, mentors, etc.) in student retention. While this study was limited to Native Americans, it does suggest that career awareness is an important factor in a retention program.

The cyclical nature of employment in the aviation industry may relate to the recorded attrition rate in its training programs. The Federal Aviation Administration (FAA, 1996) reported a drop of 50 percent in enrollment in Aviation Maintenance Technician Programs in the years 1994 and 1995. This resulted from an economic and employment downturn in the industry beginning in 1990. Many students dropped out of training because of the perception that their chances of finding employment in the industry were very poor. The industry was hit hard again by the events of September 11, 2001.

Because many aviation schools have only aviation courses (Spangler, 1994), changing a major may not be an alternative to dropping out for a student in these schools. A student may only be able to change from one aviation program to another. For example, a student may choose to change from flight training to maintenance, or may change from a degree program to a non-degree program. The only other alternative would be what Tinto called institutional departure; to seek a different career field. Hagedorn (2005) indicated that community colleges are more prone to monitor program completion as a measure of student persistence than institutional departure.

Due to the decline in demand for aviation training in the mid 1990s, many vocational schools have eliminated aviation training programs from their curriculum. By 1994 at least thirty schools had discontinued such programs (FAA, 1996). More schools have closed, or discontinued programs, since the attacks on the World Trade Center. The

remaining schools must make all possible efforts to retain the students they enroll. A successful retention program could prevent a school from closing.

Factors Affecting Attrition

Tinto (1993) listed two broad reasons for students leaving college: individual traits and institutional characteristics. According to Tinto, each institution must examine its mission when designing a retention program and each institution must be prepared to meet the needs of the individual student. According to Tinto, when institutional internal factors fail to meet students' needs to integrate into the institutional "communities," these students tend to depart. Moxley et al. (2001) concurred with this viewpoint and claimed that, "Retention requires a psychosocial perspective, and it must address the personal and social needs that all students experience in their quest to achieve success in the educational situation of their choosing" (p. 36). This raises the question of what these need might be and thus what factors might contribute to student attrition.

Braxton (2000b) extended Tinto's theory to add the integration effects of external communities and student characteristics on academic performance. He posited that influences on college student persistence and departure decisions were derived from four theoretical frameworks: economic, organizational, psychological, and sociological.

In order to persist in a training program, students need to achieve academic success, and one reason for attrition may be academic failure. Some institutions have open enrollment, and students may not be prepared for the academic demands of college. In 1983 The National Commission on Excellence in Education released the study *A Nation at Risk*. While the study primarily reported on the conditions in secondary schools, two findings pointed out problems for post-secondary education. "One-fifth of

all 4-year public colleges in the United States must accept every high school graduate within the state regardless of program followed or grades.” Also, “about 23% percent of our more selective colleges and universities reported that their general level of selectivity declined during the 1970s, and 29 percent reported reducing the number of specific high school courses required for admission” (Findings Regarding Expectations).

While some students simply do not work up to their potential, entrance tests do not always accurately predict student success. The National Center for Fair & Open Testing (2007) stated that standardized tests are not fair and are not helpful student evaluation tools. The Center further stated that test scores do not reflect real differences among people. As an example, Pavel (1992) found that Native American students with high SAT scores did not complete their degrees at the same rate as students from other ethnic groups with comparable scores.

Kuh et al. (2005) humorously suggested that the way to increase student success is to only admit well-prepared, academically talented students. Since this approach is unacceptable, institutions have implemented programs intended to reduce academic failure. Identifying “at risk” students, remedial courses, and tutoring and mentoring are some of the resources aimed to increase student success and retention. However, it has been estimated that academic failure accounts for only fifteen to twenty-five percent of all student attrition in most schools (Tinto, 1993).

With rising tuition costs and less financial aid, financial concerns might be a reason for some students to leave college. Pascarella and Terenzini (2005) asserted that:

financial aid can determine not only whether and where students go to college but also the kinds of experiences they have while there, how much they will

learn or change, the likelihood that they will persist and graduate, and ultimately, whether they will reap the full intellectual, personal, social, occupational, and economic benefits of college. (p.644)

Tinto, however, argued that there was little support for the theory that many students left school because of finances. He claimed that, “Financial considerations appear to be but one part of a much more complex decision-making process...” (1993, p. 83). This view was supported by Resch and Hall (2003) who found that providing more financial aid to students in Georgia technical colleges did not reduce attrition.

Students’ inability to adjust to life at an educational institution was the reason most students left college, according to Tinto (1993). Tinto wrote that students who could not become part of a group, or who felt the faculty and staff were not supportive, were at risk of not persisting when they encountered difficulties. Tinto classified these dropouts as “institutional dropouts.” In addition to internal factors in institutions, Moxley et al. (2001) claimed that external communities of support (families, friends, community services) could also help institutions reduce attrition by providing support systems for students.

Career Choices, Culture, Motivation, and Retention

“Most first-year college students...don’t know which careers they will pursue” (Katona, 1999, p. 1). This fact alone makes it important to understand why certain students make a commitment to one career field. Katona proposed that many high school students were motivated to choose careers they felt would be a benefit to society. For aviation, this might be more apparent in times of crisis, such as when the country was at war, or after the attacks of September 11, 2001.

Many students have difficulty making a career choice because they have had few

chances to be involved in a program of career awareness. Moxley et al. (2001) stressed the value of career awareness stating that, “The idea of career can help students to make sense of the choices, decisions, and transitions they face” (p. 87). Still, some students will make career choices simply by chance, and Moxley et al. asserted that an institutional retention plan should provide students access to professional and career development. They added that integrating work experience into the learning experience may help students to better see the benefits of persisting in their education.

Kamens (1971) studied the effects of college size on occupational choice and college attrition. Kamens postulated that when students believed a school could provide them with the training needed to reach their career goals, they were more likely to persist in their training. He also found no relationship between school size and student attrition when individual traits were held constant. Career choice, and the ability of the school to deliver the required training, were major factors in student persistence.

Tharenou (2001), writing in the *Journal of Occupational and Organizational Psychology*, discussed how many researchers have attempted to show that motivation and success in training are highly correlated. The choice of a career, and the student’s ability to pursue that career, might be highly motivating factors. Linnenbrink and Pintrich (2002) theorized that motivation was multifaceted, containing at least four separate components. One of the components affecting student academic success was intrinsic motivation. Motivation is a dynamic trait according to Linnenbrink and Pintrich, and students’ personal interests have the potential to influence motivation, and thereby influence academic achievement.

A blue ribbon panel was appointed by the Federal Aviation Administration to

look into the need for aviation professionals in the future. Their report, *Taking Flight: Education and Training for Aviation Careers* (Hansen & Oster, 1997) provided several insights into the problems the industry faced in attracting and training aviation professionals. This report listed some of the reasons a person might not choose aviation as a career. Included in these reasons were gender bias and the fact that there is only a small number of minorities in the aviation industry.

Shamai (1996) supported the contention of gender bias in the aviation industry, and also found that gender stereotypes were a factor in career choice. Male students were more likely to choose science-based careers because of their perceived roles in society. The number of women certificated by the FAA at the end of 1995 was less than ten percent of all active pilots and mechanics. Less than one percent of certificated mechanics were women (Hansen & Oster, 1997). Unfortunately many young women were discouraged from pursuing careers in mathematics and science by parents and teachers because they did not perceive these careers as typical female roles in our society.

Culture might also be a factor in a student's decision to persist, or fail to persist in aviation training. Macionis (1999) explained that culture includes what we think as well as how we act. According to Macionis, culture provides individuals with values. Macionis asserted that social controls encourage members of society to conform to norms. Aviation has many strict regulations. If the controls of the industry are inconsistent with a student's cultural values, he or she may decide not to persist or to pursue another career goal.

One cultural factor that can relate to career choice and persistence is ethnicity. Previously many African-Americans have had an interest in aviation careers, but the

industry was reluctant to provide them access to jobs other than the low paying, menial jobs. After several lawsuits, and changes in federal regulations, opportunities for African-Americans in aviation have become more wide spread (Hansen & Oster, 1997). If minority students experience such biases in school, they may decide to choose another career field and find another school.

As an example of the importance of racial culture factors in career and school choices, Laughlin (2001) explained that most Native American students attending college are first generation college students. Schargel (2004) listed mother's education as one risk factor for a student becoming a dropout. Because the parents of these students have no experience in the college selection process, Native American students may not know what options are available to them. Laughlin added that student counselors in schools with large Native American populations may be ill prepared to advise students about career and school selection.

Parental influence is another culture factor that can play a big role in determining how successful minority students are in technical training. For example, Asian students might be more motivated to persist by high family expectations, while Native Americans are less likely to complete degrees. McEvans and Astin (1992) reported Whites and Asians are more than twice as likely to complete a college degree as Native American students.

Covington (2000) suggested that more research was needed to determine how culture could be a motivating factor. Pavel (1992) believed past studies show the need for qualitative research to determine how sub-cultures, and the quality of career advisement, affect participation and graduation in college. Laughlin (2001) explained that student

counselors are often the only source first-generation college students have to assist them in making decisions.

In an effort to encourage young people to consider careers in aviation, organizations such as the Experimental Aircraft Association (EAA) have developed programs promoting aviation (Smith, 1999). These programs also stress another factor that can affect persistence in a career training program: the importance of preparing for these careers in high school. Students in these programs are shown how mathematics and sciences are applied in aviation training and practice. Smith explained that the EAA provided curriculum materials for aviation schools, and free flights and aviation activities for students. It is a tenant of these programs that high school students who make informed career choices should be better prepared for the rigors of training than the students who enter the programs by chance.

Much research has been conducted concerning the relationship between motivation and student academic achievement. Recently researchers have also begun to investigate the relationship between interests and academic success. There have been some studies of how interest in a field of study could motivate students to be more successful in college (Schiefele et al., 1992). However, there appears to be no specific study yet of aviation training that considers interest and other factors that motivated students to choose this training, and whether or not they were successful in their training.

Studies have shown student academic success to be positively correlated with student motivation. Covington (2000) recalled the remarks of Terrell Bell, former Secretary of Education, who stated, “There are three things to remember about education. The first is motivation. The second one is motivation. The third one is motivation” (as

cited in Maehr & Meyer, 1997, p. 372). Several types of motivation were defined by Linnenbrink and Pintrich (2002). However, understanding human motivation is not a simple task. Factors related to internal and external motivation are much easier to define than to quantify.

Schiefele, Krapp, and Winteler (1992) listed interests, such as preferences for a subject area, as one probable reason for academic success. Students in secondary schools often develop interests in computers and technology. Following these interests sometimes leads the students into careers filled with computers and high technology. Those students who then find their training interesting are more likely to be motivated to persist in this training. According to Spangler (1994) “students do best when studying something of interest” (p. C46).

How academic preparation and student success in higher education are related is another area that has been widely researched. Harackiewicz, Tanner, Barron, and Elliott (2002), in their study of achievement goals and ability, observed that schools have traditionally relied on standardized test scores and high school academic performance to predict college success. However, Tinto (1993) reported that academic failure was only a small part of the attrition problem.

College students often change their majors after they begin school (Katona, 1999). In certain technical training programs students might choose to drop out of school because that was the only way they had to change to another career field. Involving students in a retention program provides a channel of communication that helps the students to better understand that they are a part of the learning environment. A good retention program should include information about careers and work so that students

understand the relevance of their education in achieving their personal goals (Moxley et al., 2001).

One of the reasons for choosing a career in aviation might be a prior interest in the field. Perhaps a student had a family member, or a friend, who was in the aviation industry. Some students have been previously exposed to aviation by participating in such groups as Explorer Scouts, Civil Air Patrol, high school ROTC programs, or Project Lead the Way which is working to prepare students in the STEM (science, technology, engineering, and mathematics) areas. Economic considerations such as higher pay for aviation professionals sometimes attract individuals who might be making a career change (Hedden, 2002). Still the reasons for choosing a career in aviation have not yet been studied in relation to student academic success.

Summary

The reasons students persist, or fail to persist, in college are still not fully understood. Braxton (2000b) asserted that, “Multiple replications of studies conducted in different types of college and universities and with students who are members of various racial/ethnic groups are needed” (p. 268). The majority of studies in the area of student retention have been conducted in four-year colleges and universities rather than in the two-year institutions where much aviation training is situated. Little research has been done involving aviation training, and none of that research attempts to tie career choice to student retention.

For students to be successful in their training, they must persist. As Tinto (1993) stated, until the reasons for students departing are understood, it will be difficult to determine what helps students to persist in their training. This study addressed the

possibility of a relationship between career choice factors and persistence in aviation training. This study may provide a basis for further studies related to recruitment and student retention in aviation training.

CHAPTER III

METHODOLOGY

Introduction and Overview of the Study

The purpose of this study was to investigate the reasons why students chose careers in aviation, and to determine if there was a relationship between the reasons for career choice and student academic success in aviation training.

Specifically, this study was guided by the following research questions:

1. What are the reasons participating students had for choosing to pursue a career in aviation?
2. What are the academic success rates of the participants in this study?
3. Is there a relationship between the reasons for the students' aviation career choice and their academic success?

For this study, academic success was operationally defined as *persistence to program completion*.

While many potential factors have been studied, the reasons students persist, or fail to persist, in college are still not fully understood. The available literature revealed that the majority of the studies in the area of student retention have been conducted in four-year colleges and universities rather than in the two-year institutions where much of the aviation training is conducted. Little research has been done involving aviation training, and none that attempts to tie career choices to student retention, which was the focus of this study.

Research Approach and Design

This study was descriptive in nature. It *described* the reasons why students chose careers in aviation and determined their current status as completers or non-completers. Lauer (2006) stated that descriptive research is one of the basic types of educational research. “Descriptive research,” she wrote, “is used to answer questions: *What is happening? How is something happening? Why is something happening?*” (p. 13). Gay (1987, p.18) listed four reasons to classify the research method as descriptive research:

1. Descriptive research involves collecting data in order to test hypotheses or answer questions concerning the current status of the subject of the study.
2. Descriptive data are typically collected through a questionnaire survey, an interview, or observation.
3. Since one is generally asking questions that have not been asked before, instruments usually have to be developed for specific studies.
4. A major problem further complicating descriptive research is lack of response-failure of subjects to return questionnaires or attend scheduled meetings.

This study fits all of the above definitions of descriptive research.

A mixed-methods research design was suggested by the theoretical foundations of the study. Creswell (2003) explained

... a *mixed methods* approach is one in which the researcher tends to base knowledge claims on pragmatic grounds (e.g., consequence-oriented, problem-centered, and pluralistic). It employs strategies of inquiry that involve collecting data either simultaneously or sequentially to best understand research problems. The data collection also involves gathering both numeric information (e.g., on instruments) as well as text information (e.g., on interviews) so that the final database represents both quantitative and qualitative information. (p. 20)

This study used a mixed-methods design that combined quantitative data and qualitative data, and multiple collection and analysis techniques to answer its research questions as suggested by its theoretical framework.

Tinto (1993) stated that until the reasons for students departing are better understood, it will be difficult to determine what helps students to persist in their training. This study addressed the previously-unexplored possibility of a relationship between career choice factors and persistence in aviation training.

Braxton (2000b) acknowledged that Tinto's propositions on student retention have been one reason why more is now understood about the reasons for college student departure. According to Braxton, research testing Tinto's theory has yielded empirical support for four interconnected propositions. Stated in narrative form, these propositions are:

Students enter college with various characteristics that affect their initial levels of commitment to the institutions in which they are enrolled. Their initial levels of commitment also affect their levels of commitment (subsequent commitment) to their institutions that form as a consequence of attendance. Their levels of subsequent institutional commitment are also positively influenced by their degree of integration into the social communities of the college or university. Moreover, the greater their degree of subsequent institutional commitment, the greater the likelihood of student persistence in college. (pp. 257-258)

Braxton urged that Tinto's theory should be revised based on the four relationships described above.

Braxton (2000b) noted several instances where researchers, including Tinto, recognized that the interactionist theory failed to consider external communities (families, secondary schools, student groups, etc.), and to adequately account for the effects of individual psychological processes and economic forces. Braxton stated:

Given such shortcomings, the process of inductive theory revision urged here

should entail empirical investigations—qualitative and quantitative—that discern the influence of various constructs derived from economic, organizational, psychological, and sociological theoretical frameworks on college student departure decision in general and social integration in particular. (p. 259)

Stage and Hossler (2000) declared that “few studies have systematically examined the variables and experiences associated with enacting the educational plans of students” (p. 188). Yet, Stage and Hossler asserted that a student’s background is an important factor in determining how well the student will adjust to the college environment. They suggested future research should address family background and economic issues, and student ability and beliefs, because they frequently have a direct influence on student persistence.

Factors such as parental economic status and educational level are easily quantified and thus are appropriate for quantitative analysis. However, factors such as encouragement from parents, teachers, and friends; and personal characteristics such as beliefs, goals, and self-efficacy are much more difficult to assign numerical values and thus more appropriate for qualitative analysis. Using a mixed-method study allowed the researcher to explore more deeply the factors for career choice and the decision to persist, or to depart from aviation training.

To accommodate a mixed-methods design, this study was conducted in two phases. The first phase of the study was quantitative. It used a researcher-designed questionnaire and mail-out methodology. After the survey phase of the study was completed, telephone interviews were conducted with randomly selected participants as the second, qualitative phase. These interviews were used to probe more deeply into the answers given by the participants in the survey.

Population and Sample

Johnson (1980) defined a population as, “A collection, or set, of individuals, objects, or measurements whose properties are to be analyzed” (p. 20). The population for this study was all unsponsored students who were enrolled in programs leading to an associate degree in the aviation school chosen for the study in 1999 or 2000 (N = 1192). Because these students were required to complete their aviation program in no more than one and one-half times the program length (Code of Federal Regulations, 34CFR668.16), the participants could be clearly identified as either completers or dropouts at the time the study was conducted. Students who were sponsored by their employers, or another sponsor, were not included in the population because their decision to attend the training might not have been made by the student. Students from prior years would be difficult to contact because the school maintained no list of current addresses.

The researcher chose this population because as an instructor and an administrator at this school, he had a vested interest in reducing student attrition. The researcher also chose the school in this study because the school was willing to participate by providing names and address of former students. No academic data from the students’ records were provided to the researcher, and participants were informed and assured that their responses would be kept confidential. Pseudonyms were used to protect the identity of those students who participated in the interview portion of the study.

Shavelson (1996) explained the relationship between population and sample in this way:

We assume an indefinitely large—perhaps infinite—set of observations we would like to know about (e.g., achievement test scores for all third graders in the United States or reaction times for all college sophomores in a memory experiment). This *set of observations* is called a **population**. The population is so large that all

possible observations cannot be made, so a subset of all possible observations must be drawn. This subset of observations of a more limited number of people is called a **sample**. (p. 214)

In this study the researcher did not receive replies from all possible participants (the population), and the more limited number of people who replied became the sample. This was a self-selected convenience sample.

The sample for this study consisted of the 57 respondents who signed consent forms agreeing to participate in the survey. Of that group, 34 agreed to participate in the telephone interviews. Although this sample was small, based on school reports, it was believed to be fairly representative of the general population of the school on several demographic variables (see Table 2). Sample representativeness was established from the self-reported demographic data obtained in the survey. These data were compared to student demographics reported by the school in this study (Senior Vice-President for Education, personal communication, March 7, 2007) to aid in determining if the sample was representative of the population. The comparative data are shown in Table 2.

Table 2
Comparison of Demographic Data of Study Sample with Current School Demographics

	Sample(N =57)	*School (N = 1192)
Gender		
Male	86.4%	93.6%
Female	13.6%	6.4%
Average Age	23.2 Yrs.	23.4 Yrs.
Marital Status		
Single	65.5%	Not Available
Married	34.5%	Not Available
Out of High School Less Than 1 Yr.	42.4%	32.0%

*School data from personal communication, Senior Vice-President for Education, March 7, 2007

Instrumentation

Gay (1987) explained that in most descriptive research, instruments must be developed by the researcher. The researcher found no instrument that asked the questions that guided this research. A questionnaire (Appendix A) was developed therefore following guidelines from Thomas's (2004) guide, *Using Web and Paper Questionnaires for Data-Based Decision Making*. The questionnaire had an introductory paragraph explaining the purpose of the study, and assuring participants that all responses would be kept confidential.

The questionnaire was divided into five sections. The first section was to determine if the student had completed a program leading to an associate's degree. This section consisted of four "yes" or "no" questions and was linked to the theoretical framework showing persistence or departure. The first two questions asked if the student entered the college as an associate degree student, or if they added the degree later. The other two questions asked if they had graduated with an associate's degree, or if they had graduated without the associate degree (completed a diploma program). This allowed the researcher to compare the data from program completers separately from non-completers during the data analysis.

Section 2 utilized behavior checklists. Thomas (2004) asserted that "Behavior checklists are used to determine what experiences respondents have had, what activities they've participated in, or what activities they are interested in trying" (p. 34). The section began with a sentence with directions for answering the questions. Each of the five questions specified a behavior or activity concerning when or how the respondents had learned about careers in aviation. These questions were designed to determine what

social factors might have influenced the student to choose a career in aviation (family, friends, school, etc) such as those listed as external factors in the theoretical framework.

In Section 3 the students were asked to rank factors on three features that influenced their decisions to pursue a career in aviation. Question 1 provided information about how the student ranked economic value versus other factors, such as job satisfaction. Questions 2 and 3 explored who had influenced the students most in choosing both a career in aviation and their school. This section was to examine influences from personal environment and other external factors suggested by the theoretical framework.

Section 4 allowed for an open-response: In your own words please state why you made the decision to pursue a career in aviation. Thomas (2004) claimed that “Open-response questions are used when you want more in-depth information than a fixed-response item format question can provide” (p. 46). This section helped the researcher to determine if the students had definite career goals and how they had made these choices before entering the college. The data from these responses were coded and compared to the fixed-response replies to check for consistency of the answers in the survey. These data were also subsequently compared with the data obtained in the telephone interviews conducted later.

The last section provided for self-reported demographic data. This information was used to compare the sample characteristics with demographic data provided by the school to help determine that the sample was fairly representative of the population.

According to Thomas (2004), content validity focuses on the degree to which the questions in the instrument are linked to the objectives of the study. The questions on this

study's survey were linked to its objectives through matching theoretical reasons suggested by Tinto (1993) and Braxton (2000b) for student persistence or attrition. This provided content validity for the survey content.

To check for workability, the questions were administered in a pilot test in conjunction with the aviation school's admission test. A group of 15 students were chosen at random to answer the questions in sections two and three of the questionnaire. To ensure that all questions were understood by students and avoid loss of content validity from misunderstanding, the test administrator instructed the students to ask questions if they did not understand the questions and the available responses. Changes to some questions were made based on student feedback to assure more clarity. For example, some questions were changed so that the responses available for each question were not overlapping. Some other possible factors for career choice were suggested by the students when they did not find them listed on the questionnaire.

The revised questions were administered to a second group of 15 students who were randomly selected from the incoming class. Feedback from the test administrator indicated there were fewer questions from the students as they completed the questionnaire. As Gay (1987) explained, "Besides time constraints, a major reason more large-scale studies are not conducted is lack of available subjects" (p. 90). Because graduates of the school were not available locally, only a part of the questionnaire was used in the pilot test, utilizing sitting students. Gay stated that even small-scale pilot tests can be helpful and should be considered worthwhile.

Test-retest reliability was not established for the questionnaire. This study was conceptualized as a "snapshot" that captured an image of a specific group at a given point

in time. The questions were not suitable for internal consistency reliability calculations such as Cronbach's Alpha because they were not intended to assess a shared body of content.

Procedures

After obtaining approval from the Oklahoma State University Institutional Review Board (IRB), the researcher obtained from the aviation school that was the subject of this study lists of students enrolled in associate degree programs in 1999 and 2000. The total number of independent students (i.e., not sponsored by their employer or other source) was 1192. In an effort to update the mailing addresses of these former students, the researcher searched the Federal Aviation Administration's (FAA) website listing Airmen Certification. Since only pilots and technicians who were licensed by the FAA are listed on this website (which indicates the person completed some type of training), less than one-half of the 1192 students were listed. Many of those listed had not updated their address with the FAA since they were in school.

A packet was sent to each of the 524 students who enrolled in associate degree programs in 1999. Each packet contained a letter (Appendix B) explaining the study. The packet also contained the survey questionnaire (Appendix A). An informed consent form (Appendix C) asking each student to sign and return the consent form if they wished to participate in the study was attached to each questionnaire. Those students who wished to participate in the telephone interview portion of the study were asked to also give their consent for that interview, and to provide a current telephone number. A stamped envelope using the researcher's home address was provided in each packet for returning the consent form and questionnaire. None of the information obtained from the students

was shared with the school.

Only nineteen signed consent forms were returned from the mailing to those students who enrolled in 1999. The researcher determined that this sample was too small, and a second mailing was made to the students who enrolled in associate degree programs in 2000. The first mailing was made using school stationary and printed address labels. The second mailing used hand-written envelopes with no writing to identify the school. The second mailing brought the number of packets mailed to the total target population of 1192 students. Despite efforts to update the aviation school's records of the former students' mailing addresses, a total of 318 of the packets from the two mailings were returned as undeliverable. This reduced the available population to 874.

A total of 57 of the former students returned the survey questionnaire with a signed consent form, making a return rate of 6.5% of the available population. While this return rate is low and the obtained sample is small, comparison of this sample with the population on key demographic variables suggested that this was a reasonably representative sample (see Table 2, p. 48). Of the 57 subjects who agreed to participate in the study, 34 (60% of the sample; 4% of the available population) agreed to participate in follow-up interviews if selected.

After the sample was established, this study was conducted in two phases. The first phase was quantitative in nature and focused on the research questionnaire. The second phase was qualitative in nature and used the open-ended response item on the questionnaire and follow-up telephone interviews as the data sources.

Quantitative Phase

As Gay (1987) indicated, in descriptive research it is often necessary for the

researcher to develop the survey questionnaire. The questionnaire used for this study was developed by the researcher. The questionnaire (Appendix A) contained five sections (see p. 47). The questionnaire was accompanied by a letter explaining the purpose of the study (Appendix B) and an informed consent form (Appendix C). Packets containing these three elements were mailed to all of the students who were enrolled in programs leading to an associate's degree at the chosen aviation school in 1999 (N = 524).

Surveys that were returned with a signed consent form were coded to protect the identity of the respondent. The signed consent forms were separated from the surveys and placed in a locked cabinet in the researcher's home. The survey forms were separated into program completers and non-completers for data analysis.

The packets were mailed in groups of twenty-five, two groups a week. After the last group was mailed, approximately one month was allowed for any returns. At that point only 19 surveys had been returned with signed consent forms, and a list of former students who had enrolled in associate degree programs in 2000 was obtained from the selected school. Another 668 packets were assembled and mailed to these former students. From this mailing another 38 surveys with signed consent forms were returned.

After the second mailing the signed consent forms were examined and prepared for the qualitative portion of the study. This portion of the study continued until IRB approval to contact individuals expired. No further surveys were received during this period. This led the researcher to believe that further follow-up with subjects would not increase the number of returned questionnaires, and that it was time to proceed to data analysis based on the obtained small sample.

The quantitative portion of this study utilized descriptive statistics to provide a

representation of the data from the questionnaire. Shavelson (1996) emphasized that after collection of the data it must be summarized, stating “This is where statistics come in. Statistics provide quantitative methods for summarizing and describing data” (p.7).

Trochim (2006) explained,

Descriptive statistics are used to describe the basic features of the data in a study. They provide simple summaries about the sample and the measures. Together with simple graphics analysis, they form the basis of virtually every quantitative analysis of data. (Descriptive Statistics, para. 1)

Descriptive statistics used to analyze the data in this study included such measures as frequencies, the mean, and the standard deviation.

Shavelson (1996) listed several examples of data that can be described using descriptive statistics. Such data included scores, ratings, and group membership. This study examined several reasons why students chose to pursue training in the field of aviation, and then for each response, descriptive statistics were used to compare students who persisted in their training with students who did not persist.

Because of the small sample size, calculations such as frequencies and means were done by hand. When the standard deviation was calculated, the data were entered into SPSS. In Section 3 of the survey, respondents were asked to rank factors that influenced their decisions to choose a career in aviation. They were instructed to use “1” as the greatest influence and “5” as the least. These rankings were converted to rank points where a ranking of 1 was assigned a point value of 5, ranking 2 assigned a value of 4, and etc. Then the sum of the ranking points ($\sum \text{RankPoint}$) was determined for each item.

Qualitative Phase

Rubin and Rubin (1995) asserted that qualitative interviewing brings new

information and is a way to find out what others feel and think. To add depth to the study, the researcher chose to add a qualitative component to this study.

The qualitative data in this study were obtained from two sources; (a) an open-ended response item on the written survey and (b) follow-up telephone interviews with a small number of volunteer participants.

Data from the open-ended response were coded looking for emerging themes. “Coding is nothing more than assigning some sort of shorthand designation to various aspects of your data so that you can easily retrieve specific pieces of the data” (Merriam, 1998, p. 164). This procedure was undertaken to see if the themes might be factors that were listed in the fixed-response questions, or if themes existed that were not covered in these questions.

Once the themes were identified, the responses were quantified and compared to the results from Section 2 in the survey. This procedure allowed the researcher to check for consistency in the responses between the quantitative and qualitative portions of the survey.

The second source of qualitative data for this study was a set of telephone interviews as case studies. The school in this study enrolls students from almost every state in the United States. The former students who were participants in this study were no longer in the local area, and were widely spread geographically, so methods such as field studies, participant observation, and psychological testing were not practical. Therefore, telephone interviews were chosen as the most feasible method of gathering the qualitative data. Telephone interviewing may have limited the data because the researcher was unable to observe such things as the respondents’ body language and other visible

clues. In support of interviews in qualitative research, Seidman (2006) asserted that if a researcher's purpose is to understand how people make meaning of their experiences, then interviewing "provides a necessary, if not always completely sufficient, avenue of inquiry" (p. 11).

Before telephone interviews were conducted, the returned surveys with consent to participate in the telephone interviews were purposefully divided into two categories; program completers and non-completers. Surveys in each category were then randomly selected and the selected participants were telephoned. They were again asked if they wished to participate in a telephone interview. If one of those selected declined to participate when telephoned, then another participant was randomly selected.

Several times the telephone numbers called were no longer in service, or not the selected participant. These calls resulted in having to again randomly select replacements for the interviews. After exhausting all of the surveys from non-completers, only three telephone interviews had been conducted with non-completers. To obtain an equal number of interviews from completers, three of the interview with completers were randomly selected to be used in the qualitative data analysis.

Tape recording was not used during the telephone interviews. Researchers disagree on tape-recording interviews in qualitative research (Seidman, 2006), and Rubin and Rubin (1995) also noted that the use of recoding devices depends on the situation. To encourage students to participate in the interviews, the researcher in this study informed the students that the interviews would not be tape recorded. The researcher used written notes as a method of data collection. This was manageable due to the small number of interviews conducted and the relatively short duration (approximately 30 minutes) of the

interviews.

Because this study was a mixed-method study, the interviews were not as in-depth as in a purely qualitative study. The interviewees were first asked to tell something about themselves and their families to encourage them to talk. Then, they were asked about their choice of aviation training, and finally, they were encouraged to talk about their experiences in the school. The interviews averaged about thirty minutes each.

The interviews served three purposes. First, comparing answers given in the interviews to the written responses in the survey helped to judge the reliability of the data. Shavelson (1996) described reliability as “the consistency or dependability of a behavioral measurement” (p. 473). The second purpose was to help the researcher to more fully understand the reasons given in the surveys for the students choosing aviation as a career. Thirdly, the replies to questions regarding problems in school provided some insight into why students chose to either persist in their training or to drop out.

Data Analysis

The purpose of the data analysis was to organize the data so that comparisons could be made between those students who had completed their aviation programs of study and those who had not, and to look for relationships between reasons for choosing aviation careers and successful training program completion. Yin (2003) explained that the strategy to follow in data analysis is to rely on the theoretical perspective for your study. Stake (1995) remarked that analysis and interpretation are attempts to make sense of the data. In this study, data analysis was organized to facilitate sensible interpretation within the theoretical framework which underpinned the study.

Data were collected using mailed surveys and conducting telephone interviews.

Using quantitative statistical procedures, the data from the surveys were first analyzed. The data from the interviews were then studied and examined qualitatively for any added details about why the interviewees had chosen aviation training. Yin (2003) cautioned, “No matter what specific analytic strategy or techniques have been chosen, you must do everything to make sure that your analysis is of the highest quality” (p. 137). The researcher attempted to maintain quality standards throughout both quantitative and qualitative analysis in this study.

Quantitative Portion

Section 2 of the quantitative phase of the study asked the respondents to indicate when and how they became interested in a career in aviation. The responses for each item were totaled and computed as frequencies. These factors were then divided into responses from the program completers and non-completers and placed in a table.

In Section 3 the study participants were asked to rank factors that influenced their decisions to choose a career in aviation. A rank of “1” was the most influence, and a rank of “5” was the least influence. These responses were totaled and the mean and standard deviation computed for each question. The standard deviation provided an indication of which factors were more consistent between respondents. A lower standard deviation indicated that there was a greater consensus among the respondents about the importance of each factor.

The ranking were then converted into rank points and the sum of the ranking points for each factor ($\sum \text{RankPoint}$) was computed. Each ranking of 1 was assigned a rank point of 5, a ranking of 2 was assigned a rank point of 4, a ranking of 3 assigned a rank point of 3, a ranking of 4 a rank point of 2, and a ranking of one was assigned a rank

point of 5. Then the sum of the rank points (\sum RankPoint) was calculated. The factors for the questions in Section 3 were then rank-ordered according their \sum RankPoint and placed in tables. The factors with the highest \sum RankPoint were determined to be the most important to the participants.

Qualitative Portion

In the survey, the participants were asked to explain in their own words in an open-response item why they chose to pursue a career in aviation. In the telephone interviews they were asked the same question. This provided some test of reliability, determining if the response from each participant were consistent. The participants were then asked to explain problems they had encountered in school, and how they dealt with them.

It was necessary to impose order on the qualitative data to determine what information it contained. Seidman (2006), speaking about qualitative research, stated that before a researcher may work with interview data, it must first be organized. For qualitative research, the researcher may code the data looking for themes and patterns.

The first step in the data analysis was to separate the responses into those from program completers and those from non-completers. Then the data were reviewed and divided into smaller categories. The data were reread looking for concepts and themes that occurred in one group or the other, and if they were common to both groups. Rubin and Rubin (1995) wrote, "Themes are statements that explain why something happened or what something means and are built up from the concepts. Concepts reflect the underlying ideas with which people label their descriptions and understandings of their world" (p. 57).

The next step in the data analysis was to compare the emerging themes with Braxton's four factors (2000b) for career choice, and how each related to the student's integration into the school. This process directly related the data to the study's theoretical framework as recommended by Yin (2003). Each interviewee had been encouraged to tell the story of their experience before, during, and after their aviation training. Rubin and Rubin (1995) suggested it can be useful to find and analyze stories when looking for underlying meaning and themes. Again, the responses of the completers group were compared to those from the non-completers.

Summary

The purpose of this study was to determine if there is a relationship between career choice factors and academic success of students at an aviation school. This chapter described the research methodologies used. The design of the study was discussed, including the rationale for the use of a mixed-method study. The population and sample and the study's instrumentation were described, and methods of data collection and analysis were discussed. The findings on the data analysis are presented in Chapter IV.

CHAPTER IV

PRESENTATION OF FINDINGS

Introduction

The purpose of this study was to investigate the reasons why students chose careers in aviation, and to determine if there was a relationship between the reasons for career choice and student academic success in aviation training. Braxton (2000b) posited that influences on college student persistence and departure decisions were derived from four theoretical frameworks: economic, organizational, psychological, and sociological. The survey questionnaire for this study asked students who had successfully completed their course of study at the selected aviation school, and students who were non-completers, to identify factors that contributed to their choice of aviation as a career.

This chapter reports the analysis of the data collected from the sample of 57 students who agreed to participate in the study. All of these students were enrolled in 1999 and 2000 in a program that led to an Associate of Applied Science degree. These included both programs in flight training and in aviation maintenance. Academic success in this study was defined as persistence to program completion. The respondents were divided into completers and non-completers.

The first part of this chapter presents descriptive demographic information about the sample obtained in the survey and in follow-up interviews. This demographic information relates to the students' backgrounds before entering the college, and their status in the college. The second section of this chapter presents data provided by the respondents about their knowledge of aviation careers prior to coming to the college. The third section contains results from questions asking the respondents to rank order factors

that affected their decision to choose a career in aviation, and why they chose the particular college selected for this study. The fourth section presents relevant data from the open-ended responses in the survey, and data from follow-up telephone interviews.

Descriptive statistics were used in analyzing the quantitative data in this study. Trochim (2006) explained that descriptive statistics include such measures as frequencies, means, and standard deviations. Responses to the open-ended question on the survey, and the telephone interview results were analyzed qualitatively by coding and grouping of responses.

Demographic Data

Of the 57 former students who agreed to participate in the study, 30 (53%) had been students in a program leading to an associate's degree in aviation. This program is designed for students seeking to become professional pilots, not simply for those wanting a private pilot's license. Of the 1192 students who enrolled in the selected aviation college in 1999 and 2000, 434 (36.4%) were enrolled in associate degree programs in aviation (flight). Currently the college has a population that includes 38% in flight programs and 62% in aviation maintenance.

The former students were asked "Did you complete an associate degree at the college?" Thirty-eight students (67%) answered "Yes" to this question. In contrast, of the 1192 students who enrolled in 1999 and 2000 in programs leading to an associate's degree, only 293 (25%) graduated from the school with a degree. No associate degree program at the school reported a completion rate higher than 50% in the latest report submitted to ACCSCT (personal communication, Senior Vice President for Education, October 8, 2007). Thus the participants in this study had a higher completion rate than

what has been reported by the aviation school.

The participants in the survey were asked to provide information about their level of schooling or training before they entered the college. A high school diploma or GED equivalency is required to enter the college. The respondents reported the following:

- Some college, n = 12 (21%), including one bachelor’s degree
- High school graduate, n = 42 (74%)
- GED, n = 3 (5%).

In addition to secondary school and college, 16 of the 57 respondents (28%) had served in one branch of the U.S. military before entering the college, receiving some type of training. Table 3 compares how completers and non-completers were divided on the previous education variable.

Table 3

<i>Prior Training of Respondents by Completers and Non-Completers (N = 57)</i>			
	Some College	High School	GED
<i>Completion Category</i>	<i>(n/% of sample)</i>	<i>(n/% of sample)</i>	<i>(n/% of sample)</i>
Completers	9 (15.8%)	28 (49.1%)	1 (1.8%)
Non-completers	3 (5.3%)	14 (24.6%)	2 (3.5%)

Experience Prior to Aviation Training

One section of the survey instrument was designed to find what kind of experiences related to aviation careers the respondents had before entering college. These data were examined to determine if career planning might be related to persistence in college, and what influences parents and friends might have had on the students’ decisions to choose aviation as a career. This analysis was related to the study’s theoretical framework because one of the factors Braxton (2000b) listed as a reason students choose to either persist or to drop out of college is sociological influences.

In Section 2 of the survey, participants were asked the following questions:

- When did you first become interested in a career in aviation?
- How did you first learn about aviation careers?
- Which of the following aviation jobs was most attractive for you?
- What types of aviation activities were you involved in before entering the college?
- Who did you know that worked in the aviation industry, civilian or military, before you started your aviation career?

The first question was designed to address how much career planning the students might have had before making the decision to choose a career in aviation. Only 10 respondents (17%) indicated they first became interested in an aviation career after high school. The most frequent choice was “Before the 9th grade” with 34 respondents (60%) reporting that they were interested in aviation that early. Another 13 (23%) indicated that they became interested in aviation as a career when they were in high school (9th grade through 12th grade). Thus, it appears that the strong majority (83%) of this sample of students developed an interest in an aviation career prior to completion of high school.

Table 4 displays how these responses were divided between program completers and non-completers. These data suggest that both completers and non-completers tended to develop interest in aviation careers prior to high school completion, but that completers (86.9%) were somewhat more likely than non-completers (73.7%) to do this, and to develop this interest earlier, before the ninth grade. By contrast, non-completers (26.3%) were somewhat more likely than completers (13.1%) to develop aviation career interest after completion of high school.

Table 4

When Students First Became Interested in a Career in Aviation (N = 57)

Categories	Completers (N = 38)		Non-completers (N = 19)	
	n	%	n	%
Before the 9th grade	25	65.8%	9	47.4%
9th to 12th grade	8	21.1%	5	26.3%
After the 12th grade	5	13.1%	5	26.3%

Question 2 in the second section of the survey asked the respondents how they had first learned about careers in aviation. One-half (50%) of the responses indicated that the students had learned about aviation from family or friends. Media (movies, television, books, etc.) was listed by 27% of the students as the way they had learned about aviation careers. While 23% had previously reported they had become interested in aviation during the time they were in high school, in response to this question only 10% (n = 6) indicated that it was in school that they learned about aviation. Eight students (13%) listed advertising by aviation schools as the way they had become aware of careers in aviation. These data suggest that other sources of interest were important influences in these students' career interest. This was supported by the students' responses shown in Table 5.

Table 5 shows how the responses to the question "How did you first learn about aviation careers?" were divided between program completers and non-completers. The total number of responses to this question (n = 62) is greater than the number of completed surveys received (N = 57). This is because some respondents listed more than one factor that made them aware of aviation as a career. This question supported the concept that factors outside of school influenced career awareness and interest and provided some insight into what social factors might have influenced these students to start to think of aviation as a career choice. These data showed clearly that family,

friends, and media were the strongest influences in these students' career interest for both program completers and non-completers.

Table 5
*How Students First Learned About Aviation Careers (N = 57)**

Categories	Completers (42 responses*)		Non-completers (20 responses*)	
	f	%	f	%
In School	3	7%	3	15%
From Family or Friends	23	55%	8	40%
Media	10	24%	7	35%
Advertising by Aviation Schools	6	14%	2	10%

*Some students listed more than one category

The type of aviation jobs that were most attractive to the students was the focus of the next question in Section 2. The large majority of the respondents (66%) listed *pilot* as the job that was most attractive to them. The only other job that received noteworthy response was *aircraft mechanic* (32%). The responses for both program completers and non-completers were very similar. Those who were completers chose pilot 70% of the time, while 60% of non-completers listed pilot as the most attractive job. Demographic data had previously shown that 53% of those who participated in this study were students who were seeking a degree as a professional pilot.

The respondents were next asked to indicate which of a specified set of aviation activities they had been involved in before entering the college. These responses are shown in Table 6. Since they were instructed to check all of the activities that applied, the total number of responses (n = 72) is greater than the number of participants. The percentage of those who indicated that they had flown with friends and family was equal to those who responded that they had no aviation experience before college (29%). The greatest disparity between program completers and non-completers was in those who had military aviation experience (6% compared to 25%; see Table 6).

Table 6
*Aviation Activities Students Were Involved in Before College (N = 57)**

Categories	Completers (48 responses*)		Non-completers (24 responses*)	
	f	%	f	%
Explorer Scouts	3	6%	0	0%
High School or College ROTC	3	6%	1	4%
Civil Air Patrol	1	2%	2	8%
Military	3	6%	6	25%
Flying with Friends or Family	16	33%	5	21%
Training at Another School or Facility	9	19%	2	8%
None	13	27%	8	33%

*Some students listed more than one activity category

Non-completers were more likely to have had military experience, but program completers were more likely to have had a prior experience at another training facility than the non-completers (19% compared to 8%), and prior flying experience with friends or family (33% compared to 21%).

The final question in Section 2 asked, “Who do you know that worked in the aviation industry, civilian or military, before you started your aviation career?” Again, the instructions stated to check all choices that applied, and this resulted in 75 responses from the 57 respondents.

Approximately one-half of the responses for both completers (50%) and non-completers (52%) indicated the student knew either a friend or family member who worked in the aviation industry. The largest single response was that approximately one-third of both completers (30%) and non-completers (36%) stated they knew no one who worked in the industry before entering college. Table 7 shows the differences between responses from program completers and non-completers.

Table 7

*Persons in Aviation Students Knew Before College (N = 57)**

Categories	Completers (50 responses*)		Non-completers (25 responses*)	
	f	%	f	%
Family member	13	26%	6	24%
Friend	12	24%	7	28%
Teacher	3	6%	2	8%
Neighbor or acquaintance	7	14%	1	4%
No one	15	30%	9	36%

*Some students listed more than one category

Factors Affecting Students' Decisions to Choose a Career in Aviation

The questions in Section 3 of the questionnaire were designed to explore what perceptions and other factors affected the decisions of the students when choosing a career in aviation and to determine whether the most observed factors were in keeping with the theoretical framework of the study. Comparisons were made between program completers and non-completers.

This was accomplished using the ranking, rank ordering, and Σ RankPoint procedures described in Chapter III. A rank of "1" indicated the most influence and the greatest influence was shown by the lowest mean (M) in Table 8 and Table 9. The factor with the highest Σ RankPoints was determined to be the most significant factor for all of the participants.

Table 8

Factors That Had the Greatest Influence on Students Choosing Aviation Careers

Categories	Completers		Non-completers		Total	
	M	SD	M	SD	Σ Rank Points	Rank
Aviation is exciting	1.388	0.924	1.706	0.985	244	1
Aviation pays well	2.611	0.964	2.579	1.387	187	2
Friend or family in aviation	3.914	1.336	3.706	1.356	117	4
Great demand for workers	3.086	1.147	3.177	1.015	150	3
Aviation is high-tech	4.057	0.873	3.412	1.176	112	5

The perception that aviation provides an exciting career was ranked by the students as the number one reason for choosing that career. Both completers and non-

completers were closely clustered around the mean for this factor. The second most favorable perception was related to pay. The means for both completers and non-completers were very close for this factor. However, non-completers were more diverse in this area as indicated by the larger standard deviation (SD). Both of these top-ranked perceptions related to personal and social gratifications of aviation careers rather than to the expectations and influences of friends and family or to employment prospects.

Table 9
Persons Who Had the Greatest Influence on Students Choosing Aviation Careers

Categories	Completers		Non-completers		Total	
	M	SD	M	SD	∑Rank Points	Rank
Family member	1.161	0.583	1.692	1.109	256	1
Friend	2.148	0.864	3.182	1.401	135	2
Teacher	3.652	0.982	4.182	1.079	74	4
School counselor	4.217	0.998	4.083	1.564	64	5
Aviation school representative	3.458	1.318	3.071	1.685	122	3

A family member, or a friend in the aviation industry, were leading personal influences for students choosing a career in the industry. The poor response for teachers and school counselors may indicate a need for more career awareness and guidance in the public schools. One respondent wrote the comment “Little knowledge about the subject” when asked to rate their teacher and school counselor.

When asked why they chose the aviation school they attended (Question 3), 51% of the students replied that it was because of the reputation of the school. The second largest response was that the students were convinced to attend by the school’s marketing personnel (22%). Of the 12 who were convinced by marketing, seven were non-completers, which may suggest some worthwhile direction for further research.

Qualitative Data

The qualitative data consisted of two parts: a written question and a set of

interviews. The research questionnaire contained one section that allowed for an open-ended response. The students were asked to respond to the statement: “In your own words, please state why you made the decision to pursue a career in aviation.” The second part of the study involved telephone interviews with three program completers and three non-completers. These data were analyzed using content analysis and thematic coding.

Open-Ended Questionnaire Response

Three prominent themes emerged from the written open-ended responses:

- Aviation is fun and exciting (26%)
- The need for a career (28%)
- Flying has been a life-long dream (33%).

These data appear to confirm the quantitative indication that 60% of the participants were aware of aviation careers before the 9th grade (Table 4) and that 66% of them found pilot to be the most interesting career in aviation (see p. 65). They also supported the finding that in choosing the factor that most influenced their career decision, “A career in aviation is exciting” was the highest ranked factor (Table 8).

Some of the comments from the non-completers provided some insight into why the student did not graduate. One stated, “Had a background in aviation from the military service so I added to my training and attained my FAA license.” This student only wanted the FAA license and did not complete a degree.

Another non-completer stated that, “My parents wanted me to have a ‘real career’ and talked me into it as I was making no money at the time doing film and acting work.” This student entered flight training to satisfy his parents. He did not finish his training.

A non-completing student who was convinced to enter aviation training by the school’s marketing department wrote, “I never thought I would be able to go to college since I had poor grades in high school...So I took the chance. I am grateful for the experience.” This student dropped out of school and returned home.

Telephone Interviews

Six students were randomly chosen for follow-up telephone interviews after the survey was completed. The consent forms that indicated the student agreed to be interviewed were divided into completers and non-completers. Names were randomly drawn from each group until three successful telephone calls in each group were completed.

Table 10
Participants in Telephone Interviews

Pseudonym	Gender	Ethnicity	Age at the Time Started School	Prior Schooling	Number of Parents with Degree
<u>Completers</u>					
Jesus Avila	M	H	18-20	HS	0
Suzie Bailey	F	W	21-25	SC	1
Jack Daniels	M	W	18-20	SC	2
<u>Non-Completers</u>					
Chris Connor	M	W	18-20	HS	0
Peter Edwards	M	W	25-30	SC	0
James Davis	M	W	Over 30	BS	0

Program Completers

Jesus had no prior exposure to aviation and he wanted to attend an automotive school. His cousin enrolled at the aviation school in this study and Jesus drove him to the school. After seeing the college and the equipment, Jesus decided to enroll also. Neither of Jesus’ parents had any college, but Jesus decided to complete an associate’s degree; after that he completed a Bachelor of Science in Aviation Technology Management at the college. He is not working in aviation, but because of his bachelor’s degree, he has a job

in a manufacturing environment.

Suzie's father had been in aviation and felt it was no field for a young girl. Suzie has been interested in airplanes all of her life but spent two years studying biology. After her father died she met an avionics technician associated with the aviation college. She enrolled for a degree in aviation electronics. While in school Suzie worked part-time for a local airline. She learned that she needed an FAA license to work on the airplanes so she enrolled in another degree program. After earning an associate's degree and certification in avionics and mechanics, she stated, "I enjoy spending time working on aircraft and I am proud to be a mechanic!"

Jack knew he was going to college; both of his parents are teachers. Jack remembered the stories his grandfather told about working on airplanes and flying in World War II. Jack wanted to do "something different" so he chose aviation. He enrolled in a program leading to an associate's degree in aviation electronics. After completing this program, Jack continued into a bachelor's degree program and graduated with honors. He is employed in aviation and plans to complete a master's degree with his company's tuition reimbursement program.

The three completers who participated in the telephone interviews all seemed to have definite career goals in mind when they chose to enroll in this school. Two of the three students had parents who had college degrees and these two had attended other schools before entering the aviation school. All three students enrolled in technical programs. While they may have believed aviation is fun and exciting, it appears they were more concerned about the need to prepare for a career. All three are currently working, using some form of the training they received at this school.

Non-Completers

Chris wanted to be an automotive mechanic, but a representative of the aviation school convinced Chris to try aviation mechanics. Chris felt out of place at the school; no one really explained to him what kind of career he was working toward. Neither of his parents had been to college and could not advise him. Chris failed the mathematics course that was required before he could get to the mechanics courses. He left the school and now works part-time as a cook.

Peter had completed a program in aviation electronics and was working in Puerto Rico. He was married and had two children, so Peter began to investigate other schools to find a better job. He came to the aviation school with seven friends who enrolled in the Aviation Maintenance Associate Degree Program. After finishing the technical portion of his training, Peter was approached by a local airline. If Peter would get his FAA licenses, the airline would hire him. Peter had been away from his wife and family for 18 months. So, Peter dropped the degree portion of his schooling and went to work. The airline later went bankrupt and Peter returned to Puerto Rico where he now works as a mechanic.

James grew up around the airport near the aviation school. As a child he loved to build model airplanes. James had no career counseling prior to entering college. He earned a business degree at one of the state's universities and entered the U.S. Marines. After his military training, James enrolled in school to become a professional pilot. He obtained his license but did not complete the degree portion of the school. He is now a captain in a commercial jet with over 12,000 hours of flight time.

It appears that this group had less guidance from family when making their career choices. One student apparently was convinced by a representative of the school to try

aviation when he did not have sufficient math skills to succeed. Two of the other former students who were listed as non-completers because they did not complete their degree programs, did obtain FAA certification and went on to work in the industry. While these two students did not obtain degrees, like the completers their training at this school provided them the opportunities they were seeking.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to determine if there is a relationship between career choice factors and student success in aviation training. This chapter presents a summary of the study, and the conclusions and recommendations from the data collected.

This study addressed the following questions:

1. What are the reasons participating students had for choosing to pursue a career in aviation?
2. What are the academic success rates of participants in this study?
3. Is there a relationship between the reasons for the students' aviation career choice and academic success?

The population of the study was all independent students (students not sponsored by their employer or other source) who were enrolled in 1999 or 2000 in programs leading to an associate degree in the aviation school chosen for this study (N = 1192). Packets containing a survey questionnaire (Appendix A) were mailed to each of these students. After two mailings 318 of the packets were returned as undeliverable. This reduced the available population to 874.

This study used a mixed-methods design consisting of two phases. The first phase was quantitative, using a mailed survey questionnaire. The second phase was qualitative and consisted of an open-ended question in the questionnaire, and follow-up telephone interviews. A total of 57 of the former students returned the questionnaire with a signed consent form, and 34 of these students agreed to participate in follow-up interviews if selected.

The mailed questionnaire consisted of four parts. The first part asked the respondents to provide some demographic data about themselves. Section 2 of the questionnaire asked the respondents when and how they became interested in a career in aviation. After totaling the responses, frequencies were computed. In Section 3 the respondents were asked to rank the factors that influenced their decisions to choose a career in aviation, a rank of “1” being the most influence and a rank of “5” being the least. After converting the ranking into rank points, the sum of the ranking points for each factor ($\sum \text{RankPoint}$) was computed. The factors with the highest $\sum \text{RankPoint}$ were determined to be the most important in influencing career choices.

Section 4 of the questionnaire provided part of the qualitative data collected. The respondents were asked to explain in their own words why they chose to pursue a career in aviation. The questionnaires of those respondents who agreed to a telephone interview were purposefully divided into program completers and non-completers. Three questionnaires were randomly selected from each group to use for the follow-up telephone interviews. The data from the telephone interviews were compared to the data obtained from the open-ended responses in the questionnaires.

This study was constrained by several assumptions and limitations. These included:

1. Students were enrolled in only one aviation school during this study, which covered one specific period. While the results may be generalizable to all of the students in the school used in this study, the results may not be valid for other aviation schools.
2. The final sample was small ($N = 57$), which affected both the internal validity

and the external validity of the study.

3. A third limitation was that the sample was volunteer, or self-selected. This may have affected the external validity in ways unknown to the researcher.
4. The researcher used written notes as the method of data collection in the telephone interviews. It was assumed that this would be manageable due to the small number of interviews and the relatively short duration of each telephone call (approximately 30 minutes each).
5. It was assumed that the researcher was fully aware of personal expectations for the study grounded in his personal experience and used this to mitigate potential biases in data interpretation.

Summary of Findings

The respondents ranked “Aviation is exciting” as the factor that most influenced their decisions to pursue a career in aviation. Two-thirds of the respondents listed *pilot* as the aviation job that was most attractive to them; 70% of the program completers chose pilot, while 60% of non-completers listed pilot as the most attractive career choice. Completers were more likely to have known someone associated with aviation before they decided to pursue a degree in aviation. Completers were also more likely to have flown with family or friends before they began school.

The second most attractive aviation job listed by the respondents was *aircraft mechanic*. While two-thirds of the students had stated they wanted to be pilots, analysis of the data from this study found that only 53% of the respondents had been in a program leading to an associate’s degree in aviation, seeking to become professional pilots. Nearly one-half of the students who responded to the questionnaire chose aviation maintenance

training. The need for a career that paid well was also an important factor in their career choices, and a maintenance job is still a career in aviation.

Thirty-eight of the former students answered that they did complete an associate's degree at the college, 67% of those responding. This was in contrast with the completion rate for all 1192 students who enrolled in 1999 (19 responses) and in 2000 (38 responses), which was only 25% according to the participating school's archival data.

There was little difference in the prior schooling reported by completers versus non-completers. Twenty-one percent of the respondents had some post-secondary schooling before entering the aviation college in this study. The percentage of completers and non-completers with post-secondary schooling was almost the same (22% and 20% respectively). However, the percentage of non-completers who had some military training was more than twice that of the completers.

Completers were more likely to learn about a career in aviation earlier than non-completers were. Almost 66% of the completers stated they learned about aviation careers before the ninth grade as compared to less than one-half of the non-completers. Both groups of students stated that schools had the least influence on their decisions to choose a career in aviation. Family, friends, and media sources clearly were the strongest influences for both completers and non-completers in their career decisions.

Some of the students classified as non-completers because they failed to complete a degree program, did obtain an FAA certification by completing the required classes. This was more frequent among the aviation maintenance students, but some pilots also were only seeking certain licenses. Some schools consider these students completers, while others do not. Frequently prior military students only want to obtain their FAA

licenses, and did not want to complete a degree program.

Conclusions and Discussion

While two-thirds of the participants in this study indicated that pilot was the aviation career that was most attractive to them, only slightly over one-half (53%) had been pursuing an associate's degree in aviation (flight). Only 36.4% of all of the students who enrolled in 1999 and 2000 enrolled in programs to become professional pilots. Currently the school's population consists of 38% flight students and 62% technical students.

When representatives of the school make initial contact with prospective students, 85% of the applicants say they want to be pilots (School President and CEO, personal communication, February 14, 2008). The representatives then begin a screening process by asking questions such as:

- Can you afford the program?
- What kind of work do you like to do?
- Do you like mechanics?
- What would happen if you were hurt and could not fly?

The representatives may tell the applicants if they go into the mechanics program and get their Airframe and Powerplant (A&P) ratings, their employer might pay for them to become a pilot later. Even if they go on to flight school, an A&P license would also give them a career to fall back on in case they were unable to pass a flight physical some time in the future.

Why do the representatives try to switch the applicants? The tuition for an associate's degree for professional pilot at this college is nearly twice the tuition for a

technical degree. If the pilot wants a multi-engine rating, that will add another \$6,000 to their tuition. Most new pilots find work as flight instructors as a means to build flight time before being hired by an airline. To obtain a multi-engine flight instructor rating will cost the pilot approximately an additional \$9,000. Also, the school requires a \$2,000 cash deposit be made to a student's account before they can begin flight training. Most applicants are not financially prepared to meet such costs. This financial reality is one reason there is a smaller percentage of students in the flight program even though the excitement of a flight career makes it appealing and attractive as a career choice.

Aviation is exciting and pilot is the most exciting career. However, its realities suggest several reasons why many students who believe they want a flight career ultimately move into a technical training alternative. When students state they learned about aviation before high school, many probably actually viewed a career in aviation as flying. Their dream is usually to become a jet pilot. Unless they had a friend or family member who worked in aviation, they probably did not understand the time, and the expense, involved in flight training. Students seeking to enter flight training must pass a flight physical and undergo a background investigation. Also, the academic requirements are higher for entry into flight school than that for aviation technical training.

Many secondary school teachers and counselors may not be prepared to help their students make informed decisions about the different careers in aviation. As one respondent stated, their counselor had "Little knowledge about the subject." STEMTEC is a five year project looking for ways to improve education for science and mathematics teachers (STEMTEC, 2008, Mission Statement). This project will also make sure that advisors provide prospective teachers appropriate information on learning styles and how

to incorporate modern educational technology in the classroom. These teachers should be much better prepared to advise students about careers such as aviation.

Because of the college's screening process for many of these factors, the percentage of students enrolling in flight programs at the college is reduced. Some students who switch to mechanic training at the college discover that the mechanics program is not something that interests them. Some of these students, who are adamant about becoming pilots, will switch to pilot training. However, many of these students do not have the financial ability to switch, or are frustrated because they were not initially placed in the program they wanted, and will become dropouts.

The Dean of College Programs for the school in this study stated that attrition at the school has consistently been above 60% for the past ten years (personal communication, July 21, 2003). Yet 67% of the participants in this study reported that they had completed their programs with the associate's degree, as compared to 25% of the total population of 1192 students who enrolled in 1999 and 2000. One might wonder if low graduation rates might affect the college's accreditation status. However, the school's accrediting body, ACCSCT (2006b), requires that schools accredited by them graduate only 35% of the students enrolled in programs of two or more years to meet the minimum graduation requirements for accreditation.

Why did the students in this study report such a high completion rate? This variance may be because completers were more likely to respond to the questionnaire than non-completers were. Morris and Maisto (2002) asserted that poor school performance can result in a drop in self-esteem, and that this is even more likely if the non-completers are convinced that the failures are a result of factors they controlled.

Morris and Maisto also claimed that persons who had bad experiences would like to forget them, and might try to “rewrite” their memories by refusing to talk about these experiences.

The small sample (57 respondents) might have skewed the results. Shavelson (1996) explained that a sample size of 30 or more is sufficient to determine the shape of the sampling distribution. However, the larger the sample, the closer the mean of the sample will be to the mean of the population. Also, if the researcher was able to obtain other samples from this population, the mean of the means of those samples would approximate the population mean.

As Williams (2006, August 27) reported, after the attack on the World Trade Center in 2001, aviation jobs declined sharply. Of the 57 respondents, 19 enrolled in 1999 and 38 enrolled in 2000. The majority of the students enrolled in 1999 could have completed the requirements for an FAA license, dropped their associate’s degree, and accepted employment before 9/11. As one respondent stated, “In 2000 there were jobs abundant.” This might be one reason for the high attrition rate for the entire population. The students who enrolled in 2000 may not have had the jobs available, and decided to remain in school and graduate with a degree. Because twice as many of the respondents enrolled in 2000, this might be one reason for the high completion rate reported by the participants in this study.

Even though this college is a technical school, to obtain an associate’s degree the students must take classes in mathematics, physics, and the humanities. Often these classes are scheduled before the students are allowed to take the technical classes. Like “Chris” in this study, many of the students are not told prior to enrollment that they will

have to pass mathematics and physics. Chris' parents had not attended college, and no one explained to him what he would have to do to be successful as an aviation mechanic. Most of the students must work part-time, and have little time to find academic help. Tinto (1993) explained that if these students find no support from faculty and staff, after a time they either become discouraged or quit. A few will become academically ineligible and are suspended from school.

One solution for some technical students who struggle with the academic classes is to drop the associate's degree and graduate with a diploma. While they are not completers within the degree program under this option, they do have the technical training necessary to obtain FAA certifications, and to work in the aviation industry. Often these students will work for a period of time and then contact the college about how they might complete their associate's degree. Students such as these were labeled "stop-outs" by Tinto (1993). Or, as Choy (2002) found in one study, some students will complete their degrees at another institution.

The data from the study revealed that a much larger percentage of respondents who had been involved in military aviation before school were non-completers (25% compared to 6%). Sometimes, once into the training, these students find that the careers for which they are training for are not what they believed them to be. Like other students, the prior military students may have discovered that they were employable with only the technical training, and decided not to complete a degree program. Many of these students are adult learners who have families to support and want to get into the industry as quickly as possible. Hagedorn (2005) described this phenomenon by stating that "dropouts" may sometimes be students who have achieved their goals and leave higher

education satisfied with their experience.

Some of the prior military students are in school for vocational rehabilitation. This situation, plus the adult status of prior military students, suggest several possible reasons for a higher non- completion rate. To obtain medical attention from the Veterans Affairs hospital, military veterans must travel out of town, and absences can result in these students falling behind in class. The veteran student may have been out of school for several years and need special attention. Also, it may be a problem for the prior military students to adjust to being in class with younger students, who may not understand the special needs the veterans may have.

The school provides a clerk to assist the veterans with scheduling classes and obtaining their tuition benefits. When problems arise, the veterans must speak with their VA representative by telephone, or again miss class to drive to another city. The school has no organization on campus for the veterans. This is a problem caused by an internal factor in the school, mentioned by Tinto (1993) as one potential cause of student non-persistence. Also, there is little activity at the school to involve families of the students. Moxley et al. (2001) claimed that external communities of support such as community services could help institutions reduce attrition.

The data in this study appear to indicate that at least two factors external to the school contribute to higher success in aviation training:

1. Students who are made aware of aviation as a career earlier are more likely to succeed in their training.
2. Students who had either friends or family in aviation who could explain what a career in aviation consisted of were more likely to succeed.

Students who were well informed were more likely to have career goals that would allow them to be integrated into the program, and the school, of their choice. These students were apparently better prepared to deal with the problems they encountered in school because they understood how the experiences in school would help them reach their career goals.

Students who chose aviation only because they thought it would be fun are apparently more likely to be unprepared for college, both academically and financially, than those students who really understood the demands of the training. Additionally, those students who were convinced to switch from the aviation career of their choice to another appear to be more at risk to become dropouts. Friends and family who have had experiences in the industry are more likely to help the students make informed decisions rather than admission representatives who may put the needs of the school before the needs of the students.

School counselors were ranked by the respondents as having the least influence on their choice of aviation as a career (see Table 9). Laughlin (2001) wrote that counselors at Native American schools were often unprepared to assist students in making a career decision. This may well be the case in many small school districts throughout the country. While some teachers may have had some experiences in aviation (such as serving in the military), counselors are less likely to have been involved in careers such as aviation mechanics.

Even though Smith (1999) reported that the Experimental Aircraft Association provides curriculum materials to schools, some schools do not take advantage of these resources. There are many scholarships available for aviation training that counselors

may not be aware of. The school in this study offered a workshop for teachers and counselors last summer. The school offered to pay the teachers' travel expenses and living expenses if they attended the workshop. The workshop was cancelled because of an insufficient response.

Recommendations

The school in this study is working hard to improve student retention. The findings and conclusions of this study can provide some insight into development of new programs that might assist the school in this effort. It must be understood that these new programs will not provide immediate relief in most cases. The school must be committed to long-term goals that can become a part of their strategic plan.

The following recommendations, to be a part of the school's student retention program, are offered:

- Partner with public school systems in the areas where the school is licensed to sell its programs in an effort to increase career awareness. These programs should begin as early as elementary school, and continue throughout high school.
- Sponsor teacher workshops at the college, and participate in such workshops that may be offered at local schools, to make educators more aware of the types of careers that exist in aviation. High school counselors should be provided materials that would assist them in answering the questions of students interested in pursuing a career in aviation.
- Work with professional groups in the aviation industry in their efforts to promote aviation careers to young people. Utilize the resources of such

groups as the Aircraft Owners and Pilots Association, Professional Aviation Maintenance Association, Aircraft Electronics Association, Women in Aviation, and others to provide students with chances to become involved with aviation professionals, and to understand the true requirements of various aviation careers.

- Promote the establishment of more student organizations at the school. In addition to local chapters of professional organizations, support groups for veterans, families of students, and students with special needs can provide assistance for students and help them to feel more a part of the school community.
- Use some instrument such as *My Vocational Situation* to assist applicants in making their career choices.

The earlier students make decisions to pursue careers in aviation, the better the chance that they will be prepared for college when the time comes. Through early and accurate career awareness and guidance, students can be advised about what type of classes they need to prepare for college; they can take part in activities such as demonstration flights and maintenance contests to see if aviation is what they believed it to be; and they can begin to prepare financially for the cost of a career in their chosen field.

The following recommendations are offered for further research:

- Repeat this study using another method to collect data that would increase the sample size.
- Repeat this study at another aviation school to determine if the findings might be generalizable, or if they are unique to this school.

- Conduct a follow-up study to determine the difference in jobs, earnings, and other factors that exist between completers and non-completers.
- Identify the factors that resulted in the lower completion rates for students with prior military service.
- Determine how many school districts where the college sells its programs have career awareness programs before high school.
- Determine if the college's participation in career awareness programs in public schools increases the number of applications the college receives.
- Conduct a study to determine if students who participate in career awareness programs before high school are more likely to persist in college.

Increasing student retention should be an essential part of any college's strategic plan.

Many questions remain unanswered concerning why students persist in the aviation college that was the subject of this study, or why they drop out. This study was a first step in such an understanding. Hopefully, this study will open a line of research that can help to find the answers to some of these questions, and ultimately to better meet the needs of the student and the workforce population the college serves.

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APPENDICES

APPENDIX A
SURVEY INSTRUMENT

**A Study of Career Choice Factors
and Students' Academic Success at an Aviation School**

This questionnaire is designed to determine why students choose careers in aviation, and to determine if there is a relationship between the reasons for career choice and student academic success in aviation training. All responses will be confidential: do not include your name or any identifying numbers on this questionnaire.

1. Please answer the following questions about your training at Spartan School of Aeronautics by circling the correct response.

- | | | |
|--|-----|----|
| Did you enter Spartan as an associate degree student? | Yes | No |
| Did you add an associate degree after entering Spartan? | Yes | No |
| Did you complete an associate degree at Spartan? | Yes | No |
| Did you graduate from Spartan without an associate degree? | Yes | No |
-

2. Please check the answer that best describes your interest in aviation as a career.

When did you first become interested in a career in aviation?

- Before the 9th grade
- 9th to 12th grade
- After the 12th grade

How did you first learn about aviation careers?

- In school
- From family or friends
- Media (Movies, television, books, etc)
- Advertising by aviation schools

Which of the following aviation jobs was most attractive for you?

- Pilot
- Flight Attendant
- Aircraft Mechanic
- Air Traffic Controller

What types of aviation activities were you involved in before entering Spartan? Check all that apply.

- Explorer Scouts
- High school or college ROTC
- Civil Air Patrol
- Military
- Flying with friends or family
- Training at another school or facility
- None

Who did you know that worked in the aviation industry, civilian or military, before you started your aviation career? Check all that apply.

- Family member
 - Friend
 - Teacher
 - Neighbor or acquaintance
 - No one
-

3. Please rank the following using “1” to be the greatest influence, “2” the next highest, through “5”, the least influence.

Which of the following factors do you believe most influenced your decision to choose a career in aviation?

- A career in aviation is exciting
- A career in aviation pays well
- A friend or family member works in the aviation industry
- There is a great demand for workers in the aviation industry
- Aviation is one the leading careers in computers and technology

Who do you believe had the most influence in your decision to choose a career in aviation?

- Family member
- Friend
- Teacher
- School Counselor
- Spartan Representative

What was the factor that most influenced your decision to attend Spartan School of Aeronautics?

- Knew someone who had attended Spartan
- Spartan's reputation is well-known in the industry
- Spartan was the only aviation school I was aware of
- School counselor recommended Spartan
- Spartan representative convinced me to attend Spartan

4. In your own words, please state why you made the decision to pursue a career in aviation.

5. Please answer the following questions about yourself by checking the appropriate response.

Gender

- Male
- Female

Age when entering Spartan

- Under 18 years of age
- 18 through 20 years of age
- 21-25 years of age
- 25-30 years of age
- Older than 30 years of age

Marital Status

- Single
- Married

Prior schooling before entering Spartan

- GED
- High School Graduate
- Associates Degree
- Bachelors Degree
- Other List: _____

Military service

- U.S. Air Force
- U.S. Navy
- U.S. Army
- U.S. Marine Corps
- Other List: _____

APPENDIX B
SURVEY LETTER

Date

Dear

Your class at Spartan College of Aeronautics and Technology has been selected to participate in a research study titled “A Study of Career Choice Factors and Students’ Academic Success at an Aviation School.” This research is being conducted through Oklahoma State University, and has been reviewed and approved by the Institutional Review Board of Oklahoma State University.

This study will describe the reasons why students choose careers in aviation and determine if there is a relationship between the reasons for career choice and academic success. The study will consist of a survey questionnaire and a telephone interview.

Your participation is voluntary!

Your participation would be appreciated. It should take you no more than thirty minutes to complete the questionnaire. If you would like to participate in the telephone interview portion of the study, the interview will take about thirty minutes. If you do not wish to participate in the study, please return the forms in the enclosed envelope.

If you choose to participate in the survey portion, sign the enclosed consent form and complete the questionnaire. Return both forms in the enclosed envelope.

If you would be willing to participate in a follow-up telephone interview, please sign the enclosed consent form and return it with the completed questionnaire. The telephone interviews will be conducted after the survey portion of the study has been completed.

Do not put your name on the questionnaire.

I will separate your consent form from the questionnaire, and only I will have access to the completed questionnaires. All records of this research will be kept exclusively by the researcher, under lock and key at his residence. After the research has been concluded, and the dissertation approved, all records will be destroyed.

Your answers will be kept confidential and at no time will your answers appear with your name, your program, or your school. A copy of the consent form is on the back of this letter for your future reference. Your participation is voluntary and you may withdraw from the study at any time if you choose to do so. No direct or indirect benefits are associated with your participation in this research study.

Thank you for taking the time to assist me with this research. If you have any questions, please contact me at 1-800-331-1204. If you have questions regarding your rights as a research participant, you may call the Office of Research Compliance Division of the Vice President for Research at 405-744-5700. Your participation is greatly appreciated.

Sincerely,

James F. "Frank" Pendergrass
Doctoral Student at Oklahoma State University
3516 S. Toledo Place
Tulsa, OK 74135
Telephone: 918-743-0546 (Home)
 1-800-331-1204 (Work)
jpendergrass3@cox.net

APPENDIX C
PARTICIPANT CONSENT FORM

**A Study of Career Choice Factors
And Students' Success at an Aviation School**

Investigators: James F. Pendergrass, MS, Graduate Student, Oklahoma State University
Dr. Lynna J. Ausburn, PhD, Advisor

Purpose: This is a research study to describe the reasons why students choose careers in aviation and to determine if there is a relationship between the reasons for career choice and academic success. All students who enrolled in Spartan School of Aeronautics in the year 2000 are being asked to participate in this study. The study will seek to determine why you chose a career in aviation and why you were successful in your training, or why you did not persist in your chosen field of study.

Procedures: You will first be asked to complete a questionnaire containing questions about your training at Spartan, your reasons for choosing a career in aviation, and some demographic data about yourself. This questionnaire should take no more than thirty minutes of your time. **Your participation is entirely voluntary.**

After the survey is completed, ten students will be randomly selected to participate in a telephone interview. If you choose to participate in these interviews, this will allow you to more fully explain your reasons for choosing a career in aviation and your experience at Spartan. These interviews will **not** be audiotaped. The interview should last about thirty minutes. **Again, your participation is entirely voluntary.**

Risks of Participation: **There are no known risks associated with this project which are greater than those ordinarily encountered in daily life.**

Benefits: Participants in this study will not realize any direct benefits. However, this study should provide information that will enable schools in the future to better design programs to assist students in their efforts to remain in school and complete their chosen field of study.

Confidentiality: All of the information obtained in this study will be stored at the residence of the principal investigator and kept under lock and key. Data files, consent forms, and codes will be stored in separate locations. The principal investigator will conduct all telephone interviews. No one other than the investigators and the OSU IRB will have access to consent records and data files. The data will be compiled and reported in a dissertation. No individual data, real names of schools, or of students will be used. All information will be destroyed after the dissertation is approved, not later than two years after the completion of the data collection. **The OSU IRB has the authority to inspect consent records and data files to assure compliance with approved procedures.**

Compensation: No compensation will be offered for your participation in this study.

Contacts: If you have any concerns or questions, or if you wish to end any participation in the study, you may contact:

James F. Pendergrass, Principal Investigator
3516 S. Toledo Place
Tulsa, OK 74135
jpendergrass3@cox.net

Dr. Lynna J. Ausburn, Advisor
College of Education
Willard Hall 217
Oklahoma State University
(405) 744-8322
lynna.ausburn@okstate.edu

APPENDIX D
TELEPHONE INTERVIEW FORM
COMPLETERS

**A Study of Career Choice Factors
and Students' Academic Success at an Aviation School**

Telephone Interview Script (Completers)

Hello _____, this is Frank Pendergrass. Thank you for agreeing to participate in this telephone interview. Do you have a few minutes now to answer a few questions?

Thanks. These questions will help to better understand how your choice of aviation as a career affected your studies at Spartan.

Telephone Interview Questions

1. Have you signed and returned the consent for giving me permission to conduct this interview?
2. Do you have any questions about your participation in this research study?
3. Once again, please describe your reasons for choosing a career in aviation.
4. When you arrived in Tulsa, what were your impressions of Spartan?
5. Did the staff at Spartan explain the type of career your training would prepare you for?
6. Describe the indoctrination you received before beginning school.
7. Did you have an opportunity to talk with students who were already taking classes in your program?
8. Did you encounter many problems while you were in school at Spartan? Describe how you were able to overcome these problems.
9. Describe any changes the school might make to help students complete their training more easily.
10. Are you currently working in the career field in which you trained? If so, is the work what you expected? If not, why are you not working in your chosen field?
11. Would you recommend aviation training to a friend or family member? Why or why not?

Thanks _____, I appreciate your help. Your answers will remain

confidential. None of the information will be linked with your name, and none of the information will be shared with the school.

APPENDIX E
TELEPHONE INTERVIEW FORM
NON-COMPLETERS

**A Study of Career Choice Factors
and Students' Academic Success at an Aviation School**

Telephone Interview Script (Non-completers)

Hello _____, this is Frank Pendergrass. Thank you for agreeing to participate in this telephone interview. Do you have a few minutes now to answer a few questions?

Thanks. These questions will help to better understand how your choice of aviation as a career affected your studies at Spartan.

Telephone Interview Questions

1. Have you signed and returned the consent for giving me permission to conduct this interview?
2. Do you have any questions about your participation in this research study?
3. Once again, please describe your reasons for choosing a career in aviation.
4. When you arrived in Tulsa, what were your impressions of Spartan?
5. Did the staff at Spartan explain the type of career your training would prepare you for?
6. Describe the indoctrination you received before beginning school.
7. Did you have an opportunity to talk with students who were already taking classes in your program?
8. Describe the problems you encountered that prevented you from completing your training.
9. Describe any changes the school might make to help students complete their training more easily.
10. Describe any training you have completed after leaving Spartan.
11. Describe the type of work you are currently doing. If you are not working in aviation, do you still have a desire to pursue an aviation career?

Thanks _____, I appreciate your help. Your answers will remain confidential. None of the information will be linked with your name, and none of the information will be shared with the school.

APPENDIX F
INSTITUTIONAL REVIEW BOARD
APPROVAL FORM

Oklahoma State University Institutional Review Board

Date: Friday, August 26, 2005
IRB Application No ED069
Proposal Title: A Study of Student Career Choice Factors and Student Academic Success at an Aviation School
Reviewed and Processed as: Expedited

Status Recommended by Reviewer(s): Approved Protocol Expires: 8/25/2006

Principal Investigator(s)

James F. Pendergrass
3516 S. Toledo Pl.
Tulsa, OK 74135

Reynaldo Martinez
1500 N. Patterson Street
Valdosta, GA 316980080

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 415 Whitehurst (phone: 405-744-5700, beth.mcternan@okstate.edu).

Sincerely,



Sue C. Jacobs, Chair
Institutional Review Board

Oklahoma State University Institutional Review Board

Date: Tuesday, August 22, 2006 Protocol Expires: 8/21/2007
IRB Application No: ED069
Proposal Title: A Study of Student Career Choice Factors and Student Academic Success at an Aviation School

Reviewed and Processed as: Expedited
Continuation

Status Recommended by Reviewer(s): **Approved**

Principal Investigator(s):

James F. Pendergrass
3516 S. Toledo Pl.
Tulsa, OK 74135

Lynna Ausburn
217 Willard
Stillwater, OK 74078

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modifications to the research project approved by the IRB must be submitted for approval with the advisor's signature. The IRB office **MUST** be notified in writing when a project is complete. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

- The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

Signature:


Sue C. Jacobs, Chair, Institutional Review Board

Tuesday, August 22, 2006
Date

VITA

James Franklin Pendergrass

Candidate for the Degree of

Doctor of Philosophy

Thesis: A STUDY OF CAREER CHOICE FACTORS AND STUDENTS'
ACADEMIC SUCCESS AT AN AVIAITON SCHOOL

Major Field: Education

Biographical Data:

Education: Completed the requirements for the Doctor of Philosophy in Education at Oklahoma State University, at Stillwater, Oklahoma in May, 2008; Master of Science in Occupational and Adult Education, Oklahoma State University, Stillwater, Oklahoma, August, 1997; Bachelor of Science in Business Administration, University of Tulsa, Tulsa, Oklahoma, May 1983.

Professional Work Experience: Spartan College of Aeronautics and Technology, Tulsa, Oklahoma, Director, South Campus Education, 2007-Present, Instructor, Bachelor of Science in Aviation Management, 2001-2007, Department Head, Avionics and General Education, 1987-2001, Technical Instructor, 1981-1987; West Plains High School, West Plains, Missouri, Substitute Teacher, 1977-1981; United States Navy, Aviation Electronics Technician, 1955-1977.

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Date of Degree: May, 2008

Institution: Oklahoma State University

Location: Stillwater, Oklahoma

Title of Study: A STUDY OF CAREER CHOICE FACTORS AND STUDENTS'
ACADEMIC SUCCESS AT AN AVIATION SCHOOL

Pages in Study: 118

Candidate for the Degree of Doctor of Philosophy

Major Field: Education

Scope and Method of Study: The purpose of this study was to describe the reasons why students choose careers in aviation, and to determine if there is a relationship between the reasons for career choice and student academic success in aviation training. This study used a mixed-method empirical design that incorporated both quantitative and qualitative data gathering and analysis techniques, using a survey and telephone interviews.

Findings and Conclusions: The participants in this study ranked "Aviation is exciting" as the factor that most influenced their decisions to pursue a career in aviation, and two-thirds listed *pilot* as the aviation job that was most attractive to them. Even though the completion rate for the population in the study was only 25%, 67% of the students who responded stated they had completed an associate's degree. Program completers were more likely to have learned about aviation careers earlier than non-completers, and both completers and non-completers indicated that family, friends, and media sources were the strongest influence in their career choices. The data in this study appear to indicate that at least two factors external to the school in the study contribute to higher success in aviation training.

1. Students who are made aware of aviation as a career earlier are more likely to succeed in their training.
2. Students who had either friends or family in aviation who could explain what a career in aviation consisted of were more likely to succeed.

Students who were well informed were more likely to have career goals that would allow them to be integrated into the program, and the school, of their choice. These students were apparently better prepared to deal with the problems they encountered in school because they understood how their experiences in school would help them reach their career goals.

Lynna J. Ausburn, Ph.D.