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Identification of Noncognitive Factors as Predictors of Freshman Academic Performance and Retention in a Community College Setting

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IDENTIFICATION OF NONCOGNITIVE FACTORS AS PREDICTORS OF FRESHMAN ACADEMIC PERFORMANCE AND RETENTION IN A COMMUNITY COLLEGE SETTING

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ABSTRACT

IDENTIFICATION OF NON COGNITIVE FACTORS AS PREDICTORS OF ACADEMIC PERFORMANCE AND RETENTION IN A COMMUNITY COLLEGE SETTING

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This study identified noncognitive factors (via the use of discriminant analysis) that impact freshmen academic performance and retention in a community college setting. The study used a modified version of the Freshman Survey, that had been validated for use at an urban four-year institution, to determine the predictive validity of the instrument for use with first semester freshmen in a two-year college setting. Existing research suggests that cognitive factors can, at most, explain 10 to 20 percent of the variance in student retention and academic performance. The remainder (approximately 80 percent) of the variance in student academic performance and retention lies in the noncognitive domain.

The survey was successfully replicated at a small, rural community college located in the Mid-Atlantic region of the United States. The study findings, using probation and attrition scores, indicated that overall noncognitive factors discriminated between those students who were at risk of academic difficulty/academic success and were significant at the $p < .001$ level. The analysis provided similar significant findings for attrition and retention. The overall hit rate for number of cases correctly classified for academic difficulty was 37.14%. The overall hit rate for number of students correctly classified as drop-out was 56.8%. The findings also indicated that, in general, the higher

a student's discriminant score the greater the probability of student academic difficulty or attrition. The results of this study can provide college counselors and instructors with additional student information that can be used to develop effective early intervention strategies. Research suggests that early intervention can have a positive impact on student academic performance and retention.

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CHAPTER I

INTRODUCTION

Introduction

This study used a modified version of the Freshman Survey, currently a component of a mid-Atlantic urban university's institutional assessment program, in an attempt to validate the survey for use in the community college setting. The Freshman Survey uses a series of attitude and opinion scales designed to identify noncognitive factors. These factors are generally social or psychological in nature. Research estimates that cognitive factors, e.g. GPA, SAT scores, account for approximately 10 to 20 percent of the variance in student retention and academic success. The remainder of this variance must necessarily lie in the noncognitive domain. Significant noncognitive factors impacting student retention have been successfully identified at the four-year level. The results obtained from the survey have been successfully used to predict freshman academic success and retention at the four-year level. Successful replication of this survey at the two-year level will hopefully yield similar results that can be used to enhance the ability of Virginia's community college students to reach their educational goals. Replication of this survey occurred at a small community college, a member of the Virginia Community College System. Data was collected from a population sample of one hundred and fifty three curricular (degree or certificate seeking) freshmen.

Background

Retention of students at community colleges and four-year institutions has been the subject of much research (Astin, 1975; Creamer, 1980; Bean, 1985; Tinto, 1987). Researchers have developed many strategies designed to improve student retention. New

student orientation programs, mentor programs, faculty advising, early alert systems and intrusive orientation models are all strategies that have been studied and implemented with varying degrees of success (Earl, 1986; Tinto, 1987; Lewallen, 1993). Beatty-Guenter (1994) identified four different types of retention strategies prevalent in the literature about retention programs at community colleges. The four types were: (a) sorting of students into homogenous subgroups, (b) supporting of students in dealing with life's problems or responsibilities, (c) connecting of students to each other and the institution, and (d) transforming of students and/or the community college. Each of these strategies can be used individually or in conjunction with each other depending on a student's individual needs.

The Research Problem

The Virginia Community College System (VCCS) loses an average of thirty-one percent of its freshman students by the end of their first semester in school (VCCS, 1998). The problem and study of student retention at the post secondary level is not a new phenomenon (Panos & Astin, 1968; Rossman & Kirk, 1970; Astin, 1975; Tinto, 1987). However, it is a major area of concern that has particular relevance as the system heads into the new millennium.

Hirshberg (1991) in an article entitled, *The Role of the Community College in Economic and Workforce Development* stated that, "Community colleges have moved into positions of prominence in economic and workforce development activities across the nation" (p. 1). Industry faces a severe labor shortage in Virginia and is looking to the VCCS to meet much of its current and future skilled labor needs. The Northern Virginia Regional Partnership estimates that 23,000 information technology jobs are unfilled in its

region alone. Faced with industry demands for skilled labor, the VCCS can ill-afford to continue losing thirty-one out of every one hundred students that come through its doors. Improving retention of VCCS students is a necessity today as never before. Virginia's current governor has made workforce development a top priority of his administration and the VCCS has been given a lead role in this workforce initiative (Bacon, 1999).

This impetus, while providing the VCCS with a tremendous opportunity to play a leading role in the development of Virginia's future workforce, also places pressure on the community college system to produce an adequate supply of trained graduates. Competition to meet industry demands for qualified, well-trained workers exists in the form of private career schools such as ECPI College of Technology, Kee Business College, Tidewater Tech and National Business College. Furthermore the number of corporate universities has increased from 400 in 1988 to more than 1,000 today (Walker, 2000). The Virginia Association of Private Career Schools estimated a total fall 1998 enrollment of 25,000 students in their institutions. This is compared to a total fall 1998 enrollment of 132,521 students in the Virginia Community College System. According to Mark Singer, executive director of the Virginia Association of Career Schools, "for-profit career schools educate about 70 percent of the state's electronic technicians and 85 percent of its computer technicians." Career schools can put together a program to meet the demand for a new skill in a fraction of the time it takes public institutions (Bacon, 1999, p. 30). The competition stands ready to step in if the VCCS cannot retain and graduate sufficient numbers of students to meet the employment needs of industry.

The diversity of the community college student presents a unique challenge to the system. Significant variations exist in terms of prior academic preparation, age,

ethnicity, socioeconomic status and family structure. The typical first semester community college freshman may range in age from a recent high school graduate of eighteen to a fifty-five year old individual. Fifty-four percent of the students in Virginia's system are twenty-five years of age of older (VCCS, 1998). Many community college students are employed on either a full or part-time basis and have family and financial obligations (McCarten, 1988, Tinto, 1994). The transition into college life is easier for some students than for others. The eighteen-year old freshman just out of high school does not have competition for his/her time when compared to a thirty-five year old freshman, mother and wife, who has to balance time for family as well as time for study. The eighteen-year-old may only have a part-time job and live at home with his/her parents. The needs of both freshmen are entirely different and it is the responsibility of the community college to be responsive to those needs if it expects to successfully retain and educate both students. Such diversity represents a difficult challenge for the community college system to successfully retain and prepare students to meet the labor needs of Virginia's industry. This requires the exploration of a variety of retention strategies designed to improve the production and quality of graduates of the system.

Traditionally, community colleges have maintained an open-door policy regarding admission of students. This policy assumes that community colleges can meet the needs of its prospective students, at whatever level of preparedness the students present with. There are many instances where the open door inadvertently becomes a revolving door with regards to student retention. The Virginia Community College System was originally designed to make higher education opportunities available to every Virginia resident. It strives to assure that individuals of all ages and backgrounds in the diverse

regions of the Commonwealth of Virginia are given a continuing opportunity for the development and extension of their skills and knowledge through quality programs and services that are financially and geographically accessible (Vaughan, 1987).

Purpose

The purpose of this study was to determine whether a modified version of the Freshman Survey had predictive validity at the two-year level, for identification of significant noncognitive factors that may impact the academic success and retention of first semester freshmen. Establishing the validity of the Freshman Survey at the two-year level gives the VCCS an additional asset that can be used to enhance the retention efforts of the entire system. The Freshman Survey was designed by Pickering, Calliotte and McAuliffe (1992), for use in a public four-year institution to identify noncognitive predictors of student retention. Their survey was factor analyzed to identify specific noncognitive predictors of student retention. The results of their survey produced 16 factors that could be used in combination with cognitive and demographic factors to identify students who may need additional assistance in achieving their academic goals. The survey was validated at the four-year level and is in use today.

Retention Methodologies

Lewallen (1993), helped develop an intervention technique called "early alert" that has been utilized for improving student attrition and retention. "Early alert" is the identification of students within the first three or four weeks of the semester who are experiencing academic difficulty. The purpose of "early alert" was to develop a follow-up system to ensure regular monitoring of student progress. An Early Advantage Referral Form (EARF) was developed and used by instructors to identify students in academic

difficulty. Initially this technique originated in the four-year arena but has subsequently been adapted for use in the two-year setting. The study investigated the effect of two different types of early alert strategies. The first focused on students in basic skill classes. The second focused on students enrolled in curricular courses. The study found that thirty-five percent of those students identified through the early alert system, who followed through on the referral successfully completed the course. Seventy percent of those students who followed through re-enrolled the next term while only 50% of those students who did not follow through re-enrolled.

Earl (1986) developed an intervention technique called "intrusive counseling". He discussed intrusive counseling at a 1983 presentation to the American Personnel and Guidance Association. According to Earl: "Intrusive counseling is a response to retention needs and the high cost of losing students who could have been helped. By interfering in the student's life with 'you need help and you can get it here,' when the first signs of academic problems are diagnosed, counselors play a new role as helpers in higher education" (p. 6). The study examined 74 freshmen who were placed on probation at the end of their first semester and who were exposed to intrusive counseling via enrollment in a special orientation class. The results indicated that those students (the experimental group) who participated had a statistically (.05 level of confidence) higher semester and cumulative grade point average than students in a control group of freshman students also on probation, but who were not exposed to a special orientation class. The results also showed that the suspension rate was almost fifteen percentage points lower in the experimental group than in the control group. The highest grades and retention rates were attained by the experimental students enrolled in the orientation class.

In the fall of 1998, the Department of Workforce Development Services at Eastern Shore Community College instituted a group counseling pilot program. The program was designed to facilitate the academic and social integration of first semester freshman, which hopefully would improve retention. An increase in the dropout rate within the first three weeks of a semester had been observed over a five-year period. The purpose of the pilot program was to improve retention by intervening at the beginning of the semester and establishing rapport and a personal connection with students before problems arose that would place the students in academic jeopardy, causing them to give up and drop out.

The difference in this intervention technique as compared to Earl's (1986) and Lewallen's (1993) was that this intervention began during the first week of class and was mandatory for all students who were provided financial assistance under the Job Training Partnership Act (JTPA). Lewallen's technique was largely dependent on the voluntary participation of instructors and Earl's intervention did not start until the second semester and involved students who were already in academic jeopardy. Sixty-one first semester students participated in the project that included a combination of the strategies identified by Beatty-Guenter (1994). Intrusive counseling was the guiding principle. The groups were homogenous according to program of study and met outside of class time. The groups met for one hour each week with a counselor for fifteen weeks in both the fall and spring semesters. Topics discussed in the meetings included: study skills, time management, stress management, personal and professional relationships, college services available to students e.g. resume writing and placement services, financial aid and budgeting. Other topics were addressed as warranted and included domestic violence and sexually transmitted diseases.

For the purpose of the pilot program, counseling was termed "group sessions". Sixty-one students began the program, and fifty-one were still in school at the end the second semester, resulting in an eighty-four percent retention rate. All of the students who participated in the group sessions felt that the sessions helped them cope with the transition into community college life. Informal discussions with instructors indicated that they believed that the group sessions were beneficial to the students and that they should continue. The results of this pilot program were encouraging.

These intrusive techniques, while having a positive impact, do not distinguish between students that may or may not need assistance in achieving their academic goals. These types of techniques are subjective in nature and tend to take a "shotgun approach" to the problem of retention and academic performance. Validation of the Freshman Survey at the two-year level may provide a more scientific approach that, when used in combination with intrusive techniques, improves the effectiveness of intervention into the lives of students. As an example, the group counseling program at Eastern Shore Community College could use the predictive ability of the Freshman Survey to accurately predict which students need assistance thus eliminating the mandatory inclusion of all students in a program of study. Instructors could use the survey results to identify those students in their classes that may need more support at the beginning of the semester. The Freshman Survey may provide the catalyst needed to strengthen existing intervention techniques.

It is the premise of this study that a validation of the results of the Freshman Survey at the two-year level will enhance the ability of the VCCS to improve the academic success of first semester students, thus improving system wide retention.

Theoretical Perspective

Earl (1986) wrote a dissertation entitled, *The Impact of an Intrusive Orientation Model on Retention and Grade Point Average of Second Semester Freshmen on Academic Probation at an Urban University.* Earl introduced his model concept of intrusive counseling as an intervention strategy aimed at improving the retention of students on academic probation. Tinto (1988) in an article entitled, *Stages of Student Departure*, described what he referred to as stages of passage in the college student career: separation, transition, and incorporation into college. Tinto adapted these stages, the concept of which originated in a study entitled, *The Rites of Passage,* by Arnold Van Gennep, as cited in Tinto (1988) to the process of student passage from one community such as high school and family, to another, such as college. Essentially, the college student must successfully navigate each stage to survive his/her college career. Otherwise, departure from college can occur at any of these stages. Students undergo a paradigm shift in the way they relate to the world they grew up in and to the world of education. Tinto stated:

> Whatever forms of action institutions take on behalf of student retention, those actions should be concentrated on the very early stages of the student's college career rather than on later stages after serious problems have surfaced. Though institutions must not ignore student needs beyond the first year, it is evident that the first year, indeed the first semester, is critical to the students' eventual persistence until degree completion. The notion that "front-loading" of institutional action is, in this view, an appropriate strategy to reduce the early incidence of student departure. Rather than concentrate their attention on the few

days just prior to the beginning of the academic year, orientation programs should span the first six weeks of the first year, if not the first semester. (p. 451)

First semester students must navigate the academic and social adjustments necessary in order to be successful in completing their college education. Validation of the Freshman Survey for a two-year setting in a public community college was inclusive of the full spectrum of those who comprise the community college population. This included students whose goal was to earn a one-year certificate or an associate degree or to transfer to a four-year institution. The ability to predict potential at risk students in a timely fashion is essential if retention is to increase satisfactorily for both students and institutions.

Significance of the study

This study built on previous research conducted by Creamer (1980), Earl (1986), Tinto (1988, 1993, 1994), Lewallen (1993), Beatty-Guenter (1994) and others as it relates to retention of community college students in their first semester. Retention research has investigated different variables and their relationship to retention including: GPA, full-time vs. part-time students, gender, ethnicity, socioeconomic status, age and financial assistance. Within the last decade more research has been focused on the retention problems of students at public community colleges (Bonham & Luckie, 1993; Lewallen, 1993; Beatty-Guenter, 1994, Napoli & Wortman, 1996). Since characteristics of the typical community college student are different from the typical four-year college student, vis a vis academic level, socioeconomic status, average age, goals etc., the replication of a successful four-year research paradigm for the community college setting is warranted, as we search for solutions to the current challenge of high attrition among

community college students.

Research Questions

The following research questions were addressed:

Research Question 1. Are there noncognitive factors that can be used to predict academic difficulty or success of first semester students at the two-year level?

Research Question 2. Are there noncognitive factors that can be used to predict attrition or retention of first semester students into the second semester of the freshman year?

Research Question 3. What percent of the variance in academic performance can be accounted for by noncognitive factors?

Research Question 4. What percent of the variance in retention/attrition can be accounted for by noncognitive factors?

Definition of Terms

For purposes of this study the following operational definitions apply:

1. Dropout - Students who do not reenroll in the spring semester of their freshman year.

2. Nondropout - Students who reenroll in the spring semester of their freshman year.

3. Curricular student - Students enrolled in a formal program of study leading to a certificate or associate degree.

4. Academic difficulty - Failure to maintain a GPA of 2.00 or greater at the end of the first semester.

5. Criterion Variable(s) - The criterion variables of interest in this study are students who are at risk of academic difficulty and students who are at risk of dropping out.

6. Predictor Variable(s) - Noncognitive factors used to identify a student's potential of being in academic difficulty or dropping out.

Delimitations and Limitations

1. There was no random selection or random assignment of subjects. The subject pool consisted of the entire population of first semester freshman students enrolled at the study site.

2. The study was confined to validation of the results of a freshman survey currently used at a urban four-year institution to see whether similar results can be achieved at the two-year level in the Virginian Community College System.

3. A self-reported instrument was used to identify significant noncognitive variables that impact student academic success and retention.

4. This was a correlational study. Causality cannot be inferred from the study results.

5. Generalizability of the results is limited to freshman students at the two-year level. Successful replication of the survey at other two-year campuses in the VCCS will enhance the generalizability of the results.

Summary

To provide industry with a highly skilled workforce is a state mandate that the VCCS must meet. To be successful in supplying industry demands for such a workforce now and in the future, it is important that the system retain a much higher percentage of its first-year students. Failure to meet the demands of Virginia's industry in a timely fashion may force industry to look for other suppliers to meet its needs. The competition previously mentioned exists and is formidable. Indeed, the ability of the Commonwealth of Virginia to promote economic development and attract new industry and jobs for its citizens depends on the ability of the community college system, in conjunction with Virginia's four-year institutions, to meet an increasing demand for a highly skilled

workforce. Human capital is a critical component of economic development and community colleges are in a unique position to promote the training and education to develop this resource (Hirshburg, 1991).

CHAPTER II

THE LITERATURE REVIEW

Orientation of the Review

The literature and research on retention is detailed and extensive. This review traces the more recent history of retention research from the nineteen sixties and seventies, with its primary emphasis on the four-year college student population, through the nineteen eighties and nineties and the evolution of retention research into the two-year college student arena. This review is divided into the following sections: Overview and Scope of Retention Research, Terminology Related to Retention and Attrition; Factors Related to Retention and Attrition; Retention Models, Programs and Strategies.

Overview and Scope of Retention Research

Retention research originated with an emphasis on the traditional four-year institution and its traditional student body (Panos & Austin, 1968; Rossman & Kirk, 1970; Austin, 1975). Research on retention has evolved from a primary focus on the traditional four-year college student to more emphasis and focus on the two-year college student (Zwerling, 1980; Gates & Creamer, 1984; Opp & Colley, 1986; Brooks-Leonard, 1991; Burgess & Samuels, 1999). Concurrently, the dynamics of the study of student retention also evolved as community colleges provided an avenue of higher education to the general population that was previously only accessible to an elite cadre of individuals. One can follow the work of a single researcher (Tinto, 1975, 1987, 1993, 1994) over the last three decades as he expanded his focus from the study of student retention at four-year institutions to include two-year community colleges.

Traditional college students came from more affluent families, were generally the

top students in their high schools and had superior scores on their college entrance exams. Institutions of higher education prior to the 1960s and 1970s were primarily designed for the male Caucasian aged 18-22 years (Hisada, 1988). Community colleges were designed for a more diverse student population. The diversity of the national community college population encompasses: 46% of all African American students enrolled in American higher education institutions, 55% of all Hispanic students; 46% of all Asian/Pacific Islander students; and 55% of all Native American students. Nationally, the average age of a community college student is 29 (American Association of Community Colleges, 1999). This diversity necessitates the examination of a multitude of variables that may impact singularly, or in combination, the educational success of college students. Anderson (1999) stated that an examination of the following areas are important when confronting the diversity of the community college population: Social/human relations skills and characteristics, learning styles, task completion skills, psychological characteristics and information processing skills. The nature and characteristics of the community college student population has changed the scope of research in retention.

Terminology Related to Retention and Attrition

Operational definitions used in research vary depending on the type of study conducted and the personal preference of the researcher. Terms that are prevalent in the literature and which do not necessarily have a consistent meaning are discussed in this section.

Panos and Austin, in a 1965 longitudinal study of student attrition, used the term dropout to refer to those students who failed to complete four years of study in a

traditional four-year college time frame. Nondropout, by definition, was any student who entered in the fall of 1961, had completed four years of education, but had not graduated by the summer of 1965. Rossmann and Kirk (1970) in a one-year study of attrition, used the following terms: (a) persisters, for those students who completed three consecutive quarters of college; (b) withdrawals, for those students who left campus after three quarters with GPAs of 2.00 or above; (c) failures, for those students who left campus with GPAs of less than 2.00 after three quarters; and (d) withdrawal-returnees, for students in good standing who withdrew during the academic year but later returned to school. Astin (1975) used the term stopout to describe students who interrupt their education for a relatively brief term and eventually return to complete their degree. Notice the similarity in connotation between Astin's term, stopout, and Rossmann and Kirk's withdrawal-returnee.

Hackman and Dysinger (1970) used the terms transfers/returnees for those students who withdrew from one institution and transferred to another or re-enrolled at the same school later. The term academic dismissal was used to identify students forced to leave school because of poor academic performance. Gerdes and Mallinckrodt (1994) in a longitudinal retention study, identified persisters as those students who had graduated within six years of initial enrollment. They used the term leavers for those students who had left school without finishing a degree within the six-year time frame. Bonham and Luckie (1993), in a community college retention study, used the terms nonreturnee for those students who failed to enroll for a subsequent term or transferred to another institution; dropout for those students who failed to meet their educational goals and no longer planned to work towards those goals, and stopout for nonreturnees who had not

accomplished an educational goal, but who stated that they intended to accomplish that goal either at the original institution or another. They also introduced the term optout for a nonreturnee who had accomplished an educational goal but who opted out of further study related to that goal. An example of this would be the individual who had completed a one-year certificate in electronics but did not want to pursue an associates degree in electronics.

The purpose in reviewing the variety of definitions used in retention research is to illustrate the changing nature of students in their pursuit of educational goals, the variety of ways institutions of higher education view retention and the use of different terminology to describe educational success or failure. As indicated by Panos and Astin in their 1968 study, a student would have been considered an educational failure simply because he or she did not complete a certain amount of college work within the traditional four-year period of time. By the same token, Gerdes and Mallinckrodt (1994) considered students educationally successful if they completed a degree within a six-year period of time. Although the terms "leavers, dropouts, nonreturnees, optouts" connote academic failure, they do not necessarily mean the same thing as academic dismissal. These definitions have been created in response to research that has revealed a variety of reasons why students leave college, (Panos & Astin, 1968; Astin, 1971; Tinto 1975, 1987, 1988; Langley, 1987; Brooks-Leonard, 1991). The evolution of terms used to describe stages of student passage toward educational goals has changed with the times.

Legitimate educational goals have also changed. Traditionally, the only legitimate measure of educational success for an individual student in a four-year institution was the completion of a baccalaureate degree. Community college educational

success was defined as completion of an associates degree or transfer to a four-year institution and eventual completion of a baccalaureate degree. The definition of educational success has changed, as well as the time frame involved. Community colleges confer nearly two hundred thousand one-and two-year certificates to students each year (American Association of Community Colleges, 1999). These certificates represent educational success for those students, whether they take one year to complete or four. As the evolution of research in retention continues, new definitions describing student success and failure will necessarily be created. The variety of definitions used by researchers, however, may contribute to the inconsistencies of research findings.

Factors Related to Retention and Attrition: Four-Year Perspective

Early researchers focused primarily on cognitive and demographic factors in studies of retention at four-year institutions. Traditionally, such cognitive factors as high school GPA, college SAT scores and class rank received the most attention. These factors were studied in conjunction with such demographic factors as sex, age, socioeconomic status, ethnicity and marital status. As the student population in higher education became more diverse, other factors termed noncognitive i.e. social, and psychological in nature along with external factors such as college environment emerged. These factors, combined with cognitive and demographic factors, enhanced the ability of researchers to explain the variance in student retention.

Pickering, Calliotte and McAuliffe, in a 1992 study of first year freshmen, found that the inclusion of noncognitive variables added to the prediction of both student academic difficulty and academic success at the end of the freshman year, and attrition/retention into the second year. Anderson (1999) found that, historically,

cognitive variables explain approximately 15 to 20 percent of the variance in student persistence. Tinto (1987) reported the number as approximating 10 to 15 percent. The remaining 80 to 85 percent of the variance in student persistence must necessarily lie in the noncognitive domain. The findings of Anderson (1999) and Tinto (1987) were consistent with those of Panos and Astin (1968). Students' responses to a mailed questionnaire indicated a variety of reasons for leaving college including: (a) changed career plans, (b) dissatisfied with college environment, (c) scholarship terminated, (d) wanted time to consider interests and goals, (e) marriage, (f) pregnancy, (g) tired of being a student, (h) could not afford cost, (i) academic record unsatisfactory, and (j) drafted.

The top reasons given for leaving college were: (a) changed career plans, (b) dissatisfaction with college environment, (c) wanted time to consider interests and goals, and (d) not being able to afford the cost. Dissatisfaction with the college environment was the top reason given, a factor addressed by Tinto's conceptual model of dropouts from higher education (Tinto, 1975, 1987, 1993). Poor academic performance accounted for only 15.5 percent of males' and 5.8 percent of females' reasons for leaving college. This supported Anderson's and Tinto's estimates of the percentage of student persistence explained by cognitive factors. Other factors identified as indicators of poor persistence were primarily demographic in nature and included: (a) relatively low socioeconomic background, (b) relatively low high school grades, (c) being a member of an ethnic minority, and (d) being married.

Panos' and Astin's study also examined environmental factors linked to student attrition. Two patterns of environmental factors were noted. One was concerned with interpersonal relationships, including competitiveness, risk-taking, informal dating,

limited opportunities for involvement with the instructors, and other extracurricular activities that tend to enhance student involvement at the college. Today, these might be grouped as noncognitive or social factors. The second environmental factor was administratively determined and included severe grading practices, a faculty that is not concerned with the individual student and a generally permissive attitude in regards to student selection of courses, drinking and cheating. These patterns were not a major conclusion of their study, only a suggestion of a relationship, but foreshadowed the results of future research. However, this study was one of the earliest that included cognitive, noncognitive, demographic and environmental factors. It merits noting because of its age, variables examined and relevance to the study of retention today.

Gerdes and Mallinckrodt (1994) identified and examined three broad areas thought to impact college attrition. They labeled these areas academic adjustment, social adjustment and personal or emotional adjustment. They found that students overestimated their ability to adjust academically and socially to college, and underestimated their ability to make a personal/emotional adjustment. In summary, they stated that: "We believe the findings of this study support the contention that personal adjustment and integration into the social fabric of campus life play a role at least as important as academic factors in student retention" (p. 286).

Towns (1997) reported on a Georgia study conducted by the Council for School Performance which found that financial assistance had a positive impact on student retention. The study examined the impact of the Hope Scholarship on student retention and found: (a) students who receive a Hope Scholarship are more likely to stay in college, (b) Hope students are likely to be female and white, and (c) Hope students at the state's

two-year colleges have slightly higher grade point averages than their peers at four-year institutions. Rossmann and Kirk (1970) found political climate had an impact on retention. Specifically, they found that males were more likely to withdraw if they became active in student protest movements such as supporting civil rights and opposing the war in Viet Nam. Competition for grades was a factor in female withdrawal. Female students in the study were more likely to withdraw if they expressed displeasure about competing for grades. No differences were found in persisters and withdrawals, male and female alike, in the following areas: (a) family income, (b) father's or mother's education or occupation, or (c) parents' level of aspiration for child. This was in contrast to much of the previous research and may have been due in part to the collegiate political and social climate of the time.

Hackman and Dysinger (1970) identified two dimensions related to whether students stay in college or dropout. They called the two dimensions "academic competence" and "college commitment." Persisters tended to be talented and committed. Non-persisters tended to be either high in academic competence with moderately low commitment who tended to withdraw but re-enrolled later, or poor in academic competence, moderately high in commitment with a tendency to persist in college until poor academic performance forced them to leave.

Tinto (1987) identified the primary reasons for student withdrawal from institutions of higher education. There are two levels, individual and institutional. On the individual level he states that:

> The two attributes that stand out as primary roots of
>
> departure are described by the terms intention and commitment.

> Each refers to important personal dispositions with which individuals enter institutions of higher education. These not only help set boundaries of individual attainment but also serve to color the character of individual experiences, within the institutions following entry. On the institutional level, for the four terms of individual experience which affect departure we use the terms adjustment, difficulty, incongruence and isolation. Each describes an important interactional outcome arising from individual experiences within the institution. (p. 39)

Tinto notes that the majority of student departures are voluntary in nature. He suggests that this results from what goes on after entry into the institution rather than what may have occurred beforehand. This contradicts the early study of Panos and Astin (1968) that found individual factors prior to attending college played a more important role in attrition than environmental factors prevalent after entry into an institution of higher education.

Liu and Liu (1999) applied Tinto's model of student departure at a commuter college and found, as did Panos and Astin, individual factors of race and age to be related to low retention rates. The study also found that type of student (transfer in this case) had a higher retention rate than native freshmen. Tinto however, was supported by Earl (1986) in a study at an urban university, who found that academic failure was not predictable and occurred randomly among all freshmen without regard to gender, race, high school location or admission criteria. According to Earl, "The implication is clear that non-persisters randomly include students of all academic backgrounds and potential"

(p. 89). Earl's findings suggested that the experiences of students after they enter an institution had a greater impact on retention, as Tinto suggested. Institutional and individual impact on commitment, as related to academic and social integration, continues to be studied in two-year and four-year institutions.

Factors Related to Retention and Attrition: Two-Year Perspective

The study of factors related to retention and attrition in two-year institutions had not been as prevalent in the literature in the 1960s and 1970s, but gained momentum in the 1980s and 1990s as the role of community colleges evolved in educating a more diverse segment of the population. High attrition is characteristic of students in the community college setting (Astin, 1975; VCCS, 1998). Nationally, the average age of a community college student is twenty-nine years (AACC, 1999). The profile of the typical community college student, a person who has a full or part-time job, lives off campus, and is taking classes on a full or part-time basis, makes retention a particular concern for community colleges (Bonham & Luckie, 1993). Tinto (1994) pointed out that most community college students are older and generally poorer than four-year students, and have multiple obligations outside of school, such as careers, families and volunteer work, that greatly limit the time and energy they can devote to college studies.

The increased emphasis from the two-year perspective begins in the early eighties with a review of studies that have a community college focus (Gates & Creamer,1984), and culminates with a meta-analysis of Tinto's model of student persistence as applied to the community college setting (Napoli & Wortman, 1996). Gates and Creamer, in a 1984 longitudinal study, examined seven pre-enrollment characteristics: (a) race, (b) sex, (c) ability, (d) socioeconomic status (SES), (e) high school grades, (f) high school program,

and (g) educational aspirations as predictive of student persistence. Their study also included three student-institutional characteristics: (a) entry status, (direct - enrollment immediately following high school graduation or delayed - enrollment one or more years following high school graduation) (b) enrollment status (full or part-time), and (c) curricular type (students choosing an academic or vocational program of studies) to determine institutional impact on student retention.

The inclusion of vocational students by the researchers in this study was of significance. The labeling of students as academic or vocational has changed over the years. The term vocational has often been associated with negative connotations of students pursuing education and training in the skilled occupation areas. The title technician has replaced such terms as mechanic or repairman. The terms occupational/technical or applied science majors are more prevalent and are increasingly used in place of the term vocational in today's community college vernacular. Today, students majoring in these areas (both in certificate and associate degree programs) make up a significant portion of the community college population. The results of this study revealed that: (a) vocational students were more likely to persist than academic students, (b) black students were more likely to persist than white students, (c) delayed entry students were more likely to persist than direct entry, (d) students with good high school grades were more likely to persist than students with poor high school grades, and (e) full-time students were more likely to persist than part-time students. When using pre-enrollment variables only, the study was able to explain only 4.3% of the variation in retention status. When the remaining variables of entry status, enrollment status, and curricular type were added, the explanatory power of the study only increased to 8.1%.

This left approximately 92% of the variance in retention status unexplained. Gates and Creamer concluded: "It appears from this study that determinants of retention/attrition are not merely shaped by the kinds of students enrolled in two-year colleges, but are influenced by institutional conditions, such as programs, policies, organizational patterns, and an interactive climate, after student matriculation" (p. 47).

Grosset (1989) applied Tinto's (1975) model of student departure to a community college setting. This model was based on two primary factors that impact retention and attrition: personal characteristics of the individual student and the interaction of that student with the college. Grosset found a positive correlation between student characteristics, college experience, and persistence. She suggested using Tinto's model as an appropriate guideline for institutional assessment efforts. However, she did not suggest that Tinto's model was appropriate for all institutions. Colleges need to develop their own models appropriate to their own situations.

Fishbach (1990) conducted a longitudinal study designed to examine pre- and post-enrollment variables as predictors of student persistence and to compare persistence between vocational and academic program community college students. Like the Gates and Creamer (1984) study, the inclusion of the vocational (applied science students in this study) cohort was used. Applied Science majors generally pursue a terminal degree or certificate to gain specific job-related skills in order to gain an entry-level position in the trade and technical fields. The populations from which random samples were selected included first-time, full time, degree seeking students in the fall of 1987. This population consisted of 656 Applied Science students and 671 Arts and Sciences students. The vocational cohort in this study comprised almost fifty percent of the total student

population.

Fishbach, in contrast to Gates and Creamer, found no difference in the persistence rates between vocational and academic program students. Pre-enrollment variables including: age, race, gender, high school (HS) percentile, American College Testing (ACT) program scores and intent were used to predict student persistence. These variables accounted for only 25% of the variance in community college student persistence, with HS percentile contributing 19% of that total and age contributing another 5%. These variables predicted a larger percentage of the variance in persistence (25%), as compared to Gates and Creamer (4.3%). Post-enrollment factors that were significant in predicting persistence included GPA and withdrawal (defined as formal withdrawal from one or more courses). Using stepwise regression analysis the two variables taken together were able to contribute 43% to the prediction of community college student persistence, as compared to 8.1% contribution of the pre and post-enrollment variables in the Gates and Creamer study. The average age of students in this community college study was 20.7 years, comparable to a four-year institution, with 80% of all students under 21. This is well under the national average of 29 years, (AACC,1999). The average age of these students is not representative of the general community college student population. The ability to generalize these results to other community college settings due to the age factor alone, may be limited.

Daniels (1990) administered an Entering Student Survey to students in the fall of 1988. This instrument was used to gather information about students' goals, expectations and personal situations. This study posited the question, "Do all students really want to earn a college degree?" Daniels states, that "Students have goals which can include

intellectual, career, personal development, or family related elements" (p. 3), all of which impact their motivation and ability to persist in the pursuit of their college goals.

The survey identified three "major reason" responses for leaving: (a) students intending to transfer to another college, (b) students who were career oriented and were pursuing job-related courses or terminal associates degrees, and (c) students taking personal interest courses and not aspiring to go past the associates degree level. This study confirmed that community college students have a variety of goals in mind when they attend a community college. Analysis of variance revealed that students' goals and intentions significantly affected retention. Coll and VonBeggern (1991) defined student goal attainment as students satisfactorily meeting the educational goals they want to accomplish at college.

Bonham and Luckie (1993) conducted a post hoc analysis of retention and attrition in a study of community college non-returnees during the 1990-91 school year. Three types of non-returnees were identified and defined. The dropout was defined as a non-returnee who had not accomplished an educational goal and stated specifically that he/she no longer planned to work toward that goal. Stopout was defined as a non-returnee who had not accomplished an educational goal and stated specifically that he/she still intended to accomplish that goal, either at the present college or elsewhere. Optout was a non-returnee whose educational goal was met and opted out of further study related to that goal. Bonham and Luckie posited that retention and non-retention be defined in more than one way. Individuals and the institution should accept non-retention as success if individuals accomplish their educational goals. They conducted telephone interviews of non-returnees using a survey instrument developed and pilot-tested and

obtained 399 usable interviews. The results of the survey indicated that approximately 3% of those interviewed were classified as true dropouts, between 4.2% and 20.1% could be considered optouts (65 non-returnees gave inconsistent answers later in the interview) and 75.9% of those interviewed considered themselves stopouts. Assuming a majority of these stopouts eventually complete their educational goals the implications of this pilot study are important. Attrition, at least in this setting, may be overstated. Traditional methods of calculating retention and attrition rates at community colleges should be examined. It may be that community colleges are doing a better job of serving their customers, if only viewed from a short-term retention perspective.

Brooks-Leonard (1991) conducted a study of retention between first and second term students. The researcher examined demographic and academic factors associated with student retention. This study departed from the more traditional studies that are longitudinal in nature (Gates and Creamer, 1984; Fischbach, 1990) by using a term to term time frame. Longitudinal studies generally use year to year measurements. Demographic variables related to retention were educational objective (supported by Daniels, 1990), full-time or part-time status, employment status and age. The only academic variable positively correlated with retention was first term GPA. Two-way ANOVA revealed no significant interactions between any of the previously mentioned demographic variables and first term GPA. They identified five groups towards which retention efforts should be directed. They were: (a) students taking courses only, (b) students enrolled part-time, (c) students employed full-time, (d) students over the age of 40, and (e) students whose first term GPA is less than 1.00. This study included the demographic variables of enrollment status in combination with employment status.

Such a combination of external variables had not been examined in prior studies. As many community college students are older and have responsibilities outside of school (McCartan, 1988; Bonham & Luckie, 1990; Tinto, 1994) these variables merit further examination as to their impact on student retention and attrition in a community college setting.

Fralick (1993) conducted a telephone survey of one thousand randomly selected students who enrolled for the fall semester of 1990 but did not enroll for the spring semester of 1991. The college in the study had experienced an attrition rate of 55% (fall to spring semesters) that is high, even for community colleges. The study also examined enrollment status and employment status, variables previously examined by Brooks-Leonard (1991). Fralick, used the terms positive attrition for those students who made progress toward achieving their goals or successfully completed the classes in which they were enrolled during the semester and negative attrition for those students who were not successful in making progress towards their goals and did not successfully complete their classes.

The results of the survey indicated that 78% of the students considered themselves to be successful and were placed in the category of positive attrition. The remaining 22% were not successful and were placed in the negative attrition category. Some of the reasons given for not returning the next semester are as follows: 25% achieved their goals, 7% used skills learned in college to obtain or advance employment, 6% transferred and took classes for personal interest and 10% completed the class. The survey showed 82% of all non-returning students worked while attending college and of those 72% worked full-time. Twenty-three percent of the non-returning students left school because

of employment. Other reasons indicated for not returning included: academic problems 1%, personal problems 4%, financial problems 2%, health 3%, child-care 5%, and lack of transportation or motivation 12%. A comparison of the characteristics showed that unsuccessful students were significantly more likely ($p < .05$) to have academic, personal, financial, health and child-care problems than successful students. The study found no significant differences related to college persistence in two areas: gender and ethnicity. It was also noted that the majority of attrition at the college (62%) occurred early in the first semester. The relevance of this study, as in Brooks-Leonard (1991), lies in the fact that employment status, as well as other noncognitive factors such as transportation and childcare, merit further study as factors in retention and attrition at the community college level.

Feldman (1993) like Gates & Creamer, (1984); and Fishbach, (1990), examined pre-enrollment variables as predictors of one-year retention for first-time students at Niagara Community College. A logistic regression model was used to select predictors of retention. The results indicated that a lower high school GPA, age range 20-24, attending part-time and being an ethnic minority other than Asian were all associated with a greater degree of attrition. The ethnicity results contrasted with Fralick (1993) who found that ethnicity was not a significant factor in retention. Fralick (1993) and Brooks-Leonard's, (1991) findings were consistent with those of Feldman (1993), indicating that enrollment status, in combination with employment status, was a factor in predicting retention. GPA was a predictor of retention and was consistently found to be a significant factor in retention of college students (Panos & Astin, 1968; Gates & Creamer, 1984; Brooks-Leonard, 1991).

Head (1989) examined institutional and student characteristics of community college students at a community college in Southwest Virginia to determine if differences existed between returning and non-returning students. Retention rate in this study was defined as the percentage of students enrolled during one semester that re-enroll and complete the subsequent term. The retention period used in this study was similar to Bonham and Luckie (1993) who also used a term to term time period with which to examine post hoc differences. The study of retention and attrition using a shorter time frame is frequently utilized when studying the two-year institutions.

Head examined full-time students and found no gender difference in retention. However, retention rates for full-time white students was higher than for full-time black students. Age was found to be a factor correlated with the retention of full-time students, with students 25 and over being retained at a slightly higher rate than younger students. Retention rates in curricular programs were also compared. Retention rates for students in Associate of Arts and Sciences were slightly higher than students enrolled in Associate of Applied Science, 85.2% to 82.9% respectively. The curricular results differed from Fishbach (1990) who found no differences in the retention rates of students majoring in Arts and Science versus Applied Science. Feldman found students aged 20-24 to pose a higher attrition risk, which conflicts with Head's (1989) findings. Feldman (1993), however, supports the findings by Head (1989) that ethnicity is a differentiating factor for predicting retention among community college students.

Mohammadi (1994) conducted a longitudinal study at a community college in Virginia in which he examined three "clusters" of predictor variables. These were : demographic variables (gender, age, and ethnic background); academic achievement

variables (overall GPA, first semester GPA, hours completed, hours per semester, enrollment status of students and curriculum of study); and academic variables (freshman, sophomore, developmental, and unclassified). Students were either classified as persisters or leavers. The findings were consistent with those of Daniels (1990) and Brooks-Leonard (1991) indicating that students' goals were a strong predictor of retention. The findings also indicated that hours enrolled per semester, number of credit hours completed, current GPA, and overall GPA were significant predictors of retention. Attrition rates were higher for female students, black students, part-time students and those in the age ranges of 23-35 and 45-50. Mohammadi's findings in regard to older students conflict with Head's (1989) findings that students over 25 are at a lower less risk of attrition. Head (1989) and Feldman (1993) support the retention difference by ethnicity. The gender difference is not supported by Head (1989) or Fralick (1993).

Romano (1995), in a study at a community college in upstate New York, used multiple regression analysis to identify those variables that might be used to predict attrition after the first semester of study and to identify early leavers - students who did not complete their first semester of enrollment. The study included 1,454 full- and part-time students enrolled for the first time who filled out an Entering Student Survey. The dependent variable was retention, defined as those students in the sample who entered in the fall semester and returned in the spring of 1991 as either full- or part-time students.

The survey generated 132 variables to which were added 21 post-enrollment variables on each student, all of which were used as independent variables. Stepwise multiple regression was used and only seven of the variables were significant at the .05 level. The study found that variables related to academic performance had the highest

correlation with retention which is supported by Brooks-Leonard, (1991) and Mohammadi (1994). Students who were not retained were most likely to be receiving financial aid, to have high school averages of C or less, to be enrolled in non-transfer programs (technologies and health services), to be less certain of their career choice, to be on academic probation, and to have low expectations about their future schooling. Using discriminant analysis the study was able to classify 60.8% of the early leavers correctly as to whether they would be retained or not. According to the author, using discriminant analysis to develop a profile of high-risk students before they start classes is a promising method of inquiry.

Glass and Garrett (1995) investigated the relationship between completion of an orientation course by new community college students, higher retention rates, and grade point average (GPA). The study used only full-time students (registered for 12 or more credit hours). The study used a control and an experimental group matched to control for the effect of extraneous variables, with the experimental group taking the orientation course. Retention was operationally defined as total credit hours completed, and GPA was the cumulative GPA both calculated after 1 year of continuous enrollment or at the time the student withdrew, whichever came first. The results, using analysis of variance (ANOVA) at an .05 level of significance, indicated that students who successfully completed the orientation course had a significantly greater number of credit hours earned after one year and higher GPAs than students who did not take the course.

Glass and Garrett concluded that completion of an orientation course during the first term of enrollment appeared to promote the retention and improve the grades of community college students. Orientation classes are designed to intentionally create

interactions between the freshman and the college community and thus facilitate the academic and social integration of the first semester community college student. The results of this study support Tinto's (1987) proposition that retention could be improved by increasing the student's integration into the academic and social systems of the college or college life.

Parker (1998) reported on a New York State Education Department study of minority students enrolled in its two-year college professional technical programs. The study's purpose was to determine the extent to which programs and/or services exist to facilitate the persistence and retention of minority students. The study found seven primary barriers affecting the retention of minority students that supported Tinto's model of student retention regarding the importance of social and academic integration. The barriers identified were: (a) job and family responsibilities, (b) location of colleges outside minority concentrations, (c) lack of minority faculty and administrative staff, (d) lack of college funds for intervention programs, (e) inability to afford college, (f) lack of appropriate social and cultural activities, and (g) and unsupportive surrounding communities.

Sydow and Sandel (1998) conducted a study to determine the reasons for the unusually high rate of student attrition at a southwestern Virginia community college. The college had a first-to-second-year dropout rate of 50% and a similarly high fall-to-spring semester dropout rate. The findings indicated that gender, age and work/family were correlates of attrition. More females than males withdrew from classes. This data was in contrast with Feldman (1993) who concluded that females were more likely to persist than males. Age was a factor, as older students aged 20-34, were 1.77 times more

likely to dropout than students 19 or younger. This conclusion supported Feldman's findings of age as a retention factor. The most predominant factors cited as reasons for student attrition were work and family. This was similar to one of the retention factors (job and family responsibilities) cited by Parker (1998).

Burgess and Samuels (1999) studied the impact of instructor status on student retention and academic performance in sequential courses at a large multi-campus urban community college. Burgess and Samuels noted a national trend toward the increasing use of part-time instructors in the community colleges. They addressed the question of whether the students taught by part-timers were as successful as those taught by full-timers. Their null hypothesis was that there was no difference in the success of students taught by part-time versus those taught by full-time instructors.

The study involved students taking courses in sequential developmental mathematics, regular mathematics, and regular freshman English courses. There were four possible instructor status combinations: (1) both courses are taught by full-time instructors; (2) both courses are taught by part-time instructors; (3) the first course is taught by a full-time instructor, and the second course by a part-time instructor; and (4) the first course is taught by a part-time instructor and the second course by a full-time instructor. The dependent variables were: (a) number of students achieving a grade of "C" or better and (b) number of students completing the course. There were significant differences based on instructor status between the number of students completing the second course, and passing the second course with a grade "C" or better. The null hypothesis based on the data from the study was rejected. The results suggested for a majority of the students in the study that part-time instructors under prepared their

students for subsequent courses taught by full-time instructors. Students in sequential courses whose initial course was taught by a full-time instructor were better prepared for their subsequent course, whether it was taught by a full-time instructor or a part-time instructor. Instructor status is another factor to be considered in the retention and academic success of community college students.

Napoli and Wortman (1996) conducted a meta-analysis of Tinto's model of student retention, focusing on the model as applied specifically to the community college setting. Their stated goal was to assess the impact and relative importance of social and academic integration on the persistence and withdrawal behavior of community college students. Six studies were generated from a computer search that met the criteria of assessing the impact of academic and social integration on persistence among community college students. All six of these studies reported significant positive correlations between academic integration and persistence. Four out of the six studies found a significant and positive relationship between social integration and persistence. The results of the meta-analysis supported Tinto's (1987,1993) findings for academic integration and social integration. Napoli and Wortman believed that a comprehensive study of factors related to persistence and attrition among community college students should examine both academic and social integration.

Mohammadi (1994) argued for more of the known variables to be considered in the creation of a model for studying attrition. Napoli and Wortman (1996) lent support to Mohammadi's position by arguing for the inclusion of academic and social integration factors in the construction of such a model. No pattern of consistent correlations with the factors examined, other than GPA, has clearly been determined.

Models of Retention

Institutional change directed toward increasing retention is best planned using an information base developed within a sound theoretical framework and derived through the use of valid and reliable collection and analysis procedures (Hisada, 1988). Hisada stated that a preliminary step in retention research is the adoption of a theoretical framework or model of student departure. Various models of student departure exist in the literature (Astin, 1970; Spady, 1970; Tinto, 1975, 1987; Creamer, 1980; Pascarella & Terenzini, 1983; Bean and Metzner, 1985; Duncan, 1985; Shelton, Stevens & Mecca, 1995). Pascarella and Terenzini (1991) label these as "college impact models." Tinto's (1975) theoretical model of dropouts, however, has been one of the most utilized.

Tinto argued that the process of dropout (student departure) from college could be viewed as a longitudinal process of interactions between the individual and the academic and social systems of the college. Tinto's model is dynamic in nature and has been adapted for use in both two-and four-year settings over the past three decades. While the validity of Tinto's model has been established across institutional types (four-year, two-year and commuter institutions), the variables having the greatest influence on persistence vary with the type of institution (Hisada, 1988). This dynamic model of student departure continues to be in use today. Its validity and predictive power are still relevant to the study of student retention and attrition and serve as a template for current and future research.

Astin (1985), as cited in Pascarella and Terenzini (1991), proposed a theory of involvement as a model to help explain student development. Astin stated his theory simply, "Students learn by becoming involved" (p. 50). According to Astin, the student

plays a central role in determining the extent and nature of growth according to the quality of effort or involvement with the resources provided by the institution.

Spady (1970) developed a model of student departure positing that grade performance, normative congruence (shared group values) and friendship support lead to increased integration into the academic and social environment of the college. Spady, like Tinto (1975, 1987), viewed student persistence as a longitudinal process. Spady's and Astin's models were more descriptive in nature, whereas Tinto's model was more predictive. Tinto expanded on Spady's initial concepts of student departure by developing a more comprehensive model and adding (in addition to the previously mentioned academic and social integration process), external factors, that included: family background, individual attributes and pre-college schooling. Tinto also noted institutional characteristics that impacted student departure including institution type e.g., public, private, four-year, two-year, institution size and composition. These internal and external variables examined together could be used to measure the degree of individual goal achievement and institutional commitment and thus predict student persistence.

A reconceptualization and validation of Tinto's model was presented by Pascarella and Chapman (1983). The model was validated when institutions (four-year residential, four-year commuter and two-year commuter) were grouped together. However, when the model was applied to institutional settings separately, the results did not support the model. Social integration was negatively correlated with persistence at a commuter college, indicating that social integration was not as important to the persistence of commuter college students. This study contradicts Napoli and Wortman's (1996) meta-analysis which concluded (at least for public commuter community

colleges), that there was a positive relationship between social integration and persistence. Pascarella, Duby and Iverson (1983) added a second variable, intent to persist or leave, to Tinto's reconceptualized model and found that intention was a good predictor of persistence. Bean and Metzner (1985) presented a model of nontraditional student attrition that examined variables related to intent to leave as studied by Pascarella, Duby, and Iverson, (1983). They posited that background, academic and environmental variables were the most important factors related to nontraditional students and their intent to leave.

Horton (1980) proposed an integrative model as an adaptive framework for action and used it in the community college setting in an attempt to, "coalesce the fragments of researched knowledge into systematic program implementation" (p. 3). He adapted an organizational model proposed by Selfridge and Sokolik, as cited in Horton (1980). Their model encompassed twelve levels of intervention that feature much of the areas of research pertaining to retention and included: (a) organizational structure, modified as necessary to reduce bureaucratic barriers to students; (b) policies, designed with flexibility of interpretation for students; (c) environment, which encourages student participation and interaction with faculty and staff; (d) class placement using accurate assessment of student academic background and cognitive styles; (e) instructional strategies based on the fact that students learn differently and a positive learning environment can play a role in retention; (f) advising system, which is effective in helping students develop goals which research has shown to impact retention; (g) customer relations, understanding that the student is the customer and that faculty and staff are essential to providing a good "staying" environment; (h) out-of-class contact,

with faculty members, (i) interest of class presentations, how course material is presented by faculty; (j) intellectual stimulation; and (k) psychological accessibility, genuinely caring about the students point of view. Horton suggested that these levels of intervention be used in organizing a holistic approach to the problems of student attrition.

Creamer (1980) advocated an Advising for Retention Model in which he posits seven propositions related to retention: (a) retention begins with recruitment; (b) educational advisement of high quality leads to increased student retention; (c) the quality of student faculty interaction is a major contribution variable to institutional holding power; (d) the best single indication of the likelihood of persistence in college is grades; (e) the premier goal of educational advising is the full integration of students into their campus environments; (f) educational advising programs should be designed to provide accurate, consistent, accessible information to students concerning their progress within a specific environmental context; and (g) educational advising programs should be developmental in nature.

According to Creamer, "The seven propositions, taken together, represent the basis for synthesis of the literature to be able to state simply what should be done" (p. 15). Utilizing these propositions, Creamer formulates an Advising for Retention Model that has four components: (a) recruit ethically, (b) orient honestly, (c) inform continuously, and (d) advise developmentally. The segment of this model that may not be applicable to a community college setting would be recruit ethically, as most two-year institutions have an open door policy and do not recruit specific segments of the population.

Creamer (1980) and Horton (1980) provided examples of models that were prescriptive in nature. The models suggested a process to be followed to enhance college student retention. The models were also comprehensive in that they included a broad spectrum of factors to be examined. The models have not been subjected to validation studies and remain theoretical. The following two models may be described as examples of "working models" of student retention on the community college level.

Shelton, Stevens and Mecca (1995) developed a "functional model" for calculating student retention at South Carolina's Piedmont Technical College (PTC). Their framework for constructing such a model adapted Steven R. Covey's Seven Habits of Highly Effective People, as cited in Shelton, Stevens and Mecca (1995). It includes: (a) be proactive - take initiative and responsibility, (b) begin with the end in mind - Leadership begins with clear goals, (c) put first things first-manage yourself, prioritize your goals, and manage your time, (d) think win-win - seek mutual benefit, (e) seek first to understand, then be understood - communication, (f) synergize - cooperation and teamwork, and (g) sharpen the saw - renewal.

The model was based on PTC's definition of retention as "a series of levels at which students and the college persist and work to fulfill goals" (p. 3). Their model identified four categories of students as: (a) continuing student - eligible to return and does so during the next sequential term, (b) reinstated student - student previously enrolled but had left for one or more terms prior to registering for classes, (c) transfer students - new to PTC but had previously been enrolled at a different institution and (d) first timers - a student whose initial college experience began at PTC.

One of the goals of this model was to develop the ability to measure college

versus program retention. Program retention was viewed as positive in the sense that students changed program of study but remained enrolled at the college, but negative in the sense that they were no longer in their original program of study. One of the benefits of this model was its ability to assess individual program productivity. The question of "why" students transfer from one program to another could be addressed. This model illustrated the uniqueness of the problems in examining retention and attrition in a community college.

Duncan (1985) in contrast with Shelton, Stevens and Mecca (1995), developed multiple models for student retention programs at the Community College of Denver (CCD). Instead of a single institutional model, this researcher developed four separate and distinct models. Duncan, suggested a separate model for each category of student defined as follows: (a) students with undeclared majors/unclear goals, (b) students who are academically unprepared, (c) new students to college, and (d) returning adults. Each model used different retention activities depending on the category. For example, academically underprepared students would complete basic and vocational skills assessment, be enrolled in an Academic Survival Skills course, be identified by an early detection system at the first sign of academic difficulty, be assigned to a staff and peer advisor and meet on a regular basis. Returning adults would be given special orientation geared toward working and evening students, attend special workshops on self-esteem, studying with younger students etc., be assigned a peer mentor, and be given career assistance. The researchers concluded that retention efforts should be multi-faceted and tailored to specific needs of identifiable groups within the general population.

The "working models" developed by Shelton, Stevens and Mecca, (1995) and

Duncan (1985) present practical approaches to student retention at community colleges. As the research suggests, there is no one single descriptive, predictive, prescriptive or working model that can be applied to all situations. These models recognize the complexity of factors involved in helping students achieve their individual educational goals. Recent research reinforces a need for a paradigm shift in thinking about community college student expectations (Illinois Community College Board, 1995). The diversity of the community college population and the students' expectations of what a community college can offer them in achieving their goals present opportunities to those institutions who can recognize, design and implement comprehensive dynamic models that can meet the students at the door and help them succeed.

Retention Strategies and Programs

Models examined previously have provided a conceptual, theoretical and practical framework for studying student retention and attrition. The continuing evolution of work in this area has spawned the development of strategies and programs with which to attack the problems of student departure. As might be expected, the individual institutional setting and composition of the student body necessitate the development of a variety of approaches to the problem. This section focuses on more recent strategies and programs developed in various community college and four-year settings.

Opp and Colby (1986) identified several retention efforts designed to meet the needs of at-risk students that they identify as: low-income, academically underprepared, students with unclear academic and career goals, and reentry students. Opp and Colby concluded that college retention efforts should focus on areas such as academic stimulation and assistance, personal future building and out-of-class faculty interaction.

They make a case for mandatory activities that should include: (a) mandatory testing and placement, (b) orientation programs, and (c) peer instruction and integrated support services.

Frost (1991) suggested that academic advising should be examined as a means of enhancing the positive outcomes of college. This researcher stated that "Colleges and universities could use strategic planning to design advising programs based on relationships of shared responsibility and focused on students' success" (p. 1). This shared responsibility not only includes advisor and student, but also includes administrators and faculty. The study suggested that designing advising programs tailored to students' individual needs could be essential to increasing student involvement. This approach was similar to Duncan's (1985) four-model design.

Beatty-Guenter (1994) developed a typology of retention strategies aimed at providing an understanding of the relationship between various retention strategies in the literature, what they have in common and how this understanding can be applied in practice and research. She organized the strategies into four types, which are labeled according to purpose. These are: (a) sorting students into groups, (b) connecting students to the institution, (c) supporting students in meeting their living needs, and (d) transforming students and/or the institution.

According to Beatty-Guenter (1994), sorting and supporting strategies are reactive in nature, addressing issues presented by the diversity of the student population; connecting strategies are interactive, targeting increased interaction between the student and the institution; and transforming strategies are proactive, effecting changes in students and the institution in order to improve retention. Examples of specific strategies

within each group would include: Sorting - entry assessment and placement, early warning; supporting - child care, financial aid; connecting - student activities, student groups, peer programs, faculty/student events; and transforming - learning assistance, tutoring, goal and career counseling, instructor development programs. The researcher believed that these strategies needed to be part of an institution's comprehensive retention program with elements of each strategy included. This typology of strategies supports Astin's (1975) theory of student involvement and Tinto's (1975,1987) theory of academic and social integration.

Lewallen (1993) established two early alert pilot projects at Antelope Valley College. One project focused on students taking basic skills courses and the other focused on students across the curriculum. The purpose of the study was to develop a system for the early detection of students in academic difficulty. Early intervention is a concept that has attracted much attention in the study of student retention (Earl, 1986; Tinto 1987). The idea is to get the institution involved early in a student's academic career before trouble begins. Research suggests that early intervention can have a positive impact on retention. "Early" was defined in this study as within the first three to five weeks of the semester. The first project developed an Early Advantage Referral Form to be filled out by the instructor at the first sign of academic trouble. The second project developed a Student Self-Assessment of Academic Progress. Both were designed to give feedback so that intervention could take place at the first signs of trouble. Student feedback was a novel concept designed to give students a chance to rate themselves as to their progress. Only thirty-two Early Advantage Referral Forms were initiated. The results were inconclusive due to the small sample size. A total of 1,160 students filled

out the Student Self-Assessment Form during the fourth week of the fall term.

In most cases, student self-assessment was found not to be an accurate predictor of student progress. Only 11% of students surveyed indicated that they were not doing well. However, 37% of the students surveyed received D, F, NC, or W grades. While the results were inconclusive, of the 11% who indicated that they were doing poorly, the top four reasons given for not doing well were: (a) don't have time to study 67%, (b) study, but do poorly on tests 63%; (c) can't tell what is important 54%, and (d) test anxiety 48%. Students indicated that work and family obligations were the top reasons for not having time to study. Students who indicated that they were doing "OK" cited good academic preparation and good study/learning skills as the major reasons for their success. The results of this study were inconclusive, but student feedback revealed areas of concern which impact student success.

Tinto and Russo (1994) studied the effects of a Coordinated Studies Program (CSP) on student retention at Seattle Central Community College. According to these authors, CSP's are organized around a central theme that links courses and faculty from different disciplines and fields. The courses were typically "team-taught" by two to four instructors. Course activities included: small group and whole class discussions, seminars, group projects, field trips, lectures, guest speakers and films. Emphasis was given to cross-disciplinary topics, team-teaching and collaborative learning and student involvement in the construction of class knowledge. Students reported being more involved in course-related activities, in activities with other students, more connected with faculty, more experienced with the use of the library and more involved with arts activities on campus. They also reported being more involved in campus activities.

Persistence as measured by re-enrollment from fall to spring semester, was 83.8% of first-year students participating in the CSP, compared with 80.9% of first-year students not participating in a CSP. The results of persistence from spring to the following fall semester indicated 66.7% of CSP students re-enrolled in the fall compared to 52% of students not enrolled in the CSP. Tinto and Russo concluded that it is possible to promote student involvement and achievement in a community college setting and that collaborative learning works. They stated: "This research suggests that attaining the goals of enhanced student involvement and achievement is possible only when institutions move to alter the settings in which students are asked to learn" (p. 24).

Brawer (1996) suggested specific intervention strategies including: orientation programs, mentoring programs and multiple strategies. While not as specific as Beatty-Guenter (1994), the idea was to tailor each of these strategies to the particular student cohorts. The research suggested that these strategies were among the most widely used and have been successful in student retention.

Wilson, Mason and Ewing (1997) evaluated the impact of university-based counseling services on student retention by examining counseling records of students who had requested counseling services. The sample consisted of 562 students who had requested counseling for personal concerns. The participants were divided into four groups for the study according to how many counseling sessions they had received: (a) participants who had requested services but not received them, i.e. did not show up for appointments, (b) students who received 1-7 counseling sessions, (c) students who received 8-12 counseling sessions, and (d) students who received 13 or more sessions. A chi-square analysis was used with an alpha level of .05 and found a strong linear trend in

which increases in the number of counseling sessions attended resulted in increases in the likelihood of being retained. Specifically, the retention rate of students who requested but did not receive counseling was 65%. Students who had received 1-7 sessions of counseling had a retention rate of 79%, a 14% advantage. The authors concluded that counseling centers should be a part of any program evaluation effort as it relates to student retention.

Baron (1997) examined the Bronx Community College Freshman Year Initiative Program (FYIP). The program's primary goal was to provide a comprehensive academic and counseling program designed to enhance academic achievement for a select group of first-semester students who require at least three remedial courses. Many community colleges are faced with a high percentage of their student populations requiring one or more remedial (the term developmental is also used) courses. Approximately 84% of all Bronx Community College students require such courses. There were five components: (a) creation of the freshman outreach, caring, understanding, and support (FOCUS) center, a holistic counseling center, (b) psycho-educational testing, (c) peer counseling and tutoring, (d) a rapid contact counseling program to provide immediate contact with absent and problem students, and (e) a revised orientation and career development course that included self-concept development and problem solving/coping skills. This program contained strategies similar to Lewallen (1993) and Beatty-Guenter (1994). The author found that 76.5% of FYIP participants continued enrollment from the fall of their first year to the next compared to 59.3% of non-participants. The results also indicated that the students participating in the FYIP did better in terms of grades as compared to non-participants. This study, like Tinto and Russo's (1994), involved a collaborative effort

on the part of faculty, counselors and the institution with positive results.

Studies designed to "predict" potential dropouts have also been conducted in the two-year and four-year realm (Dallas, 1971; Astin 1975; Pascarella and Chapman, 1983; Pickering, Calliotte and McAuliffe, 1992; Jeffreys, 1998). Dallas (1971) reported on one of the earliest comprehensive projects, which focused on retention and attrition of community college students. The Northern California Cooperative Research Project (NORCAL) was a quasi-longitudinal study which involved twenty-three participating community colleges. The project had three phases, each of which took one academic year to complete. The project was quasi-longitudinal in nature because while each phase took one academic year the time frame for studying student dropouts was one academic semester. Phase I goals were the description and identification of characteristics associated with attrition among community college (Junior College in this study) students. The goal of Phase II was the development of a predictive model to identify the attrition prone students. The last phase of the program included the development and testing of experimental programs to have an impact on reducing the rate of attrition.

Phase II of the project developed and administered a 112 item questionnaire administered to 28,000 first semester freshmen. There were 1436 dropouts and their responses to the questionnaire were compared to a random sample of 1436 students who persisted; differences in responses were compared. The findings indicated that race, marital status, employment status, SES, physically or psychologically distant from parents' home, less likely to have parental encouragement for college, has a lower sense of importance of college and likely to have lower educational aspirations than the persister, were factors identified with potential dropouts.

Discriminant analysis revealed that only 9% of the variance in student attrition was explained by the variables in the study. When students in the model were grouped by ability and sex, seven out of ten could be correctly identified as persisters or dropouts. Phase III of the project involved using the NORCAL questionnaire at one of the community colleges to identify potential dropouts. These potential dropouts were then randomly selected and assigned to either an experimental or control group. The experimental group was given personal help and counseling, in contrast to the control group which received no such help, which resulted in significantly increasing the persistence of the experimental group.

Jeffreys (1998), in a descriptive study of associate degree nursing students at an urban commuter public college, examined the relation of self-efficacy and select academic and environmental variables on academic achievement and retention. The study used the Bean and Metzner (1985) conceptual model of nontraditional undergraduate student attrition as the underlying framework for the study. A second goal of the study was to determine the degree to which the above variables predicted academic achievement and retention.

The operational definition of nontraditional student in this study was: (1) 25 years of age or older, (2) male, (3) English as a second language, (4) ethnic or racial minority, (5) had dependent children, and (6) held a general equivalency diploma (GED). Ninety-seven out of 142 nontraditional students completed questionnaires that contained demographic items, measures of self-efficacy and student perceptions of academic and environmental variables. The findings, using linear regression analyses, revealed that the independent variables of self-efficacy, select academic variables and select environmental

variables accounted for 38% of the variance in academic achievement and 25% of the variance in retention. Prediction of academic achievement alone showed statistical significance at the .01 alpha level.

The implications of this study were that students perceived environmental variables, in particular family responsibilities and family crises, as more influential for academic achievement and retention than academic variables. The results also indicated that at-risk students were those "supremely" efficacious persons who overestimated their academic supports and underestimated their need for preparation. The results of these predictive studies reveal, like other more recent studies included in this review, the significance of demographic, social, psychological and environmental factors to retention and attrition. The ability of institutions to improve their efforts to identify factors related to retention, identify potential dropouts, develop models and design interventions to enhance student retention will enable two year institutions to help students achieve their educational goals.

Summary

The review of literature reveals some promising programs and strategies that merit further study. Researchers have used different time frames and different definitions to study student retention and attrition. Many factors have been examined to determine the reasons why students persist or drop out when pursuing their educational goals, with inconsistent results. It is necessary when focusing on community college students to use a term to term time frame rather than a longitudinal perspective. The attrition and retention behavior of community college students who pursue educational goals that may be achieved in as little as one or two semesters would be misconstrued if examined from a

longitudinal perspective. Retention and attrition definitions pertaining to students in two-year institutions should be standardized. Research in the prediction of potential dropouts and interventions designed to help those students before they encounter trouble shows promise.

CHAPTER III

METHODOLOGY

Introduction

The goal of the proposed research in this study was to adapt and validate an existing survey instrument designed to identify noncognitive factors that could be used to predict potential student retention and attrition. The survey instrument also identified noncognitive factors that could be used to predict student academic success and difficulty. The survey instrument has been validated at the four-year level at a mid-Atlantic urban university and is part of the university's assessment process. This chapter describes the purpose of the study, the setting in which the study takes place, sampling, the research design, instrumentation, data collection, statistical analysis and summary.

Purpose

The review of the literature reveals that there are a variety of factors that are associated with student retention and attrition. Cognitive, demographic and noncognitive factors have been identified in various studies as having a positive or negative impact on student success or failure in reaching their educational goals. The increasing diversity of the student population in higher education has confounded the ability of researchers to develop a consistent theoretical or practical typology of reasons for student success or failure in higher education. The purpose of this study was to successfully identify those students who may have difficulty in navigating their first semester in a community college setting. It is hoped that successful validation of the results of the Freshman Survey at the two-year level will enhance the ability of two-year institutions of higher education to design early interventions for those students who need assistance in meeting

their educational goals.

Setting

The study was conducted at a two-year public community college that is one of a twenty-three-member community college system of higher education located in Virginia. The subjects used in this study were first semester curricular freshmen. The institution is small in size, with an average entering freshman class of two hundred full-time students. The survey instrument was administered to the entire class of first semester curricular freshmen that totaled 174 students. One could argue that the composition of incoming freshmen in a community college setting is random by nature because most two-year institutions have an open door admissions policy. All students who applied were accepted, regardless of cognitive, demographic or non-cognitive characteristics and thus are out of control of the experimenter and the college. Unlike most four-year institutions, no parameters are established, such as high school rank or SAT scores, as a precursor to admission. There is one exception to be noted. Students who apply to the college who do not have a high school diploma or general equivalency diploma (GED) and wish to apply for federal financial assistance (PELL GRANT), must take an Ability to Benefit Test.

Research Design

The study used a non-experimental, cross-sectional, correlational design to examine a cohort of first semester curricular freshmen using self-reported data. A non-experimental design was appropriate as there was no manipulation of variables. A cross-sectional design was appropriate as the data were collected at a single point in time. A correlational design was appropriate as the study investigated the predictive validity of an existing instrument. Correlational designs help to clarify relationships and patterns of

relationship among variables (Ary, Jacobs and Razavieh, 1996). Correlational designs are appropriate where variables are very complex (e.g. construct variables) and/or do not lend themselves to the experimental method and controlled manipulation (Isaac and Michael, 1990). An advantage of a non-experimental design, compared to an experimental design, is that this type of design uses a real world setting. Educational settings are generally not conducive to experimental designs because of the difficulty of controlling all relevant variables. Non-experimental designs are more prevalent, e.g. causal comparative and correlational in educational settings.

Threats to validity in a correlational design would include: subject characteristics, instrumentation, implementation and population validity. Subject characteristic threats would include: selection of subjects for the study, age, sex, individual history, and maturation. Instrumentation threats would refer to the reliability and validity of the instrument used to gather data. Validity refers to the extent to which an instrument measures what it is intended to measure. Reliability refers to the consistency of an instrument in measuring whatever it measures (Ary, Jacobs and Razavieh, 1996). Implementation would involve specific procedures used in conducting the study. Population validity and ecological validity may be obtained by using a real world population and setting. Population validity refers to the ability to generalize to a larger population, e.g. larger freshman classes at other community colleges. Ecological validity refers to the ability to achieve similar results in other settings, e.g. other community colleges. Generalizability can be achieved, depending on the operational definitions of the population being studied, e.g. first semester community college freshmen and the realness of the setting in which study takes place, e.g. new student orientation sessions in

a community college and/or individual classrooms if necessary. Experimental designs take place in artificial settings and the results may not be generalizable to other people, places and environments unless the exact conditions under which the experiment was originally conducted can be duplicated. The disadvantage of non-experimental designs, compared to experimental designs, is that the internal and external validity associated with them may be low (Campbell and Stanley, 1963).

Sampling

Sampling error is a major concern of any study. Problems with sampling could lead to the commission of a Type I error (rejecting a true null hypothesis) or Type II error (failing to reject a false null hypothesis). Administering the survey to an entire curricular freshman population reduced much of the sampling error in this study. The advantage of undertaking an instrument validation study at a small institution is that it allowed a greater degree of control over the conditions in which the survey was administered. The researcher was present during the orientation and classroom sessions to explain the purpose of the survey, obtain consent, assure confidentiality and clarify any questions that students asked during the completion of the survey instrument. The presence of the researcher to answer questions as they arose facilitated accurate completion of the instruments. Clarifications of questions were also illustrated on the blackboard.

Population Profile

The profile of a typical Virginia Community College student has relevance in determining the generalizability of the results of survey administered to the freshmen student population at the two-year study site. The following student profiles (Table 1) serve as a general comparison of the VCCS population to the two-year study site student

population (VCCS, 2000),

Table 1

VCCS Population Statistics

	VCCS	STUDY SITE
Average Age	31	30
Enrollment (Full-time)	28%	29%
Enrollment (Part-time)	72%	71%
High School Graduates Enrolling in Fall	10%	12%
Employed While Enrolled	68%	65%
Students Taking Developmental Courses	16%	17%
Gender - Male	41%	31%
- Female	59%	69%
Ethnicity - White	70%	67%
- Minority	30%	33%
Students Receiving Financial Aid	17%	30%

As seen, there are many similarities between the survey population and the VCCS population. Some of the notable differences would be in the areas of financial aid received and gender composition. The literature review found inconsistent results in examining financial aid and gender as predictors of academic performance and retention/attrition.

Instrumentation

The goal of this study was to determine whether noncognitive variables could be identified and used to predict academic difficulty and attrition in a two-year setting by establishing the predictive validity of the use of the Freshman Survey. Predictive validity concerns using an instrument to estimate some criterion behavior that is external to the measuring instrument itself (Nunnally, Berstein, 1994). The instrument used in this study was originally designed and validated for use in an urban four-year university setting. Pickering, Calliotte and McAuliffe (1992), developed an instrument to identify and measure the noncognitive predictors of (a) academic difficulty or academic success, and (b) attrition or retention. The literature review has shown that as much as 85% of predictors or factors related to student success in reaching their educational goals lies in the noncognitive arena.

The survey consisted of 143 items arranged in a Likert-type response format. The advantage of using a Likert Scale is that the scales are simpler to construct and several studies have found that they are somewhat more reliable (Ary, Jacobs and Razavieh, 1996). The following areas are covered: (a) reasons for attending college, (b) reasons for choosing this university, (c) number of hours spent per week in a variety of activities during the senior year of high school, (d) frequency of occurrence of a number of academically and socially-related experiences during the senior year in high school, (e) self-ratings of various abilities and traits compared to peers, and (f) predictions with regard to the occurrence of certain academic, extracurricular, work-related and social situations in the freshman year. A scoring method was developed to produce probation scores and attrition scores. Permission to use the survey was obtained from Dr. Calliotte

and Dr. Pickering. The survey was normed for the community college population. This involved an examination of the questions in each of the sections as to the appropriateness for the community college population. Modifications of questions were necessary, as some of the questions as originally stated pertain more to students in a four-year setting. Examples of modifications are: (a) Question 100 - Complete a Bachelor's degree at the four-year institution, was changed to complete a certificate or Associate's degree at the two-year institution, (b) Question 127 - Join a fraternity or sorority, was changed to join a club. The researcher and the coordinator of student services of the two-year institution under study reviewed the changes and presented the modified survey to Dr. Calliotte and Dr. Pickering who reviewed the changes for appropriateness and applicability to the community college population.

Data Collection

Approval to administer the survey during new student orientation or classroom settings was obtained from the Dean of Students and President of the two-year community college. Permission to conduct the study and administer the survey was also obtained from the Human Subjects Review Committee at Old Dominion University. Students were advised of the voluntary nature of their participation in the study and were asked to sign an informed consent document (appendix A) as part of their participation. The Freshman survey was directly administered to the students at the beginning of orientation and classroom sessions. Individual classrooms were used, as orientation classes did not include all first semester curricular freshmen. Attendance at orientation was voluntary on the part of students, which necessitated administering the survey in individual classrooms during the first two weeks of the semester. A copy of the

Freshman Survey is included in the appendix (Appendix B). An adequate response rate is an important means of precluding response bias. The main advantage of a directly administered questionnaire is the high response rate which typically approaches 100 percent (Ary, Jacobs & Razavieh, 1996). The researcher was present during the administration of the survey, explained the purpose of the survey, gave assurances of confidentiality, answered questions and obtained consent. This facilitated proper completion of the instrument. A 90 percent response rate was obtained.

New and returning students could enroll and register for classes through the end of the first week of classes. To capture additional late registrants, the researcher made arrangements with the student counselors and the registrar to identify and contact those individuals. Individual arrangements were made to administer the survey at a convenient place and time suitable to the students. This effort improved the overall response rate although several students opted not to volunteer for the survey.

Statistical Analysis

The criterion variables of interest in this study were qualitative in nature. The goal was to use the results of the survey to predict "membership" into two different categories of criterion variables. The first category used to classify students was academic difficulty or academic success. Academic success was defined in the original study (McCauliffe, Calliotte and Pickering, 1992), as a GPA at the end of the first semester of 2.00 or above, academic difficulty was defined as a GPA of below 2.00. The second category was the classification of students into retained or not retained. The original study also defined retention as student re-enrollment in the spring semester and not retained was defined as students who did not re-enroll in the spring semester. The

time frame for this study was modified and defined as fall term to spring term.

When the criterion variable(s) of interest are of a qualitative nature an appropriate statistical technique to use is discriminant analysis. Discriminant analysis is a procedure for identifying relationships between qualitative criterion variables and quantitative predictor variables (Kachigan, 1986). The criterion variable of interest can be dichotomous, as in the case of this study, or multi-valued. Group membership is mutually exclusive; membership in one group precludes membership in another group, e.g. one can either be male or female but not both. Predictor variables to be used are dictated by the nature of the criterion variable under investigation. This study investigated the validity of an instrument using Likert scales to score attitudinal and belief statements along with demographic and cognitive characteristics believed to be related to student membership in one of two dichotomous criterion groups, i.e. retained or not and academic success or difficulty. According to Kachigan, "We will want to measure our objects on those variables which we believe to be related to the objects membership in one or another of the criterion groups"(Kachigan, 1986, p. 360).

Determination of accuracy of the prediction of the discriminant function on the two criterion variables of interest was measured by the construction of a confusion matrix for each criterion variable. A confusion matrix presents a tabulation of the object's actual group membership with its predicted group membership (Kachigan, 1986). To collect the information necessary to construct such a matrix, freshman grades were examined at the end of the fall term to determine actual academic success and academic difficulty versus predicted academic success and academic difficulty. Enrollment of second semester freshmen was examined at the beginning of the spring term to determine

actual attrition and retention versus predicted attrition and retention. Pickering, Calliotte and McAuliffe (1992) found that a combination of cognitive and non-cognitive predictors worked best for predicting academic difficulty/academic success. A combination of cognitive, demographic and noncognitive predictors worked best for predicting attrition/retention. Overall the largest contribution to the predictions of academic performance and retention/attrition was attributed to noncognitive factors. It was anticipated that validation of the use of the Freshman Survey on the two-year community college level would yield similar results. We find in discriminant analysis ... a fusion of the three key functions of statistical analysis - data reduction, inference and the identification of associations among variables (Kachigan, 1986).

Summary

The methodology followed in this study was anticipated to successfully replicate the findings of the original study, resulting in successful validation of the use of the instrument in a two-year setting. The results of this study can be used to extend the research base of knowledge of student retention and attrition into the two-year community college setting. The high attrition rate of community college students in the first semester continues to be of great concern to two-year institutions. Early prediction and identification of students who may have trouble successfully negotiating the first semester in college is crucial. The successful validation of this instrument as to the early identification of students at risk of poor academic performance or attrition is invaluable to community college counselors, administrators and faculty. This knowledge can be used to improve student success by designing early intervention strategies to assist students in achieving their educational goals.

CHAPTER IV

FINDINGS

Introduction

This chapter provides a brief review of the data collection methodology, the population for the study, and selected demographic characteristics of the respondents. The research questions are then presented for review. The statistical analysis and predictions of academic difficulty and attrition, as revealed by the discriminant functions, are included as well as a comparison results of the data analysis between the original four-year and two-year study. Data were collected during the first two weeks of the fall 1999 and spring 2000 semesters.

Review of Data Collection Methodology

Prior to the administration of the survey a field test was conducted to assess the average length of time taken to complete each survey, and to assess the clarity of directions for each section of the survey. Average completion time for the survey was 30 minutes. The survey was administered during the first two weeks of the fall semester during class time with prior permission of individual instructors and included morning, afternoon and evening classes. The survey was administered during classes that included: English, History, Mathematics, Accounting, Business Management, Information Systems Technology, Electronics, Biology, Sociology and Occupational/Technical classes such as Automotive Technology, Nursing, Welding and Computer Aided Drafting and Design. The surveys were administered at the beginning of the class period. No problems were encountered during the administration of the survey. The researcher was present during the survey and provided clarification as questions arose, and collected the surveys upon

completion. During the first month of the second semester student records were examined to record fall semester academic performance and drop out/ retention status of the volunteers who participated in the study.

Respondents

This study focused on first semester curricular (degree or certificate seeking) students attending a two-year institution for the first time. Non-curricular students and dual enrollment high school seniors were not included in the study. This resulted in a final count of 174 first semester curricular students. Because participation was voluntary, several students opted not to take part in the survey. This resulted in a final total of 156 students who volunteered to fill out the survey. A response rate of 90% was obtained. Three of the surveys were considered unusable and not included in the analysis. Of the 153 volunteers who participated in the study, a total of thirty-five students (23%) were in academic jeopardy at the end of the first semester and a total of thirty-seven students (24.2%) did not re-enroll for the spring semester.

Respondent Demographics

Summary statistics for selected demographic variables are shown in Table 2. The total sample included in the study consisted of 153 students. The mean age of the volunteers was 24.38 years (SD = 9.44) with a range of 18 to 64 years. 24.2% of the subjects were males and 75.8% were females. Fifty percent of the respondents were Caucasian, and 47% African American.

Table 2

Selected Demographics

Category	Range	Mean	Std. Dev.	Frequency	%
age	18-64	24.38	9.44	153	100
gender					
male				37	24.2
female				116	75.8
ethnicity					
Caucasian				77	50.33
African American				72	47.06
Hispanic				3	1.96
American Indian				1	.65

Research Questions

This study sought to answer the following questions using correlational methodologies:

1. Are there noncognitive factors that can be used to predict academic difficulty or success of first semester freshmen at the two-year level?

2. Are there noncognitive factors that can be used to predict attrition or retention of first semester freshmen at the two-year level?

3. What percent of variance in academic performance can be accounted for by

noncognitive factors?

4. What percent of variance in retention/attrition can be accounted for by noncognitive factors?

Statistical Analysis

Discriminant Analysis using SPSS 10.0 for Windows was conducted to determine whether noncognitive factors (attitudes, opinions, self ratings and personal predictions as reported on the Freshman Survey) could predict risk for two dichotomous criterion variables, i.e., academic difficulty/success and attrition/retention. Procedures used in the original study for the calculation of probation and attrition scores were closely followed (Pickering, Calliotte and McAuliffe, 1992). The probation score was derived from an examination of the percentage of freshmen in academic difficulty for responses to each of the 143 questions on the Freshman Survey. An item was included in the probation score if it met one of two criteria: (a) a disproportionate number of students who chose a specific response to the item were in academic difficulty at the end of their first semester. Since 23% of the community college freshmen who completed the survey were determined to be in academic jeopardy at the end of the first semester, an item was included if at least 30% of the students who chose that item were in academic difficulty or, (b) a chi-square analysis of the item indicated a significant difference ($p < .05$) between the percentage in academic difficulty (GPA < 2.00) versus the percentage not in academic difficulty (GPA $\geq$2.00). These criteria yielded a total of 55 items that were included in the probation score. A similar procedure was used to derive the attrition score using attrition /retention at the beginning of the spring semester as the second criterion variable of interest. A total of 24.2% of the community college freshmen who

completed the survey were not retained in the spring semester. The responses to items for the attrition score were included if students who did not return for the spring semester had responses to items on the survey that totaled at least 35%, or if the chi-square analysis revealed a significance ($p < .05$) between the percentage of students retained versus those students not retained. These criteria yielded a total of 41 items for the attrition score.

A separate discriminant analysis was performed on each of the criterion variables (a) academic difficulty (GPA < 2.00) or academic success (GPA $\geq$ 2.00) labeled (PROFSEMB) and (b) attrition or retention labeled (FRESHAT) into the spring semester. Table 3 displays the discriminant function results for academic probation. Probation scores above the mean 8.88, ($SD = 4.72$) displays students who were more likely to be in academic jeopardy at the end of the first semester. The mean score for students in academic difficulty at the end of the first semester was 13.51, compared to a score of mean score of 7.51 for students not in academic jeopardy. Table 4 displays the discriminant function results for attrition. Students with attrition scores above the mean 5.1, ($SD = 2.9$) were more likely to not be retained at the beginning of the spring semester. The mean score for students who dropped out at the end of the first semester was 8.16, compared to a mean score of 4.18 for students retained.

Table 3

Discriminate Function Results for Academic Probation (PROFSEMB)

N	Valid	153	Missing	0

Statistics

Mean	8.8824
Mode	7.00
Std. Deviation	4.7253
Range	27.00
Minimum	1.00
Maximum	28.00

PROFSEMB Scores and Frequencies

		Frequency	%	Valid %	Cumulative %
Valid	1.00	1	.7	.7	.7
	2.00	6	3.9	3.9	4.6
	3.00	9	5.9	5.9	10.5
	4.00	9	5.9	5.9	16.3
	5.00	12	7.8	7.8	24.2
	6.00	13	8.5	8.5	32.7

Table 3 (Continued).

		Frequency	%	Valid %	Cumulative %
Valid	7.00	19	12.4	12.4	45.1
	8.00	14	9.2	9.2	54.2
	9.00	11	7.2	7.2	61.4
	10.00	14	9.2	9.2	70.6
	11.00	8	5.2	5.2	75.8
	12.00	9	5.9	5.9	81.7
	13.00	6	3.9	3.9	85.6
	14.00	2	1.3	1.3	86.9
	15.00	6	3.9	3.9	90.8
	16.00	3	2.0	2.0	92.8
	18.00	5	3.3	3.3	96.1
	19.00	1	.7	.7	96.7
	20.00	3	2.0	2.0	98.7
	4.00	1	.7	.7	99.3
	28.00	1	.7	.7	100.0
	Total	153	100.0	100.0	

Table 4

Discriminate Function Results for Attrition (FRESHAT)

N	Valid	153	Missing	0

Statistics

Mean	5.0850
Mode	3.00
Std. Deviation	2.8882
Range	16.00
Minimum	.00
Maximum	16.00

FRESHAT Scores and Frequencies

	Score	Frequency	%	Valid %	Cumulative %
Valid	.00	1	.7	.7	.7
	1.00	8	5.2	5.2	5.9
	2.00	12	7.8	7.8	13.7
	3.00	32	20.9	20.9	34.6
	4.00	24	15.7	15.7	50.3
	5.00	22	14.4	14.4	64.7

Table 4 (Continued).

Score	Frequency	%	Valid %	Cumulative %
6.00	17	11.1	11.1	75.8
7.00	9	5.9	5.9	81.7
8.00	8	5.2	5.2	86.9
9.00	5	3.3	3.3	90.2
0.00	7	4.6	4.6	94.8
11.00	3	2.0	2.0	96.7
12.00	3	2.0	2.0	98.7
15.00	1	.7	.7	99.3
16.00	1	.7	.7	100.0
Total	153	100.0	100.0	

Prediction of Academic Difficulty

Research Question 1. Are there noncognitive factors that can be used to predict academic difficulty or success of first semester students at the two-year level? The overall Wilks' lambda was significant, $\Lambda = .713$, $X^2 = 50.886$, $p < .001$, indicating that overall the noncognitive predictors discriminated between the two academic groups. Wilks' lambda is a multivariate analysis of variance test statistic that ranges between 0 and 1. A value of 1 indicates no discriminability of groups, whereas lower values indicate greater amounts of discriminability (SPSS Base 10.0 Applications Guide, 1999). The

results for academic difficulty or success are presented in Table 5.

As indicated in Table 5, the overall hit rate for number of cases correctly classified was 79.7% and the number of cases correctly classified as being in academic jeopardy was 37.14%. This compares favorably with the results of the original study that reported hit rates of 82.34% and 31.18% respectively with similar academic difficulty percentages, 22% for the four-year students and 23% for the two-year students.

Table 5

Results of Discriminant Analyses to Classify Freshmen in Academic Jeopardy

	Predicted Group		
Actual Group	GPA < 2.00	GPA ≥ 2.00	Total
GPA < 2.00	13	22	35
GPA ≥ 2.00	9	109	118
	Classification Percentage		
GPA < 2.00	37.1	62.9	100.0
GPA ≥ 2.00	7.6	92.4	100.0

A total of 79.7% of original groups correctly classified.

The overall percentage of cases correctly identified is affected by chance agreements. Kappa (k) is an index that corrects for chance agreements and assesses the

accuracy in prediction of group membership. The index ranges in value from -1 to +1. A value of 1 for Kappa indicates perfect prediction, while a Kappa of 0 indicates chance-level prediction. (Green, Salkind and Akey, 1997). A Kappa of .34 was obtained as indicated in Table 6, resulting in a better than chance-level prediction provided by the probation score.

Table 6

Kappa Results for Probation

	Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Symmetric Measures				
Kappa				
Measure of Agreement	.34	.092	4.37	.000
N of Valid Cases	153			

Research Question 3. What percent of variance in academic performance can be accounted for by noncognitive factors. This study sought to determine the percentage of variation of group membership in academic difficulty that could be explained by the discriminant function. SPSS calculates a Canonical Correlation that measures the association between the discriminant scores and the two groups (SPSS Base 10.00 Applications Guide, 1999). In the case of academic difficulty this value was .536. When the canonical correlation is squared, in this case .2873, it indicates that approximately 29% of the proportion of variance in group membership is accounted for by the

discriminant function.

Prediction of Attrition/Retention

Research Question 2. Are there noncognitive factors that can be used to predict attrition or retention of first semester freshman at the two-year level? The overall Wilks' Lambda was significant Λ .636, X^2 68.22, $p < .001$, indicating that overall, as with academic performance, noncognitive factors also discriminated between the two attrition/retention groups. Table 7 presents the results of the discriminant analysis to classify freshmen as retained or not retained. As revealed in Table 7, the overall hit rate for number of cases correctly classified was 85%, and the number of cases correctly classified drop-outs was 56.8%. A comparison of the hit rates in the original study reveals hit rate of 77.49% and 22.03 respectively. Actual dropouts percentages were 24.2% for the community college population in this study compared with 26% in the original four-year study.

Table 7

Results of Discriminant Analyses to Classify Freshmen as Retained or not Retained

	Predicted Group		
Actual Group	Not Retained	Retained	Total
Not Retained	21	16	37
Retained	7	109	116

Table 7 (Continued).

	Predicted Group		
Actual Group	Not Retained	Retained	Total
	Classification Percentage		
Not Retained	56.8	43.2	100
Retained	6.0	94.0	100

Note. A total of 85% of original grouped cases correctly classified.

Table 8 displays the kappa results for attrition. As seen in Table 8 the kappa is .553 and indicates a moderately accurate prediction provided by attrition score.

Table 8

Kappa Results for Attrition

	Symmetric Measures			
	Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Kappa				
Measurement of Agreement	.553	.082	6.948	.000
N of Valid Cases	153			

Research Question 4. What percent of variance in retention/attrition can be accounted for by noncognitive factors. A canonical correlation of .604 was achieved in the determination of the percentage of variation of group membership for retention/attrition. Squaring the canonical correlation resulted in a value of .3648. This indicates that approximately 36 percent of proportion of variance is accounted for by the discriminant function. The percent of variance explained as a result of the discriminant function were comparatively better for attrition/retention than for academic performance. This may be due to the fact that there are fewer noncognitive variables included in the probation score for attrition/retention versus academic performance. More variables may introduce distortion into the discriminant function and impact the proportion of variance accounted for.

Comparison of Results

The probation and attrition scores calculated for this study revealed both consistency and differences in the results between the two studies. In the original study, probation and attrition scores produced a consistent overall hit rate in the area of academic performance, 82.34% versus 79.7% in the current study. In the attrition/retention area consistent results were also observed 85% versus 77.49%, respectively. Consistency in the area of specific predictions of the number of actual respondents to be in academic jeopardy at the end of the semester resulted in hit rates of 37.18% in the two-year study versus 31.18% in the four-year study. The only noted difference occurred in the observed hit rates for predicted dropouts with 56.8% in the two-year study versus 22.03% in the four-year study.

The results obtained in this study indicate that the probation and attrition scores

performed better in predicting dropouts than predicting those in academic jeopardy. This is in contrast to the original study that found the probation and attrition scores produced better predictions for those students in academic jeopardy than those who did return to school. It must be noted however, that the original study used a year to year comparison and involved a much larger number of respondents, while the current study uses a more appropriate semester to semester time frame for two-year students. The age of the students in the two-year study may have also been a factor as two-year students tend to be older. The differences in the results are noted here for illustrative purposes only.

This study was able to successfully replicate the Freshman Survey on a two-year level with statistically significant results at the ($p < .001$) level for the population sample studied. The attrition scores achieved a greater degree of prediction for dropouts, 56.8% than the probation scores for academic difficulty, 37.1%. The results for the dropout prediction almost double the prior probability of a student dropping out when compared to the VCCS system wide dropout average of 30% after the first semester. A notable proportion of variance in group membership is explained by each of the discriminant functions for academic jeopardy and attrition/retention, approximately 29% and 36% respectively was obtained.

In summary, the application of the Freshman Survey at the two-year level achieved significant, but different, results for prediction of academic performance versus attrition/retention. A comparison of the results of the two studies revealed that the probation and attrition scores produced similar overall hit rates, but differed in the prediction of academic performance versus attrition/retention. Both studies revealed that

students who produce higher probation and attrition scores are at greater risk of being in academic jeopardy or dropping out of college. A comprehensive elaboration and discussion of findings continues in Chapter V.

CHAPTER V

CONCLUSIONS, IMPLICATIONS, RECOMMENDATIONS

This final chapter includes a summary and discussion of the findings, with implications and recommendations for further research. This study focused on identification and measurement of noncognitive variables that could be used to predict academic difficulty and attrition for community college freshmen using an existing survey instrument developed for use at an urban four-year university, located in the Mid-Atlantic region of the United States. Currently, the Freshman Survey is part of the university's freshman assessment program and has been used effectively to assess and predict academic success/difficulty and attrition/retention with first year students in an urban setting.

The predictive validity for the use of the of the Freshman Survey in a two-year setting was supported by this study. Findings in both the current and original studies were similar. The findings of this study suggest the usefulness of this instrument in a two-year setting. Using a discriminant analysis technique, the study found that there are noncognitive factors that can be identified via the calculation of probation and attrition scores. Individual scores can be used to predict students at risk of academic difficulty or dropping out. The results of this study show promise for use in other community college settings as an early assessment tool for identification of at-risk students.

Introduction

The factors associated with student success have been studied extensively at the four-year level and more recently in the two-year arena. Various approaches have attempted to define specific factors that negatively impact the attainment of educational

goals. From a cognitive standpoint, high school GPA has been consistently identified as a predictor of future academic performance. However, findings from studies examining demographic factors such as ethnicity, socioeconomic status, gender, age, have been inconsistent in predicting academic success and attrition. The literature review has shown that there is a growing trend towards the early identification of at risk students. The results of this study will add to that growing body of knowledge.

Research Questions

The first two research questions ask whether there are noncognitive factors that can be used to predict academic difficulty or success and attrition/retention of first semester students at the two-year level. The results of the discriminant analysis indicated that noncognitive factors via the calculation of a probation score to predict academic difficulty or success and an attrition score to predict attrition/retention successfully discriminated between the two groups and were significant at the ($p < .001$) level. However, the actual identification of individual factors remains elusive. An examination of individual factors that made up each of the probation and attrition scores revealed a total of 19 factors that were included in both scores. For example, many respondents answered that the study institution was not their first choice of colleges to attend. It could be argued that students were disappointed that they were not able to attend their first choice institution. This disappointment could have impacted their first semester's performance. Responses to questions such as the amount of time spent partying, watching television, participating in sports, popularity with the opposite sex and interpersonal skills and commitment to doing well in college were all examples of questions that were included for both scores. To draw inferences on individual responses

to individual questions remains speculative, at best. The survey is not designed to draw inferences on individual responses to individual questions. It appears in this study, as in the original study, that the survey instrument can be successfully used to identify noncognitive factors, that while not individually identified, nevertheless can be used to construct discriminant scores that help to predict students who may be at risk of poor academic performance and attrition.

The remaining two research questions ask how much of the variance in academic difficulty or success and attrition/retention can be accounted for by noncognitive factors. With respect to academic performance, the results indicate that approximately 29% of the variance in group membership is accounted for by the discriminant function. In terms of attrition/retention, 36% of the variance in group membership was accounted for by the discriminant function. The following studies illustrate variations in results using different combinations of predictor variables. In a study of two-year students, Jeffreys (1998) examined variance in academic achievement and retention using academic and environmental variables and was able to account for 38% and 25% respectively of the variance in academic achievement and retention. Fishbach (1990) using pre-enrollment variables such as age, race, and gender accounted for 25% of the variance in attrition/retention of two-year students. In a California study involving two-year students, Dallas (1971) accounted for only 9% of the variance in attrition/retention using a combination of select demographic and noncognitive variables. The findings of this study compare favorably with the results of these previous studies.

Instrument

The validation of this instrument in a two-year setting yielded some consistencies in the areas of scores and somewhat different overall results in the prediction of academic success or difficulty and in the predictions of attrition/retention. Both the original study and the current study revealed that, in general, the higher the probation scores the higher the probability of an individual student being at risk for poor academic performance and dropping out. In contrast to the original study however, the overall hit rates for academic jeopardy were slightly better in the current study, 37.14% versus 31.18% in the original study. The hit rates for attrition/retention from the current study more than doubled the results of the original study, 56.8% versus 22.03% respectively.

There may be several reasons for these variations. The average age of the respondents in the two-year institution was 24.38 whereas that of the four-year study respondents was 18.5. The difference in age of 5.88 years may indicate that maturity could have impacted results. Older students may have a more realistic self-concept and their educational expectations and goals may be more clearly defined. Attitudes and opinions about educational success and failure could be more realistic on the part of the community college population who have been out in the real world a few years as opposed to students straight out of high school. Absolute size of the population and response rate could have an impact. The original study had a response rate of 75%, a total of 1587 out of 2116 first semester freshmen and the current study had a response rate of 90%, a total 156 out of 174 first semester freshmen. Obviously there is a difference in the absolute size of the samples. Ary, Jacobs and Razavieh (1990) indicated that sample size alone ... will not guarantee accuracy. They further stated that, " Other

things being equal, a larger sample is more likely to be a good representative of the population than a smaller sample" (p. 182). Both studies captured a fairly large sample of their respective populations so the variations in results may lie in the diversity of responses related to the attitudes, opinions, and beliefs as expressed by the respondents to the survey.

Probation Scores

When the first discriminant analysis was run on academic performance the original probation score was used. The results were shown to be statistically significant at the $p < .05$ level indicating that noncognitive factors using the original score discriminated between the academic groups. After reviewing the results, in order to minimize the likelihood of bias between two-year and four-year student responses, a new probation score using the responses of the first semester freshmen at the two-year site was calculated. The new probation score was also statistically significant at the $p < .001$ level. The attrition score was calculated using two-year responses and achieved similar statistical significance.

The number of variables included in each of the scores merits discussion. Replicating the selection criteria of the original study, a total of 55 items were included in the probation score (PROFSEMB). Forty-one items were included in the attrition score (FRESHAT) for the current study. The original probation score included 45 items in the probation score and 51 items in the attrition score. There was a difference of ten items for each of the scores. The larger number of items in the probation score resulted in a slightly higher hit rate for academic difficulty, while a lower number of items in the attrition score resulted in a higher hit rate for attrition. These observations are in contrast

to the original study. It remains unclear as to whether the differences in the actual number of items in each score had a significant impact on the hit rates for probation and attrition.

Study Limitations

One of the major methodological concerns with this study, as with most correlational research, is the generalizability of results. The findings of correlational research do not lend themselves to inferring cause and effect relationship between variables. The internal and external validity are comparatively low as compared to experimental or quasi-experimental studies and generalization of the study results to other sites is more problematic. This study used a single site, rural two-year institution, in part, to ensure a contrast between the original study which used an urban four-year setting to establish predictive validity of the Freshman Survey. Two-year institutions tend to serve an older population and the demographics, especially age, may be considerably different. Though the results were consistent with the original study, the current study results are most likely to be generalizable to sites with similar demographic characteristics. To that end, the characteristics of the student population at the two-year site used in the study were generally representative of the population characteristics of the VCCS system. The application of this survey would be appropriate for use in other two-year settings.

Implications for Student Counselors and Advisors

The results of this study have specific implications for student counselors and advisors. The use of the Freshman Survey as a tool to assist counselors and advisors who are on the front line of student services shows promise. Students were asked as part of the survey if they would like to have the results of their scores released to their academic

advisor. A majority (77.7%) answered yes to the question. Students apparently consider this information important enough to warrant sharing with their advisors.

This information could provide additional insight to counselors and advisors in their efforts to successfully advise and guide students through the crucial first semester. Advantages of using a directly administered questionnaire include the strong probability of generating a high response rate, low cost, and the fact that the survey can be administered at the beginning of the semester in orientation classes and regular classes. Students may be curious as to how they compare to other students and how to improve their chances of success in college.

Implications for Administrators

When enrollment is rising at institutions of higher education there is a tendency to diminish the importance of retention efforts. The attention is on the students coming in the front door as opposed to those leaving the institution and failing to achieve their educational goals. Provision of better customer service that enables students (customers) to meet their educational goals is imperative as institutions of higher education face increasing competition for students. It is projected over the next four years that the high school population in the two counties that make up the service area for the two-year institution in this study will decline by five to eleven percent. The rise of distance learning opportunities provides alternative avenues of education for students who live in remote locations that could impact enrollment. In addition Web-based courses are becoming more available as the technology and methods to offer them are gaining in popularity. The traditional pool of potential students is changing as well as the opportunities available for further education. Administrators who have responsibility for

enrollment and graduate production will have to do a better job of retaining the students they do enroll. Use of tools such as the Freshman Survey can help administrators do a better job of improving student academic performance and retention in college.

Implications for Students

Traditional two-year students present special challenges. They are older, have family responsibilities, work part-time or full-time, have been out of school, and are not as academically prepared. These students, as well as students just out of high school, have many obstacles to overcome in order to be successful in reaching their educational goals. They may require more assistance from counselors and advisors to succeed. The results of the study indicate that some of these students can be identified at an early stage in their college career. Armed with information provided by the probation scores and sharing that information with their advisors can hopefully increase their chance of academic success and completion of their educational goals.

Economic Implications

Statistics show that approximately 50% of all four-year and 65% of all two-year students never complete their educational goals. Economic prosperity is at an all time high and overall the nation's standard of living has never been better. However, unless better counseling strategies and tools are developed with regards to retaining and helping students complete their educational goals the economic engine may sputter. Industry has traditionally depended upon the ability of two year and four year institutions of higher education to supply the intellectual capital and skilled workers needed to meet their labor demand. Institutions of higher education must increase productivity to meet the demands of industry. Failure to do so may adversely impact the ability of companies to fill the new

jobs necessary to meet the demands of the market place. Industry has been lobbying Congress to relax immigration quotas in order to import more immigrants with technical skills. Known as the H-1B visa program, foreign workers with technical skills are allowed to stay and work in the United States for six years (Gravely & Roberts, 2000). Jobs are not being filled with domestic workers in part, because of the inability of institutions of higher education to supply the labor demands of industry. Improving the productivity of institutions of higher education is imperative. Failure to do so will force industry to find other sources to supply their labor needs. Any strategy that can be utilized to increase retention and productivity of two-year as well as four-year institutions merits consideration to be included as part of an institutions' strategic plan to attract and keep students.

Recommendations For Further Research

This study provides a small advance in the knowledge base about approaches and strategies addressing the problem of student academic performance and retention of two-year students. Research in the area of early identification of at risk students at the two-year level is becoming more prevalent. This study, using an adaptation of an urban four-year survey instrument, was successfully replicated at a rural two-year institution. Replication is an accepted method of strengthening the results of correlational studies. To that end, the following recommendations for further study are suggested and structured, so as to offer immediate benefits for the current site used in the study and long term benefits for the entire system.

Recommendation 1

The Freshman Survey should be administered to future first semester community college students, beginning fall semester 2001, using the same site as the current study. Early identification of potential at-risk students should be combined with early intervention strategies eg. weekly group counseling sessions, to determine if improvement of academic performance and retention can be positively impacted. Early identification combined with counseling strategies using a control group and experimental group in a quasi-experimental setting could determine the degree of impact.

Recommendation 2

Replication and extension of this study should be accomplished at other rural single site two-year settings. A comparison of similar two-year sights would be useful to see if results were consistent with the current findings. Can similar results be achieved in other rural settings?

Recommendation 3

Replication and extension of this study should be accomplished at multi-campus sites. The current and original studies used a single campus and had access to a large proportion of the population. Would similar and consistent results be achieved with the diversity of a multi-campus institution?

Recommendation 4

Replication and extension of this study should be planned to compare single campus versus multiple campus two-year settings. A single campus setting has a relatively homogenous population. Multiple campuses may have a more heterogenous population due to the diversity of the area that they serve. Can similar results be

achieved?

Recommendation 5

Replication and extension of this study should be planned for rural versus urban two-year settings. This would examine the aspect of size versus geographic location of students in contrasting settings. Would the differences impact the results?

Should these recommendations be followed and successful replication occur in other two-year settings the population and ecological validity of the current study would be strengthened and establish the Freshman Survey as a valid instrument that can be used to enhance counseling strategies and improve customer service at two-year institutions. A logical extension of this study would be to apply this survey to an entire system. The Virginia Community College System contains rural, urban, single as well as multi-campus sites. If early identification and early intervention were applied system-wide, could significant positive results regarding academic performance and retention of two-year students be achieved? The possibilities are intriguing and could help the system improve the educational goal achievement of its students while at the same time improve its ability produce skilled graduates to meet the labor demands of Virginia's industries.

Conclusion

This study involved a small site, moderate sample size and limited scope. However, there are broad research possibilities associated with this study as noted in the recommendations. In the noncognitive arena, factors that impact student academic achievement and attrition are being extensively explored. It is hoped that this research will add to the existing knowledge base and can be replicated with similar results. If the quality of customer service, e.g. improved counseling and/or retention strategies for the

two-year student can be enhanced via the findings of this study, then the research will have achieved its purpose.

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APPENDIX A

INFORMED CONSENT DOCUMENT

TITLE OF RESEARCH: Identification of Noncognitive Factors as Predictors of Freshman

Academic Performance and Retention in a Community College Setting

INVESTIGATOR:

Mark F. Freeze. - Ph.D. Candidate, Darden College of Education. Old Dominion University

Norfolk. VA. 23452. Home: P.O. Box 936, Exmore. VA 23350.

Tel: Home (757) 442-5827. Work (757) 787-5935. E-mail: esfreem @es.cc.va.us.

DESCRIPTION OF RESEARCH: This study is to determine whether there are significant noncognitive factors that can be identified via the administration of a survey designed to assess freshman backgrounds, attitudes, and motivations. Successful identification of significant noncognitive factors that impact freshman academic success and retention can then be used to assist Virginia's community college students in achieving their educational goals. We are asking that you provide your name and social security number as we will be accessing student academic data concerning probationary status as part of the study.

EXCLUSIONARY CRITERIA: To the best of my knowledge. I am not aware of any prior knowledge, experience or physical limitations that would prohibit my participation in this study.

RISKS AND BENEFITS: The survey will require approximately thirty minutes of

classroom time. The identity of persons completing the survey form will be protected. The results of the survey will be reported only on freshmen as a group. There is the risk of breach of confidentiality of sensitive responses and disclosure of social security numbers. These risks are being minimized by separating the opscan sheet responses from the actual questionnaire and by storing the information in a locked file cabinet in a secure room. All precautions will be taken to ensure confidentiality. There are questions on the survey that you may deem to be of a

sensitive nature. If you feel that you are not comfortable answering certain questions you may simply leave them blank. I understand the main benefit to accrue from this study is to give community college counselors, instructors and administration additional knowledge to help community college freshman in achieving their educational goals.

COSTS AND PAYMENTS: I understand that my efforts in this study are voluntary and that I will receive my choice of three different candy bars as a nominal payment for my participation.

CONFIDENTIALITY: I understand that any information obtained about me from this research will be kept strictly confidential. I also understand that the data derived from this study could be used in reports, presentations and publications, but that I will not be individually identified.

WITHDRAWAL PRIVILEGE: I understand that I am free to refuse to participate in this study or to withdraw at any time and that my decision to withdraw will not adversely affect my grade or standing at the college.

VOLUNTARY CONSENT: I certify that I read the preceding sections of this document, or it has been read to me; that I understand the contents; and that any questions I have

pertaining to the research have or will be answered by Mark F. Freeze at (757) 787-5935. If I have any concerns or questions I can also contact Dr. Patricia Pleban, Chair of the University Human Subjects Review Committee, at (757) 683-4085 or the Office of Research, (757) 683-3460. A copy of this informed consent document will be given to me if I desire. My signature below indicates that I have freely agreed to participate in this study.

_____ _____

Student's signature Date

_____ _____

Witness signature Date

INVESTIGATORS STATEMENT: I certify that I have explained to the subject whose signature appears above the nature and purpose of the potential benefits and possible risks associated with participation in this study. I have answered any questions that have been raised by the subject and have encouraged him/her to ask any additional questions during the course of this study.

_____ _____

Investigator's Signature Date

APPENDIX B

EASTERN SHORE COMMUNITY COLLEGE

Freshman Survey

Developed By

James A. Calliotte, PH. D.

J. Worth Pickering. ED. D.

We need your help!! We would like your voluntary participation in our Freshman Survey.

The purpose of the Freshman Survey is to help us to better understand the backgrounds, attitudes, and motivations of our incoming freshman class so that we can provide the kind of assistance needed to support each student's academic success. It is therefore extremely important that you answer the questions on the Freshman Survey as accurately and as honestly possible. We are requesting your name and social security number to enable us to combine this information with other data forms that you have completed for Eastern Shore Community College. Only data on freshman as a group will be reported and your responses will be kept confidential.

Please mark all responses on the survey answers sheets provided, using a No. 2 pencil. Please answer each question and fill in the lettered circle completely! We thank you in advance for your participation.

The survey answer sheets are used because the results can be tabulated using a survey scanner thereby reducing the chance of scoring errors that can occur when surveys are scored by hand.

Deciding to Attend College

The purpose of this section is to determine the reasons you chose to attend college after high school. Please indicate how important each of the following reasons was in your

A. Very Important B. Somewhat Important C. Not Important

1. To be able to get a better job
2. To broaden my perspectives
3. To get away from home
4. To be able to make more money
5. To learn more about things which interest me
6. To attain feelings of accomplishment and self confidence
7. To develop and use my athletic skills
8. To prepare myself for graduate or professional school
9. To participate in college social life
10. To develop interpersonal skills
11. Could not find anything better to do at this time

Choosing Eastern Shore Community College

In this section we are interested in finding out how and why you chose to attend Eastern Shore Community College. Please rate the degree of importance you would attach to

A. Very Important B. Somewhat Important C. Not Important

12. Parents
13. High School counselor or teacher

14. Talking with an admissions representative on campus
15. High school visits by the Admissions Staff
16. Eastern Shore Community College students who are friends or acquaintances
17. Eastern Shore Community College faculty member
18. Eastern Shore Community College recruitment publications
19. Open House/visitation days
20. Eastern Shore Community College's good academic reputation
21. I was offered financial aid
22. Cultural diversity
23. I wanted to live near home
24. Eastern Shore Community College's good social reputation
25. Availability of my chosen major
26. I was not accepted by my higher choice college(s)
27. Eastern Shore Community College's location.
28. Eastern Shore Community College's graduates get good jobs
29. Cost of attending Eastern Shore Community College
30. Opportunity to work part-time
31. My higher choice college(s) did not offer me financial aid
32. Opportunity to participate in athletics
33. The appearance of Eastern Shore Community College's campus
34. Availability of extracurricular activities
35. Availability of other programs
36. Most of my friends chose to attend Eastern Shore Community College

Now, please indicate how frequently you had each of the following experiences during your LAST YEAR in high school according to the following scale.

A. (0 hours) B. (1-5 hours) C. (6-15 hours) D. (16-20 hours) E. (> 20 hours)

37. Studying or doing homework

38. Socializing with friends

39. Talking with teachers outside of class

40. Participating in organized sports

41. Exercising on my own

42. Partying

43. Working for pay

44. Participating in organized clubs and groups

45. Watching TV

46. Doing hobbies

47. Participating in religious activities

In this section we would like to learn more about your experiences during your LAST YEAR in high school. First, how much time did you spend in each of the following

A. Frequently B. Occasionally C. Never

48. Failed to complete a homework assignment on time

49. Drank alcoholic beverages

50. Had difficulty concentrating on assignments

51. Made careless mistakes on tests

52. Felt overwhelmed by all I had to do

53. Was too bored to study

54. Felt depressed

55. What percentage of your close friends in your high school graduating class chose to attend college?

A 0% to 10%

B. 11% to 25%

C. 26% to 50%

D. 51% to 75%

E. 76% to 100%

Abilities and Traits

In this section, we are interested in learning more about how you would rate yourself on various abilities and traits. Please rate yourself on each of the following abilities and traits compared to the average person your age according to the following scale.

A. Top 10%	B. Above Average	C. Average	D. Below Average	E. Lowest 10%

Academic Abilities and Traits

56. General academic ability

57. Mathematical ability

58. Reading comprehension

59. Study skills

60. Time management skills

61. Writing ability

Other Abilities and Traits

62. Drive to achieve

63. Popularity with the opposite sex

64. Leadership ability

65. Physical health

66. Popularity in general

67. Self confidence

68. Interpersonal communication skills

Please rate the extent to which you agree with each of the following statements about being a college student according to the following scale.

Attitudes About Being a College Student

A. Strongly Agree B. Moderately Agree C. Slightly Agree D. Slightly Disagree E. Moderately Disagree E. Strongly Disagree

69. It is important to me to be a good student

70. I expect to work hard at studying in college

71. I am committed to being an active participant in my college studies

72. I will be proud to do well academically in college

73. I admire people who are good students

74. I find studying to be fulfilling

75. I will allow sufficient time for studying in college

76. I see myself continuing my education in some way throughout my entire life

77. I want others to see me as an effective student in college

78. I feel really motivated to be successful in my college career

*Self Descriptions**

Following are a number of statements that reflect various ways in which we can describe ourselves. After reading each statement, one at a time, please answer each item according to the following scale. There are no right or wrong answers, so please make your best judgement. Simply try to rate the extent to which you agree with each statement.

A. Strongly Agree B. Moderately Agree C. Slightly Agree D. Slightly Disagree E. Moderately Disagree F. Strongly Disagree

79. It's hard to find a reason for working

* Items contributed by Dr. Steven Robbins, Virginia Commonwealth University

80. I don't seem to make decisions by myself

81. I have confusion about who I am

82. I have more ideas than energy

83. I lose my sense of direction

84. It's easier for me to start than to finish projects

85. I don't seem to get going on anything important

86. I wonder where my life is headed

87. I don't seem to have the drive to get my work done

88. After awhile I lose sight of my goals

In this section, we are interested in your predictions about how successful you will be in your career at Eastern Shore Community College. Please select the best answer to each question.

89. About 30% of Virginia's Community College students typically leave after the first semester. If this should happen to you, which of the following do you think

would be the **MOST LIKELY** cause?**

1. I am absolutely certain that I will obtain a degree
2. To accept a good job
3. To enter military service
4. It would cost more than my family could afford
5. To get married
6. Disinterested in study
7. Lack of academic ability
8. Inefficient reading or other study skills

** Items contributed by Dr. William Sedlacek, University of Maryland

90. Please check the one description below that you feel best represents your career plans at this time.

A. I have NOT made a career choice at this time and do not feel particularly concerned or worried about it.

B. I have NOT made a career choice and I am concerned about it. I would like to make a decision soon and need some assistance to do so.

C. I have chosen a career and although I have not investigated it or other career alternatives thoroughly, I think I would like it.

D. I have investigated a number of careers and have selected one. I know quite a lot about this career including the kinds of training or education required and the outlook for jobs in the future.

How great are the chances that the following situations will happen to you? Use the following scale.

A. Very Good Chance **B. Some Chance** **C. No Chance**

91. Earn at least a "B" average
92. Study with other students
93. Fail one or more courses
94. Find my courses boring
95. Receive emotional support from my family if I experience problems in college
96. Take more than 2 years to complete my associate degree at Eastern Shore Community College
97. Complete an associate degree or certificate at Eastern Shore Community College
98. If needed, seek assistance for personal, career, or academic problems from the appropriate college office
99. Be placed on academic probation
100. Drop out of college temporarily
101. Drop out of college permanently
102. Transfer to another college at the end of my freshman year
103. Transfer to another college sometime in the future
104. Return for the fall semester of my sophomore year
105. Be satisfied with Eastern Shore Community College
106. Have serious disagreements with my family regarding my personal, social, academic, or career decisions.

Predictions About Your Involvement With Eastern Shore Community College

In this section we are interested in your estimates about how involved you might be in various activities at Eastern Shore Community College in addition to your courses. Use the following scale.
PLEASE USE SECOND ANSWER SHEET BEGINNING WITH QUESTION NO. 110.

A. Never B. Occasionally C. Often D. Very Often

106 Use the library as a place to study and do research for your classes?

107. Talk with faculty informally outside of class?

108. Think about course material outside of class and/or discuss it with other students?

109. Participate in cultural events (art, music, theater) on campus?

111. Use student lounge as a place to eat and/or socialize with friends?

112. Use campus athletic facilities for individual or group recreational activities?

113. Participate in campus clubs and organizations?

114. Read articles or books or have conversations with others on campus that will help you to learn more about yourself?

115. Make friends with students who are different from you (age, race, culture, etc.)?

116. Have serious discussions with students whose beliefs and opinions are different from yours?

117. Use what you learn in classes in your outside life?

118. Actively participate in your classes?

119. How significant a part of your life do you expect your attendance at Eastern Shore Community College to be?

1. Eastern Shore Community College will be the **MAJOR FOCUS** of my life while I am attending.

B. Eastern Shore Community College will receive **MORE ATTENTION**

than the other activities and responsibilities in my life (family, work, friends, etc.)

C. Eastern Shore Community College will receive about the **SAME AMOUNT OF ATTENTION** as the other activities and responsibilities in my life (family, work, friends, etc.).

D. Eastern Shore Community College will receive **LESS ATTENTION** than the other activities and responsibilities in my life (family, work, friends, etc.).

How great are the chances that the following situations will happen to you? **Use the following scale.**

	A. Very Good Chance	**B. Some Chance**	**C. No Chance**
120	Work full-time while attending college		
121	Work part-time while attending college		
122	Attend college part-time for one or more semesters		
123	Do volunteer work		
124	Establish some close friendships with students I meet during my freshman year		
125	Join a fraternity or sorority		
126	Be elected an officer in an organization		
127	Participate in sports		
128	Feel overwhelmed occasionally by all I have to do		
129	Find a job after college in my major field		

130. I would like to have my responses to the Freshman Survey released to my Academic Advisor so that I may compare my answers to those of other freshmen who are academically successful at Eastern Shore Community College.

In this section we would like you to reflect back on your decision to attend Eastern Shore Community College. Please chose the best response to each of the following questions.

A. Yes B. No

131. When it came to choosing among all of the colleges **TO WHICH YOU WERE ACCEPTED**, what choice was Eastern Shore Community College?

A. First choice

B. Second choice

C. Third choice

D. Lower than third choice

132. What was your **PRIMARY REASON** for choosing Eastern Shore Community College? (Please choose only **ONE** reason.)

A. Campus appearance

B. Career Advantage Program

C. Cost

D. Cultural diversity

E. Just felt like a good fit

F. Location near home

G. Quality of academic programs

H. Scholarship or financial aid package

I. Size (number of students)

133. If Eastern Shore Community College was not originally your first choice, which **ONE** of the following colleges was?

A. Eastern Shore Community College was my first choice college

B. College of William and Mary

C. Hampton University

D. James Madison University

E. Norfolk State University

F. University of Virginia

G. Virginia Commonwealth University

H. Virginia Tech

I. Another Virginia college

J. An out-of-state college

When deciding which college to attend, what factors were most important to you?

134. A. Private

B. Public

C Not important to me

135. A. In Virginia

B. Out-of-state

C. Not important to me

136. A. Small (less than 5,000 students)

B. Mid-size (5,000 to 15,000 students)

C. Large (more than 15,000 students)

D. Not important to me

137. A. Rural (outside a city and/or in a small town)

B. Urban (in or near a large city)

C. Not important to me

138. A. Near home (within 30 miles)

B. Away from home (more than 30 miles)

C. Not important to me

139 A. Attractive campus

B. Well maintained buildings

C. Friendly atmosphere

D. More than one of the above

E. Not important to me

140. A. Rural (outside a city and/or small town)

B. Urban (in or near a large city)

C. Not important to me

141. A. Near home (within 30 miles)Away from home (more than 30 miles)

B. Away from home (more than 30 miles)

C. Not important to me

142. A. Attractive Campus

B. Well maintained buildings

C. Friendly atmosphere

D. More than one of the above

E. Not important to me.

APPENDIX C

Probation Score Code (PROFSEMB)

```
COMPUTE PROFSEM=0

IF A5=1 THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF A11=3 THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF B15=3 THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF B35=3 THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF ANY (C37,0,1) THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF ANY (C38,0,4) THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF C41=3 THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF ANY (C42,2,3,4) THEN PROFESM = (PROFSEM + 1)

EXECUTE

IF C43=4 THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF C45=3 THEN PROFSEM = ( PROFSEM + 1)

EXECUTE
```

```
IF D48=3 THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF D49=3 THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF D52=1 THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF D53=3 THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF D54=3 THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF D55=1 THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF ANY (E56,2,3) THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF E58=1 THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF ANY (E59,1,2) THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF ANY (E60,1,2) THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF ANY (E61,1,2) THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF ANY (E62,1,2,3) THEN PROFSEM = (PROFSEM + 1)
```

```
EXECUTE
IF ANY (E63,1,4,5) THEN PROFSEM = (PROFSEM +1)
EXECUTE
IF E64=1 THEN PROFSEM = (PROFSEM + 1)
EXECUTE
IF E65=1 THEN PROFSEM = (PROFSEM + 1)
EXECUTE
IF ANY (F69,1,2,3,4,5) THEN PROFSEM = (PROFSEM + 1)
EXECUTE
IF ANY (F70,1,2,3,4) THEN PROFSEM = (PROFSEM + 1)
EXECUTE
IF ANY (F71,1,2,3,4) THEN PROFSEM = (PROFSEM + 1)
EXECUTE
IF ANY (F72,1,2,3,4,5) THEN PROFSEM = (PROFSEM + 1)
EXECUTE
IF ANY (F73,1,2,3) THEN PROFSEM = (PROFSEM + 1)
EXECUTE
IF ANY (F74,1,2,3,4) THEN PROFSEM = (PROFSEM + 1)
EXECUTE
IF ANY (F76,1,2,3) THEN PROFSEM = (PROFSEM + 1)
EXECUTE
IF ANY (F78,1,2,3) THEN PROFSEM = (PROFSEM + 1)
EXECUTE
```

```
IF ANY (G79,1,3) THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF G80=2 THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF G84=1 THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF ANY (G85,1,2,3) THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF ANY (G87,1,2,3) THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF G88=1 THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF H91=1 THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF H92=3 THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF ANY (H94,1,2) THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF ANY (H96,2,3) THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF H98=1 THEN PROFSEM = (PROFSEM + 1)

EXECUTE

IF H99=3 THEN PROFSEM = (PROFSEM + 1)
```

```
EXECUTE
IF H101=1 THEN PROFSEM = (PROFSEM + 1)
EXECUTE
IF ANY (H102,2,3) THEN PROFSEM = (PROFSEM + 1)
EXECUTE
IF H104=2 THEN PROFSEM = (PROFSEM + 1)
EXECUTE
IF H109=3 THEN PROFSEM = (PROFSEM + 1)
EXECUTE
IF I112=0 THEN PROFSEM = (PROFSEM + 1)
EXECUTE
IF I121=0 THEN PROFSEM = (PROFSEM + 1)
EXECUTE
IF J123=3 THEN PROFSEM = ( PROFSEM + 1)
EXECUTE
IF J127=1 THEN PROFSEM = (PROFSEM + 1)
EXECUTE
IF J128=3 THEN PROFSEM = (PROFSEM + 1)
EXECUTE
IF J130=2 THEN PROFSEM = (PROFSEM + 1)
EXECUTE
IF J131=1 THEN PROFSEM = (PROFSEM + 1)
EXECUTE
```

APPENDIX D

Attrition Score Code- (FRESHAT)

```
COMPUTE FRESHAT=0
IF A1=1 THEN FRESHAT= (FRESHAT + 1)
EXECUTE
IF A10=2 THEN FRESHAT= (FRESHAT + 1)
EXECUTE
IF B26=0 THEN FRESHAT= (FRESHAT + 1)
EXECUTE
IF B31=0 THEN FRESHAT= (FRESHAT + 1)
EXECUTE
IF C39=2 THEN FRESHAT= (FRESHAT + 1)
EXECUTE
IF C40=2 THEN FRESHAT= (FRESHAT + 1)
EXECUTE
IF ANY (C41.0.2) THEN FRESHAT= (FRESHAT + 1)
EXECUTE
IF C42=3 THEN FRESHAT = (FRESHAT + 1)
EXECUTE
IF C45=3 THEN FRESHAT = (FRESHAT + 1)
EXECUTE
IF ANY (C47,0,3) THEN FRESHAT= (FRESHAT + 1)
```

```
EXECUTE
IF D55=1 THEN FRESHAT= (FRESHAT + 1)
EXECUTE
IF E63=0 THEN FRESHAT= (FRESHAT + 1)
EXECUTE
IF E67=0 THEN FRESHAT= (FRESHAT + 1)
EXECUTE
IF E68=3 THEN FRESHAT= (FRESHAT + 1)
EXECUTE
IF F71=2 THEN FRESHAT= (FRESHAT + 1)
EXECUTE
IF F72=1 THEN FRESHAT= (FRESHAT + 1)
EXECUTE
IF F74=3 THEN FRESHAT= (FRESHAT + 1)
EXECUTE
IF F78=1 THEN FRESHAT= (FRESHAT + 1)
EXECUTE
IF G79=2 THEN FRESHAT= (FRESHAT + 1)
EXECUTE
IF G81=2 THEN FRESHAT= (FRESHAT + 1)
EXECUTE
IF G82=3 THEN FRESHAT= (FRESHAT + 1)
EXECUTE
```

```
IF G83=3 THEN FRESHAT= (FRESHAT + 1)

EXECUTE

IF ANY (G84,0,1) THEN FREHSAT= (FRESHAT + 1)

EXECUTE

IF G85=2 THEN FRESHAT= (FRESHSAT + 1)

EXECUTE

IF G86=2 THEN FRESHAT= (FRESHAT + 1)

EXECUTE

IF G88=4 THEN FRESHAT= (FRESHAT + 1)

EXECUTE

IF H90=1 THEN FRESHAT= (FRESHAT + 1)

EXECUTE

IF I92=1 THEN FRESHAT = (FRESHAT + 1)

EXECUTE

IF I96=0 THEN FRESHAT= (FRESHAT + 1)

EXECUTE

IF ANY (I100,1,2) THEN FRESHAT= (FRESHAT + 1)

EXECUTE

IF I109=1 THEN FRESHAT= (FRESHAT + 1)

EXECUTE

IF J111=0 THEN FRESHAT= (FRESHAT + 1)

EXECUTE

IF J115=2 THEN FRESHAT= (FRESHAT + 1)
```

```
EXECUTE

IF J116=3 THEN FRESHAT= (FRESHAT + 1)

EXECUTE

IF ANY (J117.0,3) THEN FRESHAT= (FRESHAT + 1)

EXECUTE

IF J121=1 THEN FRESHAT= (FRESHAT + 1)

EXECUTE

IF K132=1 THEN FRESHAT= (FRESHAT + 1)

EXECUTE
```

VITA

Mark Fallon Freeze was born in Patuxent River, Maryland and was raised on the Eastern Shore of Virginia. He earned a Bachelor of Science Degree in Business Administration from Old Dominion University in 1975 and a Masters Degree in Business Administration from Auburn University in 1976.

He has been on the Faculty of Eastern Shore Community College since 1982 and currently serves as an Associate Professor/Coordinator of Workforce Investment Services. He is a member and past President of the Exmore Rotary Club, a Paul Harris Fellow, past President of the Virginia Employment and Training Association, currently serves as Vice Chairman of the Eastern Shore Family YMCA and member of the metropolitan board of the South Hampton Roads YMCA.

Mr. Freeze lives in Silver Beach, Virginia with his wife Jeanine, daughter Melanie and son Matthew.