The impact of incoming student characteristics and college environment on community college student success

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The impact of incoming student characteristics and college environment on community college student success

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The impact of incoming student characteristics and college environment on community college student success

by

Susan Croy Norton

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CHAPTER I. INTRODUCTION

Student outcomes assessment and institutional accountability are becoming increasingly important in the field of higher education. Federal and state policy makers demand accountability in post-secondary education as funds become more difficult to obtain. State level concern over the quality of post-secondary education has emerged as a national movement. Florida, New Jersey, Georgia, and Tennessee—have initiated extensive state outcomes assessment for students in public institutions; in fact, a majority of the states now have formal initiatives for assessment (Astin, 1991; Doucette & Hughes, 1990).

In 1988 a federal mandate by the Secretary of Education in "Procedures and Criteria for Recognition of Accrediting Agencies" linked assessment and institutional effectiveness to accreditation (Doucette & Hughes, 1990). Consequently, there has been increasing focus on student outcomes and assessment as indicators of institutional effectiveness in community colleges as well as in all other institutions of higher education. What to assess and how to measure effectiveness have become topics of vital importance to post-secondary education, especially to community colleges.

Community Colleges

The report by the League for Innovation in the Community College, "Assessing Institutional Effectiveness in Community Colleges", made the following recommendation for assessing institutional effectiveness at the community college level:
...Assessing the effectiveness of any institution should be based upon a systematic evaluation of how effective it is in performing its explicitly stated missions. Assessment of the institutional effectiveness of a community college, then, is a systematic evaluation of how well such an institution performs not only the mission it has in common with other community colleges but also the missions peculiar to the needs of its local constituents and community. (Doucette & Hughes, 1990, p.1)

In the era of institutional effectiveness and accountability, community colleges are at times criticized for some real or perceived inadequacies in meeting the needs of their students. National dropout rates for two-year public colleges were published as 47.8% in an ACT report in 1989 (Noel & Levitz, 1990). Critics of the community college system sometimes refer to community colleges as having revolving doors rather than open doors. These perceived inadequacies may well be the result of inappropriate measures rather than actual ineffectiveness.

Most of the research that has been done concerning community colleges has focused primarily on retention and persistence. Many of these studies have compared community college data to that of four year colleges or universities, to the detriment of community colleges (Kinnick & Kemper, 1988, Alfred, 1992). The missions of community colleges are, on the whole, far different from the missions of most colleges and universities.

Community college students are a diverse population who are on the whole older, more likely to attend college part-time, more likely to be minority, and have differing goals and reasons for attending college than four-year college students (Voorhees, 1987). Many of them stop out, come for specific skills, have no intention of completing "a prescribed program", or stay just long enough to earn enough money or enough credits to transfer to a four year school (Voorhees, 1987; Daniels,
1990; Adelman, 1992; Alfred, 1992). Using the traditional definition and measurement of retention or persistence with students such as these may not be the most appropriate method of outcome evaluation.

Community colleges were established on the principle that people of all ages, of all races, of all stations in life, and in all geographic regions should have access to post-secondary educational opportunity. Thus, access has become a superordinate mission of community colleges. Assessment of the access mission is concerned with the institutional processes that are necessary to allow for both access and student success (Doucette & Hughes, 1990). Any attempt at institutional effectiveness measure for community colleges should therefore include an evaluation of access and success. This study will focus on one community college's measure of access and student success as a component of an institutional effectiveness process.

North Iowa Area Community College

North Iowa Area Community College (NIACC) is preparing for a North Central Accreditation visit in 1993. In preparation for this visit NIACC instituted a self-study to clarify the mission and goals of the institution; to determine indicators of effectiveness in evaluating progress toward the goals; and to assign responsibility for measuring the indicators and collecting the data. Many indicators and measurement processes were already in place, however, some indicators have not been systematically determined in the past. One goal that has not been comprehensively measured is the institutional goal of access and equity.

NIACC's Access and Equity Goal is to ensure that all citizens of the North Iowa region; regardless of their educational and socio-economic backgrounds,
geographic placement, or needs for special assistance, have the opportunity and the necessary support to successfully take advantage of post-secondary educational programs and other services offered by the college. This study was designed to examine indicators of the effectiveness of the institution in assisting students to be successful through the establishment and use of programs and services as one measure of access and equity.

Programs that attempt to help translate open educational opportunity into meaningful student achievements include: orientation, assessment and testing, academic advising, counseling and support services, academic support and tutoring, campus life (athletics, clubs, cultural activities, student government), career placement, faculty and staff development, and institutional climate. Thus, measures of access and equity include student involvement and satisfaction with various services on campus, as well as student success. One direct measure of access is to examine the diversity of students who attend the college as they compare to the overall population of the communities served by the community college. Following is a profile of NIACC and the students it serves.

Institutional Profile

North Iowa Area Community College (NIACC) is a relatively small rural community college located in north central Iowa. NIACC consists of one main campus (318 acres) located on the outskirts of Mason City, Iowa and four attendance centers located in Charles City, Garner, Hampton, and Lake Mills. The main campus has a dormitory complex which houses 470 students and an apartment building that can accommodate an additional 24 students.
In the fall semester 1991 NIACC experienced a record enrollment of 3,000 students. Of those 3,000 students, 1,019 were first time NIACC enrollees. Seventy-seven percent of the students were residents of the nine-county area served by NIACC. An additional 9 percent of the students came from counties adjacent to the NIACC area. Approximately 3 percent of the students came from out of state. Full time students outnumbered part time students two to one.

The large majority of the students were enrolled in college transfer programs. The number for the fall 1991 programs were 2,156 enrolled in college transfer programs; 293 enrolled in career option programs; and 551 enrolled in vocational programs. These numbers can be misleading since intent to finish a program is not considered when assigning a major; thus, a student enrolling in one automotive class would be counted as an automotive major even if that was the only class he/she ever intended to take. Fifty percent of the students were strictly day students; another 28 percent were enrolled in both day and evening classes; 22 percent took evening classes only.

Gender balance for the entire NIACC student population was 58 percent female and 42 percent male during the fall 1991 semester. Caucasians made up 96 percent of the student population. Ages of the students ranged from 16 to 60+, with the average age of 25. The demographics of the student population for 1991 are fairly typical of the students attending over the past few years.

Student characteristics have an effect on what the mission and purpose of the community college are; and, the mission and purpose of the community college affect which students attend the college. Thus, there is a two-way interaction between institution and student. Documenting the impact of college on students has become
vital to the process of determining institutional effectiveness. A number of models have been developed to facilitate this documentation.

Theoretical Models

Pascarella and Terenzini have recently compiled a review of research published from the late sixties through the eighties pertaining to How College Affects Students (1991). In their book, they review the theories and models of student change. Two general families of theories or models have been developed in the past 25 to 30 years. One addresses the process of student development and human growth; the other focuses more on environmental or sociological impact on students (Pascarella & Terenzini, 1991).

The developmental theories of student change tend to be psychologically oriented and many focus on stage theories which assert that people grow through a number of stages or levels in a hierarchical sequence. Theorists most widely acknowledged for their psychological student development theories include Chickering, Kohlberg, and Perry. The authors note that most of the prominent contributors to theory development have been psychologists (Pascarella & Terenzini, 1991).

Sociological or environmental influence theories of change in college students make up the second general class of theories. These "impact" models concentrate not so much on an internal change process as on the external origins of change. Astin, Pascarella, Tinto, and Weidman are well known sociological model developers (Pascarella & Terenzini, 1991). The sociological models lend themselves to institutional effectiveness studies because they use the impact of the environment
(i.e. the college) as one of their measurement components. Consequently, it was determined that the use of a sociological model would be the most appropriate method to use to examine the institutional effectiveness purpose of access and equity at NIACC. This overview looked briefly at the two general classes of student change models. The following section will examine sociological models in more detail.

The Sociological Model

Alexander Astin proposed one of the earliest college impact models, the now-familiar "input-process-output" model or the input-environment-outcomes model (I-E-O model) (Pascarella & Terenzini, 1991; Astin, 1970). The basic purpose of the I-E-O model is to allow for the correction or adjustment of input differences in order to lessen the bias of comparative effects of the environment on output (Astin, 1991, p.19). Astin has utilized this conceptual model in assessing a variety of student outcomes in the past twenty years. He and others have used the I-E-O model to examine a myriad of educational effects such as student persistence, student talent development, Ph.D. productivity, cognitive outcomes, and satisfaction.

Three fundamental assumptions that form the cornerstone of the I-E-O model are:

1. The output of an institution or program does not really tell us much about its educational impact or educational effectiveness. Rather, outputs must always be evaluated in terms of inputs.
2. An output measure is not determined solely by a single input measure.
3. Even if we have good input and output data, our understanding of the process will be limited if we lack information on the college environment. (Astin, 1991, pp.17-18)
Astin’s I-E-O model is comprised of three components: input characteristics, the college environment, and student outcomes. The student outcomes can be viewed as dependent or endogenous variables. Environment and input characteristics are both types of independent variables or exogenous variables. Inputs can also be called control variables and environmental variables can be viewed as treatments or interventions (Astin, 1970).

![Diagram of Astin's I-E-O model](image)

Figure 1. Astin’s model of the relationship between input, environment and outcome (Astin, 1991, p.18)

The relationship between the three variables can be seen in Figure 1. The three arrows depict the relationships among the three components. Student inputs can be related to both environment and outcomes. The relationship between environment and outcomes cannot be adequately understood without taking into consideration student input.

The determination of which variables to consider is a matter of informed decision. "Nothing in human experience is intrinsically an input, an output, or an environment. How we should assign these labels depends entirely on what aspects of experience we choose to study and how we formulate the questions we wish to answer" (Astin, 1991, p. 22).
Student incoming characteristics are those inputs that the researcher believes will influence the student outcomes without taking into account the specific environment. The incoming student characteristics, according to Astin, are vital in establishing a baseline for value-added or talent development outcomes. Without input data on the entering student it is not possible to determine what effect educational policies and practices had on the students. Incoming student characteristics are the input variables which consist of such information as individual skill, gender, aptitude, race, and socio-economic status (SES) - in other words, those qualities which the individual student brings to college.

The college environment, in Astin's model, includes everything that happens to a student during the course of an educational program. The college environment consists of the actual and perceived experiences of the student while attending college. The environment would include courses taken, individual instructors and their teaching methods, the physical surroundings, co-curricular activities, and special services such as tutoring, orientation, and counseling. The student's individual reaction to, or perception of, the environment has an impact on that environment. Therefore, student satisfaction for example, can influence the outcome measures.

Astin believes that students learn best in college by becoming involved. He defines involvement as the amount of physical and psychological energy the student devotes to school (Barr & Upcraft, 1990). Astin postulates five basic points:

1. Involvement refers to the investment of physical and psychological energy in various "objects." The objects may be highly generalized (the student experience) or highly specific (preparing for a chemistry exam).
2. Regardless of its object, involvement occurs along a continuum. Different students manifest different degrees
of involvement in a given object, and the same student manifests different degrees of involvement in different objects at different times.

3. Involvement has both quantitative and qualitative features. The extent of a student's involvement in academic work can be measured quantitatively (how many hours the student spends studying) and qualitatively (does the student review and comprehend reading assignments, or does the student simply stare at the textbook and daydream?).

4. The amount of student learning and personal development associated with any educational program is directly proportional to the quality and quantity of student involvement in that program.

5. The effectiveness of any educational policy or practice is directly related to the capacity of that policy or practice to increase student involvement.

(Astin, 1985, pp. 135-136)

Determining involvement is not always easily accomplished. Astin suggests that many times the most appropriate manner is to rely on the student's report.

...the richest source of data on the students' environmental experiences is the students themselves. In this instance we are basically using the student as an observer or informant to tell us what kinds of environmental experiences he or she has had. Usually the gathering of such information is done by questionnaires which the student completes after being exposed to the environment. (Astin, 1991, p.85)

Student outcomes are those attributes of the student's development that the college either influences or attempts to influence through the collegial environment. Astin recommends the use of both cognitive and affective outcomes and suggests that both students and colleges should have a hand in the determination of the outcomes (Astin, 1991). These could include student opinions, academic attainment, attitudes, skill achievement, persistence, goal attainment, or job placement success.
This final component of the I-E-O model is probably the most difficult to operationalize and measure. Defining and measuring outcomes requires the use of value judgments (Astin, 1991). An institution's decision on what student outcomes to assess should be based on the philosophy and institutional mission of the college (Jacobi, 1987; Hudgins, 1991). Therefore, what might constitute appropriate student outcome measures for one institution might not be at all helpful for another institution. This can be seen in the case of using persistence or student retention as a measure of student outcome and institutional effectiveness for all colleges. There is serious question as to whether persistence is a valid measure of student outcome for community colleges (Adelman, 1992).

A second quite similar, though more explicit, sociological model of institutional impact is Tinto's model. Tinto theorizes that students enter a college with varying personal, family, and academic characteristics and skills. These characteristics and skills are modified and reformulated by the college experience. Positive experiences lead to integration of the student which in turn leads to retention. Negative experiences tend to distance the student from the institution, leading to detachment and ultimate withdrawal (Pascarella & Terenzini, 1991). Figure 2 presents a graphic representation of Tinto's model.

Although Tinto focuses on retention, his model has been used to study other student outcomes, such as academic skill acquisition (Volkwein, King & Terenzini, 1986), personal change (Terenzini & Wright, 1987), and college major changes (Theophilides, Terenzini, & Lorang, 1984). In fact, the underlying dynamic of Tinto's theory is quite similar to Astin's involvement theory (Pascarella & Terenzini, 1991). The literature review will examine research using both Astin's and Tinto's
Figure 2. Tinto's model of institutional departure (Pascarella, 1991, p.5)
The practice of combining these two models can be found in a number of dissertations written since 1989 (Shepard, 1989; Von Destinon, 1989).

Von Destinon posited that student integration into the academic and social systems of an institution, the nucleus of Tinto's theory, is quite similar to Astin's concept of involvement. He made a comparison of Tinto's variables of interaction with the college environment and Astin's factors of environmental involvement and concluded that although Tinto's variables are more comprehensive than Astin's factors, they both cover related areas (1989). The relationship between the two models can be seen in Figure 3.

![Figure 3. A comparison of the components of the Astin and Tinto models.](image)

Astin's Input Characteristics correspond to Tinto's Pre-Entry Attributes and Time 1 (T1) Goals and Commitments. The College Environment in the Astin I-E-O model is contained in the Tinto model in Institutional Experiences (Academic and Social), Integration, and Time 2 (T2) Goals and Commitments. Outcome is the same for both models.
An original, theoretical a priori model of degree persistence developed specifically for 2-year college students was proposed by Mel Webb, who maintains that the Tinto model does not take nontraditional students into consideration (Webb, 1989). Webb structured his research to gather data at the time of enrollment. His proposed research model includes external environment, academic self-confidence, and expected student/college fit as environmental factors and relegates social integration to a minor role outside the main effects of the model.

Incoming student characteristics gathered by Webb at the time of enrollment included year of birth, gender, race, ESL (English as a Second Language) status, type of high school certificate earned, ASSET scores (assessment tests specifically designed for and normed on community college students), certainty of major, employment plans, educational goal, transfer plans, expressed need for help with finances, jobs, career choice, study skills, vocational education program status, reason for attending, degree intent, and day/evening student status. First semester GPA and number of courses passed/failed were tabulated at the end of the first semester as the outcomes measure (Webb, 1989).

After examination of the previous sociological models, the I-E-O model developed by Astin was chosen as the basis for this study. The decision was based on the flexibility of the model, which allowed for the tailoring of the variables to specifically correspond to those thought to be pertinent for the college. This model was designed to be used as a conceptual guide for assessment activities in higher education and thus allowed for the measurement of individualized outcome variable dependent upon the mission and goals of the college. Finally, the statistical analysis suggested for this model addressed the questions posed for this study.
Purpose of the Study

The primary purpose of this study was to identify which incoming student characteristics and college environment variables were most predictive of student success at North Iowa Area Community College; and to relate that information to institutional effectiveness. Using the model developed by Alexander Astin, the researcher investigated the following input variables:

- Academic achievement at the time of enrollment
- Gender
- Race
- Age
- Socio-economic status
- Educational goal
- Personality type

As they relate to environmental variables of:

- Full or part time attendance
- On or off campus classes
- Commuter or dormitory residence
- Major area of study
- Student involvement
- Goal congruence
- Student satisfaction

In influencing student success, measured by:

- Self-assessment
- Grade point average
Ratio of number of hours completed to number of hours attempted
This information was gathered to be used in evaluation of the college goal of access and equity.

Research Questions
The investigator was interested in answering the following questions:

1. Which incoming student characteristics, if any, have an impact on student success?

2. After controlling for incoming student characteristics, what relationship, if any, do college environment variables have with student success?

3. What relationship, if any, do specific incoming student characteristics have to college environment variables?

Research Design
This study utilized a theoretical research design based on a model developed by Astin (1965, 1985, 1991). Designed to be used as a conceptual guide for assessment activities in higher education, Astin's model is comprised of three components: Incoming Student Characteristics, College Environment, and Student Outcomes. Commonly referred to as the I-E-O model (input-environment-output), it provides a framework for assessment and evaluation activities.

The Incoming Student Characteristics, according to Astin, are vital in establishing a baseline for value-added or talent development outcomes. Without input data on the entering student it is not possible to determine what effect educational policies and practices had on the students. Incoming Student Characteristics are the input variables which consist of such information as
individual skill, gender, aptitude, race, and personality type - in other words, those qualities which the individual student brings to college. For the purpose of this study, incoming characteristics include age, gender, race, entering assessment scores, socio-economic status, educational goals, and MBTI personality type. Although MBTI personality type has not been used widely in general sociological models as a specific incoming student characteristic, it has been shown to impact student outcome (Kalsbeek, 1989; Kalsbeek, 1986; Provost & Anchors, 1987). Since NIACC assesses MBTI type during new student orientation they have the opportunity to use personality type as one variable.

The College Environment consists of the actual and perceived experiences of the student while attending college. The environment would include courses taken, individual instructors and their teaching methods, the physical surroundings, co-curricular activities, and special services such as tutoring, orientation, and counseling. The student's individual reaction to, or perception of, the environment has an impact on the environment.

Environmental factors measured include location of classes most frequently attended (on or off campus), full or part time attendance, commuter or dormitory residence, major area of study, involvement in specific areas of the college (tutoring, residence hall, athletics, social events), goal congruence between the student and institution, and satisfaction with the college. Students who were first time enrollees in September 1991 were surveyed during the month of April concerning their knowledge of services available, use of those services, and satisfaction with specific services, as well as satisfaction with the college as a whole.
Student outcomes are those attributes of student development or talent development that the college either influences or attempts to influence through the college environment. For the purpose of this study, the student outcome to be measured will be denoted student success. Astin recommends the use of both cognitive and affective outcomes and suggests that both students and colleges have a hand in the determination of the outcomes (Astin, 1991). In keeping with Astin’s recommendation that both cognitive and affective outcomes be considered and that both students and the college should have a voice in the determination, the outcome chosen was student success. Student success is becoming a more widely accepted measure of institutional effectiveness and student outcomes, especially for community colleges (Alfred, 1992).

However, the definition of student success is open to various interpretations. Student success can be viewed from the perspective of the student or of the institution or from both perspectives. The most comprehensive measure of student success takes into account both the goals and behaviors of the student and the goals and mission of the college. Student success then can be viewed as the achievement of what the student and/or the institution values (Floyd, 1987). Student outcomes measuring student success need to take into account both behavioral and psychological factors. Student success can be measured in terms of academic standards, course completions, student goal attainment, course preparation, and accreditation standards (Alfred, 1992; California Community Colleges, 1990).

Success measures include: Does the student obtain his/her goal(s) and view the educational experience as successful; and does the community college view the performance of the student as successful. Most community colleges have a minimum
grade point average which must be met to continue attendance. Financial aid such
as the Pell Grant requires a minimum grade point average and a ratio of the
number of credit hours which must be successfully completed in relation to the
number of hours attempted. NIACC has a prerequisite of a 2.0 grade point average
to be considered successful; in addition, in order to be eligible for financial aid, a
student must have completed at least half the credits attempted. Consequently, the
cognitive measure of outcome for student success will be determination by the
college of acceptable GPA (2.0) and ratio of courses completed compared to courses
initially attempted (1:2). Student affective outcome measure will consist of a self-
assessment of success in meeting individual goal(s) which was included in the
student survey questionnaire in the spring.

Paul Kreider, president of Mt. Hood Community College, stated in the
foreword of "Assessing Institutional Effectiveness in Community Colleges" that "as
we implement campus-based assessment programs, it is also important that we
maintain our fundamental focus on student success" (Doucette & Hughes, 1990, iii).
By delineating student success as the outcome of this research, and determining
which incoming and environmental characteristics contribute to that success, the
college can adjust processes and services to better meet the needs of the NIACC
student.

Definitions

Student - first time enrollees in one or more college credit course(s) at North
Iowa Area Community College in the Fall of 1991.
Personality type - measured by the MBTI Form G, self-scorable which is administered during orientation to incoming students.

Academic achievement at time of enrollment - assessment results utilizing the Nelson-Denny Reading Score Composite, ASSET Math Numerical Test Form B Score, a holistic writing sample scored by NIACC faculty, high school grades and rank, and ACT scores when available.

Student Satisfaction - measured by the ACT Student Opinion Survey (Two-year College Form) with additional locally developed items administered during the last month of classes in the spring of 1992.

Student involvement - amount of services utilized by students during the academic year as self-reported on the ACT survey.

Goal Congruence - the amount of agreement between importance of goals to student compared to the student's perceived importance of the same goals to the college. Goals measured included the stated institutional goals. Students rated the goals on the Student Opinion Survey administered in the spring.

Student Success - measured by Grade Point Average, number of hours completed compared to number of hours attempted, and self-assessment of success contained in the Spring 1992 student opinion survey.
Assumptions

1. The questionnaire used in this study was administered at a time when external events did not influence the general response of the student.

2. The students responded truthfully on the questionnaire.

3. The MBTI Form G, self-scorable provides an accurate measure of personality type.

4. The permanent records and registration records maintained by the college are accurate and reliable.

5. The students were truthful on their admissions applications.

6. Academic assessment instruments provided a reliable and valid indication of achievement at time of enrollment.

Limitations

Inherent in studies of this nature are limitations that affect the generalizability and utility of results. This research was confined to only one community college. Community colleges are diverse institutions just as community college students are diverse populations. Additional research using the same measures at various community colleges would add greatly to the applicability of this study.

Another limitation is that students from one point of entry only were considered. The data may not be representative of students who began school the semester before or the semester after the target population. Longitudinal studies at the same institution or multi-institutions would again increase the generalizability of this information.

A lack of a commonly accepted measure of student outcomes for gauging community college effectiveness is a limitation in this study. The tendency to use
retention or persistence as an appropriate outcome masks important issues at the community college level. Studies focusing on student goals and institutional impact are needed.

Stepwise multiple regression is not universally accepted as an appropriate methodology in prediction studies (Thompson, 1989). Full-fitted or hierarchical regression are more conservative. This study utilized stepwise multiple regression in keeping with Astin's methodology, however, other methods may have yielded slightly different results.

Organization of the Study

This study is divided into five chapters, a reference section and an appendix. Chapter I, the introduction, includes a background of the assessment of institutional effectiveness, an overview of theoretical models, a discussion of sociological models, and a brief look at community college research. It also includes an institutional profile, purpose, definitions, research questions, design, assumptions, limitations, and organization of the study. Chapter II presents summaries of pertinent research related to this study. The literature review is divided into five parts. Part 1 examines college impact models, including the I-E-O model; part 2 assesses community college research; part 3 examines MBTI personality type as it affects students; part 4 discusses the Student Opinion Survey; and part 5 summarizes the chapter. Chapter III contains the methodology for this study. The population and instrumentation are described as well as hypotheses, operationalized definitions of variables, and data analysis procedures. Chapter IV provides analysis and
interpretation of the data. Chapter V includes a summary of the research and recommendations for future studies.
CHAPTER II. LITERATURE REVIEW

This chapter examines selected prior studies of incoming student characteristics and college environment as they impact student outcomes. The literature review is divided into the following topics: 1) College impact models, including Astin's I-E-O model; 2) Community college research; 3) MBTI Personality research studies; 4) Student Opinion Survey; and 5) Summary.

College Impact Models

As noted in Chapter I, college impact models lend themselves readily to institutional effectiveness studies since they take into account the student, the college effect, and the outcome. This section will examine a number of studies that used college impact models as a basis for exploring which student characteristics and college characteristics had the most impact on student outcomes. The variables used in each study differ slightly, but give a general outline of appropriate measures to consider. Astin's model, Tinto's model, and slight variations of those models will be examined. It should be noted that the majority of college impact studies, especially when measuring institutional effectiveness, focus on college persistence as the outcome. Consequently, many of the following studies which are reviewed have used persistence as the primary outcome.

Astin (1975) performed a study of entering freshmen of 1968 in a longitudinal, multi-institutional research endeavor. The purpose of this research was to determine which incoming student characteristics were most predictive of college persistence. He examined the records of approximately 101,000 students beginning
in 1972. 41,356 students returned questionnaires that had been mailed to them. The 175 item questionnaire collected data on age, gender, education level of parents, past academic achievement, and other variables. Astin posits that an average of fifteen to twenty freshman input characteristics contribute to the prediction of most student outcome measures. Therefore, the best way to control for bias from input characteristics is to incorporate as many characteristics as possible into the analysis (Astin, 1991).

According to Astin (1975) a substantial body of research has shown a highly predictive relationship between students' high school academic performance and college attrition. He used four measures of academic background to examine their correlation with attrition. The four measures were high school GPA, high school class rank, college admission test scores, and student's rating of the high school.

High school GPA was the most consistent predictor of college persistence. He found that as high school grades decreased the students' chances of stopping out or dropping out of college increased. He also noted that student composite scores on the ACT and SAT contributed significantly to dropout-proneness. The education level of the student's parents (measured on a six-point scale) contributed to dropout-proneness, also. Astin suggested that perhaps more educated parents exerted pressure on students to stay in college. In addition, children of educated parents might be more compelled to complete college since their parents did.

Student age at enrollment was also associated with Astin's study of student retention. He found that older students, especially women, were more likely to drop out than students who were 17 - 19 years of age. Thus, in Astin's study the incoming student characteristics that had the most impact on the student outcome
of persistence were high school GPA, ACT or SAT score, and educational level of parents which were all positively correlated with retention; and age and gender which were negatively correlated with retention.

Historically, men have tended to persist at a higher rate than women (Anderson & Darkenwald, 1979), which would confirm Astin's findings. However, more recent studies have shown women's retention rates equal to or greater than men's rates (Knoell, 1983; Voorhees, 1986). Because community colleges tend to have a greater proportion of women students than other colleges, this trend characteristic is of importance.

Additional studies to determine which environmental variables had the most impact on student outcomes used similar models to Astin's I-E-O model. A study blending Astin's and Tinto's models examined the integration, involvement, and persistence of Chicano students at the University of Arizona. The institutional or environmental factors with the most influence were academic preparation, use of student services, student/instructor interaction, and academic experiences (Von Destinon, 1988).

Stoecker, Pascarella, and Wolfle reported on a national, 9-year, multi-institutional study designed to assess the applicability and generalizability of Tinto's model (1988). Data for this study were obtained from respondents to the 1971 and 1980 Cooperative Institutional Research Program (CIRP) surveys. The study consisted of 10,326 students attending 487 4-year colleges and universities. The final sample contained 5,240 participants: 2021 White men, 381 Black men, 2312 White women, and 526 Black women. A model was developed which included six variable sets ordered in causal sequence: (a) student precollege characteristics,
(b) student precollage commitments, (c) institutional characteristics, (d) college
major, (e) college academic and social integration, and (f) persistence-withdrawal
behavior. Direct, indirect, and total effects were computed and tested for
significance using ordinary least squares regression and a Fortran program
developed by Wolfle and Ethington.

Four separate estimations of the model were conducted for White and Black
men and women. The results of the study were generally consistent with Tinto's
conceptualization. His contention that persistence-withdrawal behavior is largely
the result of a longitudinal process of person-environment fit was generally
supported. In particular, his argument for academic and social integration being
critical determinants of persistence was supported. College academic achievement,
interaction with faculty, and social leadership activity all had direct effects on
persistence (Stoecker et al., 1988).

Kuh, Schuh, and Whitt (1991) studied fourteen colleges and universities that
provide exemplary opportunities for out-of-class interaction and experiences to their
students. They focus strongly on the college environment and offer suggestions for
implementing practices that promote involvement. No community colleges were
involved in this study, and although diversity of students was acknowledged as a
given, they fail to take into account the varying incoming student characteristics
and how those affect the student's perceptions of and experiences in the
environment. They do, however, offer suggestions for assessing the college
environment to ascertain areas which might need to be changed to meet student
needs (child care, campus mailboxes for commuters, women's centers).
The previous studies were all examples of research using four year college students. The next set of studies will examine information gathered using community college students to see what differences, if any, can be observed.

Community College Research

Studies which have focused on community colleges as opposed to four year college students have found some differences in results, although not on a consistent basis. In 1981 Munro used data from the National Longitudinal Study of the high school class of 1972 to apply a Tinto-based model to students enrolled in 2 and 4-year colleges (Williamson & Creamer, 1988). Data for the study came from High School and Beyond - a major study conducted by the National Center for Educational Statistics of students who were sophomores and seniors in 1980. A sample of 974 community college students and 2969 4-year college students enrolled during the 1980-81 school year was used. Background variables included gender, race, socio-economic status, aptitude, locus of control, self-concept, high school grades, parental aspirations, and student educational aspirations. Integration variables were composed of academic integration and social integration. Commitment variables consisted of goal commitment and institutional commitment. Persistence was defined as if a student received a degree or certificate, or remained in the institution of initial enrollment or another institution of higher education beyond June 1982.

Results of path models of 2-year and 4-year students revealed some contrasting findings from previous studies. Two-year student samples indicated that only one background variable, locus of control, had direct effects on persistence; while four-
year student samples revealed five of the six background variables directly affected persistence. Goal commitment consistently had the strongest direct effects on persistence. The authors contend that the most plausible explanation for the differences between this study and previous studies is the difference in the operationally defined term of persistence (Williamson & Creamer, 1988).

Webb developed a persistence model specifically for two-year college students. Webb's proposed research model included external environment, academic self-confidence, and expected student/college fit as factors and relegated social integration to a minor role outside the main effects of the model. Information gathered by Webb at the time of enrollment included year of birth, gender, race, ESL (English as a Second Language) status, type of high school certificate earned, ASSET scores (assessment tests specifically designed for and normed on community college students), certainty of major, employment plans, educational goal, transfer plans, expressed need for help with finances, jobs, career choice, study skills, vocational education program status, reason for attending, degree intent, and day/evening student status. First semester GPA and number of courses passed/failed were tabulated at the end of the first semester.

A total of 36,603 records of students enrolled in one of three campuses of the Los Angeles Community College District were examined. Fifty-six per cent of the students were full-time, 15% were Black, 20% were Hispanic, 57% were White, 8% were Asian American, 55% were female, 45% were male, 35% were enrolled in vocational education programs. Means, standard deviations, and correlation coefficients were computed and a stepwise regression was conducted.
Results showed that goal commitment, external environment, expected student/college fit, and high school academic achievement were the primary factors affecting persistence. Secondary effects were provided by background, academic integration, and academic self-confidence (Webb, 1989).

Voorhees (1987) used logit modeling to investigate the influence of demographic variables that past research had shown to be significantly associated with the persistence of community college students and the influence of conceptual variables borrowed from existing persistence models designed for four-year institutions. A total of 369 new and continuing students enrolled at a suburban community college serving 5700 students in the fall of 1984 were surveyed. They were students enrolled in 56 randomly selected classes.

Students were administered the ACT Student Opinion Survey and 26 locally developed research questions probing concepts that previous research had shown to be important in explaining student persistence. Variables included gender, part/full-time status, ethnicity, student purpose, satisfaction, intent to return, GPA, frequency of contact with faculty outside the classroom, and number of hours spent studying each week. Persistence was operationally defined as reenrolling in either of two subsequent terms.

Results supported gender, purpose for enrolling, and intent to return as main effects in persistence. GPA, number of informal interactions with faculty, and number of hours spent studying did not have an interaction with persistence; nor did ethnicity nor part/full-time status. Satisfaction with the institution was also shown to be relatively unimportant (Voorhees, 1987).
Johnson and Walberg measured community college student outcomes using grade point average rather than persistence (Johnson & Walberg, 1989). From a pool of 12,000 students, 540 community college students were randomly selected. Grade point average was used to represent outcome and a multiple linear regression was performed using GPA as the dependent variable and prior achievement, development, motivation, quantity of instruction, quality of instruction, home environment, classroom environment, peers, and time as the independent variables. Prior achievement was most powerful, followed by time, motivation, classroom environment, and development. Quantity of instruction and home environment had unexpected negative effects (Johnson & Walberg, 1989).

Halpin (1990) explored the basic research question, Does the Tinto model have utility in the analysis of student persistence or exit from a community college? Halpin studied all first-time, full-time freshmen enrolled in academic degree programs at a small, open-door, nonresidential community college in rural New York during the fall semester (n=381). Students were classified as persisters (reenrolled for spring semester, n=289); dismissal (not permitted to reenroll by the college, n=56); withdrawer (voluntarily did not reenroll, n=36).

A questionnaire was administered to freshman composition classes three weeks before the end of the semester. The questionnaire gathered such information as gender, highest expected degree, parents' educational background, commuting distance, work, involvement in college organizations, informal conversations with faculty, academic conversation with faculty, perceived cost burden, peer group relations, informal relations with faculty, academic and intellectual development, and commitment.
Group discriminant function analyses were conducted, with results supporting a greater influence of academic integration than social integration. Factors which had the largest impact were faculty concern for teaching and student development, academic and intellectual development, and interaction with faculty. As a result of the analysis, Halpin asserts that "the creation of institutional mechanisms to maximize student/faculty contact is likely to result in greater levels of integration and hence persistence" (Halpin, 1990, p.31).

Person-Environment fit has been shown to have a large influence on student outcomes. Student satisfaction, student involvement, and student integration and commitment can all be traced to person-environment fit. A number of institutional accountability or effectiveness models have been designed that use student satisfaction as one of the primary measures of college environment. California community colleges have been utilizing a Community College Accountability Model since 1990 as a result of legislative action. The five major components consist of 1) student access, 2) student success, 3) student satisfaction, 4) staff composition, and 5) fiscal condition. (California Community Colleges, 1990). Glendale Community College, AZ has instituted TEX-SIS (Texas Student Information System) designed to evaluate instruction and student satisfaction (Montemayor, 1985).

Another one of the factors influencing this fit is goal congruence between what the student believes is important and what the college believes is important. Student perceptions of what the college considers important can have a greater impact on fit than what the college purports to hold as priorities. Goal commitment and institutional commitment were shown to have significant impact on student
persistence for both Black and White students in a study conducted at a large midwestern community college in 1989 (Mutter, 1992).

The purpose of a research project at Brookdale Community College was to determine whether student intention affected retention at the college. In the fall of 1988, Brookdale began administering an Entering Student Survey. This survey asked for responses concerning short and long term educational goals, student activity interests, reasons for choosing Brookdale, and demographic information. In 1988, 2,243 usable surveys were received from a possible 3,590 students.

Reasons for attending college were divided into three main categories - transfer, career, and personal interest. 51.7% of the students fell into the transfer category; 37.8% in the career category; and 10.5% in the personal interest category. When students were asked whether they intended to graduate from Brookdale 44.8% said "yes"; 31% said "no"; and 24.2% were "undecided".

The hypothesis tested was that student intention at the time of enrollment has an effect on future enrollment. The next five terms were then analyzed to see how many terms each student attended. The terms analyzed consisted of Spring 1989, Summer 1989, Fall 1989, Spring 1990, and Summer 1990. The results are listed in Table 1.

Table 1. Retention by goal type (Daniels, 1990)

<table>
<thead>
<tr>
<th>Retention</th>
<th>Transfer</th>
<th>Career</th>
<th>Personal Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 terms</td>
<td>21%</td>
<td>42%</td>
<td>49%</td>
</tr>
<tr>
<td>1 term</td>
<td>19%</td>
<td>22%</td>
<td>29%</td>
</tr>
<tr>
<td>2 terms</td>
<td>15%</td>
<td>11%</td>
<td>8%</td>
</tr>
<tr>
<td>3 terms</td>
<td>20%</td>
<td>11%</td>
<td>9%</td>
</tr>
<tr>
<td>4 terms</td>
<td>15%</td>
<td>10%</td>
<td>3%</td>
</tr>
<tr>
<td>5 terms</td>
<td>10%</td>
<td>4%</td>
<td>2%</td>
</tr>
</tbody>
</table>
Almost half of the students attending in the fall semester who cited personal interest as their primary reason for attendance did not return for a second semester. Over three quarters of the students did not return for more than one additional semester. Whether these students were "successful" or "non-successful" would depend on their initial goal rather than the number of semesters they attended.

Retention by graduation plans gave additional information germane to community college research and retention. Table 2 shows that those students not intending to graduate were most likely to attend fewer terms. Seventy percent of the students not intending to graduate returned for one or less terms compared to 55% of those undecided and 42% of those intending to graduate.

Table 2. Retention by graduation plan (Daniels, 1990)

<table>
<thead>
<tr>
<th>Terms</th>
<th>Yes</th>
<th>No</th>
<th>Undecided</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 terms</td>
<td>23%</td>
<td>45%</td>
<td>35%</td>
</tr>
<tr>
<td>1 term</td>
<td>19%</td>
<td>25%</td>
<td>20%</td>
</tr>
<tr>
<td>2 terms</td>
<td>13%</td>
<td>11%</td>
<td>15%</td>
</tr>
<tr>
<td>3 terms</td>
<td>19%</td>
<td>11%</td>
<td>15%</td>
</tr>
<tr>
<td>4 terms</td>
<td>17%</td>
<td>5%</td>
<td>11%</td>
</tr>
<tr>
<td>5 terms</td>
<td>10%</td>
<td>3%</td>
<td>6%</td>
</tr>
</tbody>
</table>

Analysis of reenrollment patterns confirmed that students have a variety of goals and that these goals significantly affect their retention. This has serious implications for the validity of 4-year retention models when applied to community college students. Community college student success must be measured in light of their individual goals and intentions (Daniels, 1990).
The previous community college studies have revealed a number of differences between significant variables influencing four year college student outcomes and two year college student outcomes. In a number of studies (Voorhees, 1987; Webb, 1989; Williamson & Creamer, 1988), academic and social integration were shown to have little effect on student outcomes, which is in direct contrast to findings by Tinto (1987) and Astin (1985). Goal commitment, purpose for enrolling, and graduation plan were important variables for community college students (Daniels, 1990; Mutter, 1992; Webb, 1989). The large majority of studies presented earlier in this chapter used persistence because that has historically been an approved measure of effectiveness for four year colleges and universities. At most what studies utilizing community college data did was to redefine persistence (e.g. reenrolling within the next two semesters) (Voorhees, 1987). Community college literature is beginning to look more and more to other measures of effectiveness in evaluation processes (Adelman, 1992; Alfred, 1992) as goals other than degree completion gain acceptance.

Just as more diverse goals are gaining acceptance for community college attendance, so too are different teaching styles and methodologies becoming more widespread. Diversity has become an accepted and valued concept among those who work in the community college arena. Successful student outcomes can be greatly influenced by student personality type and learning style. Although this incoming student characteristic has not been used in the college impact model research cited in this chapter, it deserves a place in this review of the literature.
The MBTI, based on Jung's theory of psychological type, reports people's preferences on four scales. Each scale represents two opposite preferences. There is no right or wrong to these preferences. The scales measure focus of attention (extraverted/introverted), preferred method of taking in information (sensing/intuitive), decision making preference (thinking/feeling), and preferred lifestyle (judging/perceiving). Type is the combination of a person's four preferences (Myers, 1991).

Although MBTI personality type has not been widely used as an incoming student characteristic in general sociological models of college impact, a variety of studies have been conducted which explore the relationship between personality type and student outcome. The TRAILS (Tracking Retention and Academic Integration by Learning Styles) research project used MBTI in assessing student performance and persistence. This project determined the personality type of a large proportion of the entering freshman class at Saint Louis University beginning in 1981. Longitudinal data from 1982 to 1985 considered links between student personality type/learning style and student academic achievement and aptitude. Results showed that the greater the preference for intuition (N) and for introversion (I), the better the first term grade point average, and the greater the preference toward the judging mode (J), the better the GPA (Kalsbeek, 1986).

Another population studied was that of undecided majors. According to Tinto (1987), being uncommitted to a specific major may put students at risk. Many institutions have found undecided majors to be drop-out prone. Type profiles on undecided majors suggest that the types most overrepresented in the undecided
group are IPs (introverted perceivers) and NPs (intuitive perceivers) (Provost & Anchors, 1987). The TRAILS data suggest that the STP (sensing, thinking, perceiving) combination was overrepresented as "undecided" (Provost & Anchors, 1987).

Jensen (Provost & Anchors, 1987) found that thinking (T) types are more apt to meet with academic success than are feeling (F) types. Nisbet, Ruble & Schurr (1982) found that for returning adults, minorities, and underprepared students, personality type, especially the Judging/Perceiving preference increased the predictive ability of standardized tests and high school grades for college students.

In higher education, there are myriad measures of student characteristics, college environment, and student outcomes. The scope of those measures determines the adequacy and the accuracy of data analysis. Consequently, the methods of collection and instruments used to collect information have a large impact on the results and applicability of the study. Astin (1990) notes that although some within-environment experiences can be obtained from institutional records, much of the information needs to be gathered directly from the students by means of questionnaires. The surveys and questionnaires that have been developed and normed on a national basis can be of great value to researchers in the field. Validity, reliability, and applicability that are already established can provide money and time benefits. One survey which has been used in institutional effectiveness studies, especially in community colleges is the ACT Student Opinion Survey - 2 year college form.
Student Opinion Survey

The Student Opinion Survey - 2 year college form was developed by ACT. It was designed to explore the perceptions and use of enrolled community college students regarding the institution's programs and services. This survey has proven useful in the determination on student involvement, student satisfaction, and college environment (Voorhees, 1987; Jonas, 1992).

The survey contains six sections. Section 1 contains a variety of demographic and background items including age, gender, full time/part time status, race, and major. These items can be used as incoming student characteristics. Section 2 assesses the students' general impressions of the college. Sections 3 and 4 identify the level of usage of college services as well as the students' satisfaction with those services. These sections contribute valuable knowledge concerning the community college environment. Section 5 allows for 30 local questions to determine information not covered in the other sections that allows for the customization of the survey to each institution. Section 6 provides space for students to offer comments or suggestions (ACT, 1989). ACT offers additional surveys that are designed to measure other educational topics and audiences.

Summary

The first section of this chapter reviewed college impact models generally used when assessing college student change (including the Astin I-E-O model) as an appropriate conceptual framework for determining the impact on community college students. The second section of the literature review examined Community College research as it pertained to student outcomes such as persistence and grade point
average. Differences in outcomes between four-year students and two-year students were noted. The third section examined MBTI personality type as it relates to college student performance. The fourth section briefly discussed the ACT Student Opinion Survey.
CHAPTER III. RESEARCH DESIGN AND METHODOLOGY

The purpose of this study was to identify the incoming student characteristics and college environment variables that affect the outcome of student success as it relates to the access and equity goal of the college. Incoming characteristics include personality type, student achievement at the time of enrollment, educational goal, age, race, socio-economic status, and gender. College environment includes student involvement, student residence, full/part time status, location of classes, goal congruence, and student satisfaction. This chapter describes the research design and methodology used in this study.

Sources of Data

Population

The population for this study was comprised of all first time enrollees at North Iowa Area Community College for the Fall 1991 term. Students attending off-campus centers were included, as were evening and part-time students. This population was selected so that prior experience at NIACC would not be a contaminating factor in determining student incoming characteristics and college environment impact.

Sample

The study included all students qualifying as first time enrollees (1019 students). Students who withdrew during fall or spring semester, and those who did not return for spring semester were mailed surveys (224); students still enrolled during the last month of spring semester were surveyed in their classes (795).
Characteristics of the students which were measured included age, gender, race, educational goal, socio-economic status, personality type, and academic assessment results.

Data Gathering

The data on each student in the sample was derived from four sources: NIACC registration records, NIACC permanent records, student admission applications, and a student survey questionnaire administered the final month of school in the Spring of 1992.

The NIACC registration records provided the following information:

- Name
- Student Address
- Social Security Number
- Academic Assessment Data
- MBTI Personality Type
- Class schedule
- Major program of study

The NIACC permanent records contained the following information:

- College cumulative grade point average
- Semester hours attempted
- Semester hours completed
- Date of withdrawal
- Date of graduation
- Last known address

The admission application was the source of information concerning:

- Name
- Permanent address
- Social Security Number
- Gender
- Race
- Age
- Educational goal
The survey used was the Student Opinion Survey for 2-year colleges developed by ACT. Information on the surveys include:

- Educational goal
- Social Security Number
- Age
- Race
- Gender
- Involvement
  - Academic advising
  - Personal counseling
  - Vocational guidance
  - Job placement
  - Financial aid
  - Athletics
  - Library
  - Residence hall programs
  - Tutorial services
  - Social activities
  - Cultural programs
  - College orientation
- Satisfaction with above services, as well as:
  - Academics
  - Admissions
  - Rules and policies
  - Facilities
  - Registration
  - College in general
- Additional questions eliciting
  - Self-assessment of success in meeting educational goals
  - Future educational plans
  - Estimated number of hours per week spent on college activities outside classroom.
  - Importance of ten institutional goals to student
  - Perceived importance of ten institutional goals to the college
  - Educational level of both parents
  - Financial aid receipt

Standardized instruments used to gather the data for this research included the Myers-Briggs Type Indicator (MBTI) and the ACT Student Opinion Survey - 2 year college form. The MBTI, Form G is administered to students during new student orientation and registration at NIACC. Results are shared with the
students and implications for learning styles, study skills, peer relationships, student involvement, and preferred classroom interaction are discussed in group seminars. The ACT Student Opinion Survey was chosen by the researcher in consultation with college administrators. Specifics concerning the two instruments are included in the following section.

Instrumentation

**MBTI**

The Myers-Briggs Type Indicator (MBTI), Form G self-scorable is a 126 item assessment instrument designed to make the theory of Carl Jung's psychological types understandable and useful in peoples’ lives. Form G is now the standard form of the MBTI. The MBTI is appropriate for adults and high school students.

The MBTI uses four preference scales to determine student personality type. Eight characteristics are put on four dichotomous or bi-polar scales and students are assigned one preference or the other on each scale depending on their responses to the MBTI questionnaire. The four scales include extraversion/introversion, sensing/intuitive, thinking/feeling, and judging/perceiving. There are sixteen possible combinations of the four scales leading to sixteen personality types. (Myers, 1980).

The reading level of the phrase questions is estimated to be seventh to eighth grade with a range of sixth to eleventh grade based on the Dale-Chall formula. The word pairs are above the fourth grade level but the reading level is not estimated because the Dale-Chall formula is based on sentence length as well as word complexity (Myers & McCaulley, 1988).
Test-retest reliabilities revolve around the practical question of whether a person will come out the same MBTI type on retest. Test-retest reliability is .75 for the total type. Individual variations are influenced by intelligence, length of time between test situations, strength of preference, and personality type (Myers & McCaulley, 1988). Because the MBTI was designed to implement Jung’s theory of type, its validity is determined by its ability to demonstrate relationships and outcomes predicted by theory. MBTI scores have been correlated with interest inventories (Kuder, Strong Campbell), with personality assessments (16 PF Questionnaire, MMPI, Eysenck Personality Questionnaire), and other instruments (Conflict Management, Locus of Control). Significant correlations have been shown for many of the constructs measured by both instruments (Myers & McCaulley, 1988).

**Student Opinion Survey**

The survey instrument used in this study was selected as the result of a six-step process. The steps included: 1) Review and evaluation of survey instruments; 2) Choice of the ACT Student Opinion Survey - 2 year college form; 3) Development of supplemental questions; 4) Review of questions by an advisory group; 5) Pilot Testing of the survey; and 6) Administration of the survey.

**Step 1.** Step 1 involved the examination of literature related to survey development and available commercial survey instruments. Data gathering potential, cost, validity and reliability considerations were used to evaluate existing survey instruments. The decision was made to use a commercial survey rather than to develop one locally. Surveys were examined for content to see which surveys most closely matched the variables to be measured.
Step 2. The ACT Student Opinion Survey - 2 year college form was determined by the researcher and NIACC administration to be the most appropriate survey. Reasons for the choice of the ACT survey were: 1) Locally developed questions could be included along with the standardized questions; 2) The information gathered from the survey resulted in answers to most of the research variables and what few topics were not covered could be asked in the locally developed questions; 3) The survey was specifically designed for 2 year colleges; 4) Previous research at NIACC had utilized the ACT Alumni Survey, thus data could be collected for eventual longitudinal research studies; 5) The cost was acceptable to administration.

Step 3. Supplemental survey questions were developed to elicit answers to variables not covered by the survey or collection sources available at NIACC (admissions applications, registration records, and permanent records). The content of these questions was discussed with advisory personnel from student services, instructional services, administrative services, and Iowa State University faculty.

Step 4. The supplemental questions along with the commercial survey were distributed to advisory personnel (student services, instructional services, administrative services) and suggestions for wording change, clarification, and ease of answering format change were incorporated into the instrument.

Step 5. Face validity was ascertained by administering the survey with appropriate cover letters and instructions to 14 second year students who would not be surveyed in the study. Students were asked to react to questions they thought were ambiguous or to make other comments concerning the questionnaire. The average time to complete the questionnaire was 21 minutes.
Step 6. Administration of the survey. A number of survey procedures were used depending on the status of the student. Two weeks before survey administration a letter and sample survey were sent to all faculty explaining the process and alerting them to the fact that they might be receiving surveys to distribute in class. All Communication Skills instructors received surveys to distribute in their classes; all vocational program leaders received surveys to distribute in their classes; all evening faculty received surveys; all off-campus instructors received surveys. Any student who had withdrawn during the semester or who had not returned the second semester was mailed a survey.

Reliability and validity of the Student Opinion Survey were discussed in the ACT User's Guide (1989). According to the guide, the instrument was developed after a thorough review of pertinent literature and consultation with expert practitioners in the field. Preliminary versions were reviewed by educators, then a pilot version was administered to several hundred students. Pilot data were then analyzed and the final instrument was prepared. Direct evidence of content and face validity lies in the items. They are easy to read, straightforward, and deal with specific areas of the college. The guide asserts that standard reliability measures are not appropriate for the Student Opinion Survey because it has no logical scales on which to base a total score.

Therefore, the guide presented reliability in terms of the percentages of the respondents who selected the same (or similar) item responses on two separate administrations of the instrument. Reliability estimates using this method were .9 or higher (it should be noted that these analyses dealt with the four year survey
rather than the two year form), however, the implication was that results would be similar.

These two instruments plus the data gathered from the aforementioned NIACC records were then used to test three null hypotheses. The three null hypotheses were derived from the research questions. These hypotheses are reported and analyzed in Chapter IV.

Hypotheses

1. There is no significant relationship between incoming student characteristics and student success.

2. After controlling for incoming student characteristics there is no significant relationship between college environment variables and student success.

3. There is no significant relationship between incoming student characteristics and college environment variables.

Survey Procedures

In April, 1992 surveys were administered in all Communication Skills I and Communication Skills II classes, as well as in a course required for vocational students. Surveys were also administered in all night classes and off-campus classes (N=795). The 224 students who were no longer attending NIACC were mailed a letter and survey asking that the survey be returned in an enclosed reply envelope. A cover letter with each survey explained the purpose of the survey and asked for the student's cooperation (see appendix). A follow-up letter was sent to students who had not returned mailed surveys by the cut off date. Fifty-two percent of the currently enrolled students returned surveys (n=415); eight percent of the
non-attending students returned Surveys (n=19). This resulted in an overall return rate of 43%. The large difference in the proportion of returned surveys between current students and students no longer attending may result in this study being more representative of those students who remained in school.

Students were assured that confidentiality would be maintained and that results would be reported on a group basis only. Students were instructed that they were able to skip any questions that they did not choose to answer. Approval by the Iowa State University Human Subjects committee was granted for this research in the Fall of 1991. Each returned survey was inspected for completeness and then forwarded to ACT for scoring. A copy of the ACT survey and additional local questions are included in the appendix.

As a result of a review of the literature and discussions with community college and university personnel; and after initial runs which revealed colinearity between certain variables (total number of hours attempted vs full/part time; age vs number of years employed), the following variables were chosen to be included in the analysis. Age, gender, race, prior academic achievement, and socio-economic status have historically been accepted as influences on student outcomes; MBTI personality type was a variable that the institution was interested in documenting; and educational goal has been generally accepted as important for community college student outcome. The college environment variables were determined to measure the primary differences of college impact on community college students.
Independent Variables

Incoming Student Characteristics
  Age
  Gender
  Race
  Personality type
  Academic achievement at time of enrollment
  Educational goal
  Socio-economic status

College Environment
  Full/part time status
  On/off campus attendance
  Commuter/dormitory residence
  Major area of study
  Student involvement
  Student satisfaction
  Goal congruence

Dependent Variables

Student Success
  Grade point average
  Ratio of hours completed to hours attempted
  Self-assessment of meeting goal(s)

For the purpose of clarity and replicability, operationally defined variables for this study are being included. Data were entered into the SYSTAT statistical package (SYSTAT, 1990) in both categorical and numerical form depending on how they were stored in their primary sources. Categorical data were then transformed to numerical variables in order to allow for statistical manipulation. Incoming student characteristic variables of age, gender, and race are self explanatory, however personality type, academic achievement, educational goal and socio-economic status need further clarification. Codes used for computer entry are also identified for each variable.
Operational Definitions

Incoming Student Characteristic Variables

**Personality type** - The MBTI four letter combination of typology is recorded on the NIACC registration biographical screen for each student - this four letter combination was recorded for each student. MBTI1 - E=1, I=0; MBTI2 - S=1, N=0; MBTI3 - T=1, F=0; MBTI4 - J=1, P=0. Each scale was entered independently.

**Academic achievement** - Designated high, borderline, low. Factors included ACT scores (23 or higher composite = high; ACT of 18 - 22 = borderline; ACT below 18 = low). Nelson Denny Reading composite (above 12th grade = high; between 9th and 12th grade = borderline; below 9th grade = low). ASSET math (Above 20 = high; between 15 and 20 = borderline; below 15 = low). Holistic writing sample (1 = high; 2 = borderline; 3 = low). Class rank (top 1/3 = high; middle 1/3 = borderline; bottom 1/3 = low). Coded HIACHV=1 or 0; BACHV=1 or 0.

**Educational Goal** - Section I, Item D on Student Opinion Survey - For what purpose did you enter this 2-year college? (Degree or Diploma - answers 5, 6, or 8; Other - answers 1-4, 7, or 9). Coded EDGOAL: Degree or Diploma or 4 year school transfer = 1; Other = 0.

**Socio-economic status** - Section V, Items 6, 7, 8 (Low SES - items 6 & 7 a, b, or c and item 8 yes; Mid SES items 6 & 7 a, b, or c or item 8 yes; High SES items 6 & 7 d - h and item 8 no). Father's education level, mother's education level, and Pell Grant receipt were the intermediate variables. Coded SESH1.
College Environment

**Full/part time status** - Transcript (Full time - attempted 12 hours or more each semester attended; Part time - attempted fewer than 12 hours one or both semesters attended). Coded FTPT: Full time=1, Part time=2.

**On/off campus attendance** - Survey Section V, Item 10 - Which of the following best describes the location of your classes? (On campus item 10 either a or c; Off campus item 10 either b or d). Coded LOCCLAS: On campus=1, Off campus=0.

**Commuter/dormitory resident** - Survey Section III, Item 8 (Commuter - I have not used this service; Dormitory resident - I have used this service). Coded DORMU: Dorm resident=1, Commuter=0.

**Major** - Survey Section I, Item P. Coded MAJOR1.

**Student involvement** - Survey Section V, Item 4 and Section III, Items 1,2,3,6,7,8,10,13,14,15,17. (High involvement - Section V, Item 4 c, d, or e and at least 6 I have used this service answers to Section III; Low involvement - Section V, Item 4 a or b and/or fewer than 6 positive answers to Section III). Coded INVOLV: High=1, Low=0.

**Student satisfaction** - Survey Section IV, Item 44. Coded GENERAL.

**Goal congruence** - Survey Section V, Items 11-20 & 21 - 30. (Difference between each paired item calculated e.g. 11 & 21, 12 & 22, 13 & 23; absolute value of the differences summed; total divided by ten - High congruence - value less than or equal to 1; low congruence - value greater than 1). Coded GCONG High=1 or Low=0.
**Student Success Variables**

*Grade point average* - Actual GPA from transcript (Successful - 2.0 or greater; Not successful - less than 2.0) Coded GPA.

*Completion ratio* - Transcript (Successful - at least 1/2 hours attempted were completed; Not successful - fewer than 1/2 hours attempted were completed) Coded SHATT/SHEARN

*Goal attainment* - Survey Section V, Item 3 (Successful - Item 3 answer a or b; Not successful - Item 3 answer c or d) Coded GSUCCESS.

**Data Analysis**

The data were analyzed by a two-level procedure using both descriptive and inferential statistics. Scoring and a Summary Data Report of the completed Student Opinion Surveys were obtained from ACT. In addition a disc was also purchased from ACT which contained all of the raw data from the surveys. Information from NIACC records was downloaded from the POISE mainframe system also on to disc. Data fields were then established in order to combine data for further data analysis. The SYSTAT 5.03 statistical package was used for analysis (SYSTAT, 1990).

Descriptive statistics were calculated for the data. Descriptives included count, percentage, mean, and standard deviation of dependent and independent variables as applicable. ACT provided descriptive data from the survey results; descriptives from the other data were obtained using the SYSTAT program. Descriptives included age, race, gender, full/part time, day/evening classes, dormitory/commuter residence, on/off campus classes, educational goal, major, grade point average, and student success.
Inferential analysis began with regression. A stepwise multiple regression was used to first determine the impact of incoming student characteristics on student success. After incoming characteristics were controlled for a second set of variables - college environment - was used to measure the impact in an additional multiple regression procedure. This second multiple regression was performed in three variations. The first method forced all eleven input variables into the equation, and then allowed the environmental variables to be entered. The second procedure forced the six significant input characteristics into the equation, and then allowed the environmental variables to be entered. The third procedure did not force any variables and all variables had equal chance to enter. All three procedures resulted in the same environmental variable entering the equation. Pearson correlation was used to test Hypothesis 3. A correlation matrix is included in Chapter IV.

Multiple Regression

Multiple regression is a procedure whereby two or more independent variables are used to predict a dependent (outcome) variable. The basic ingredients used in multiple regression are the correlations among the independent variables. Only one dependent variable can be used in any given analysis, however, the number of allowable independent variables is unlimited. The primary purpose of regression is to get the best possible prediction of the dependent measure (Astin, 1991; Hinkle, 1988; SYSTAT, 1990). The generic mathematical formula for multiple regression is represented as follows: \( Y = b_1X_1 + b_2X_2 + \ldots + b_kX_k + a \), where the \( b \)'s are the
regression coefficients for the respective predictor variables (X's) and a is the regression constant (Hinkle, 1988).

Astin uses multiple regression in his model. Some statisticians do not recommend the use of multiple regression with dummy or dichotomous dependent variables, rather they suggest using either discriminant analysis or logit analysis. Dey and Astin found that regression was preferable over discriminant or logit analysis unless the split between 1's and 0's on the dependent variable was extreme (90% to 10%) (Astin, 1991).

In this study, successful students (as defined by having at least a 2.0 GPA, having completed at least half the hours attempted, and self assessing having met their goals or making progress toward their goals) made up 70% of the sample, while nonsuccessful students (not meeting the above three criteria) comprised 30% of the sample. Because these proportions were closer than 90/10 multiple regression was judged to be an acceptable statistical procedure for the dichotomous dependent variable. Astin used the same procedure in his analysis of retention (also dichotomous).

Stepwise multiple regression was the specific regression methodology employed by Astin in his benchmark studies of the I-E-O model. For this reason, the same methodology was used in this study. In the stepwise method predictor variables are entered one at a time but can be deleted if they do not contribute significantly to the regression when considered in combination with newly entered predictors (Hinkle, 1988). Although stepwise multiple regression is a popular method employed in social science research, Kerlinger, Cliff, and Pedhazur (Thompson, 1989) caution that this particular methodology can lead to Type I errors.
and misinterpretation. Consequently, this study utilized the formula to estimate the shrinkage of $R^2$ as outlined by Pedhazur (1982) and tested the significance of the change of the adjusted $R^2$ after each step in the regression.
CHAPTER IV. RESEARCH RESULTS

The research results and data analysis presented in this chapter were based on data collected from NIACC permanent student records, NIACC registration records, NIACC admission applications, and the ACT Student Opinion Survey - 2 year college form. The study sample consisted of 1,019 students who first attended NIACC in the Fall semester of 1991. All first time attendees who enrolled for one or more semester credit hours were included. The ACT Student Opinion Survey was administered in April, 1992. A total of 434 students returned the survey for a return rate of 43%.

The results of research and hypothesis testing are presented in the remainder of this chapter. Subsections include: description of the data collected; findings of the hypotheses; and a general summary.

Descriptive Statistics

This section provides an estimate of the nature of the population in this study. Table 3 presents general demographic information concerning the 434 respondents to the ACT survey. It can be noted that although a majority of the respondents are traditional aged, white, full time, day students; a sizable minority do not fit the traditional student model. This is especially true for age (18.4% are 26 or over) and educational goal (22.3% had no diploma, degree, nor transfer to a four year college aspirations). In addition, with 71.4% of the students commuting, dormitory residents are a minority of the students.
Table 3. Student characteristics of ACT survey respondents

<table>
<thead>
<tr>
<th>Variable</th>
<th>25 and Under</th>
<th>26 and over</th>
<th>Did not respond</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGE</td>
<td>N= 352</td>
<td>80</td>
<td>2</td>
<td>434</td>
</tr>
<tr>
<td></td>
<td>%= 81.1</td>
<td>18.4</td>
<td>0.5</td>
<td>100</td>
</tr>
<tr>
<td>RACE</td>
<td>N= 413</td>
<td>12</td>
<td>9</td>
<td>434</td>
</tr>
<tr>
<td></td>
<td>%= 95.2</td>
<td>2.7</td>
<td>2.1</td>
<td>100</td>
</tr>
<tr>
<td>GENDER</td>
<td>N= 184</td>
<td>247</td>
<td>3</td>
<td>434</td>
</tr>
<tr>
<td></td>
<td>%= 42.4</td>
<td>56.9</td>
<td>0.7</td>
<td>100</td>
</tr>
<tr>
<td>FULL TIME/PART TIME</td>
<td>N= 378</td>
<td>45</td>
<td>11</td>
<td>434</td>
</tr>
<tr>
<td></td>
<td>%= 87.1</td>
<td>10.4</td>
<td>2.5</td>
<td>100</td>
</tr>
<tr>
<td>TIME OF CLASSES</td>
<td>N= 392</td>
<td>38</td>
<td>4</td>
<td>434</td>
</tr>
<tr>
<td></td>
<td>%= 90.3</td>
<td>8.8</td>
<td>0.9</td>
<td>100</td>
</tr>
<tr>
<td>RESIDENCE</td>
<td>N= 102</td>
<td>310</td>
<td>22</td>
<td>434</td>
</tr>
<tr>
<td></td>
<td>%= 23.5</td>
<td>71.4</td>
<td>5.1</td>
<td>100</td>
</tr>
<tr>
<td>ON/OFF CAMPUS CLASSES</td>
<td>N= 403</td>
<td>18</td>
<td>13</td>
<td>434</td>
</tr>
<tr>
<td></td>
<td>%= 92.8</td>
<td>4.2</td>
<td>4.0</td>
<td>100</td>
</tr>
<tr>
<td>EDUCATIONAL GOAL</td>
<td>N= 330</td>
<td>97</td>
<td>7</td>
<td>434</td>
</tr>
<tr>
<td></td>
<td>%= 76.1</td>
<td>22.3</td>
<td>1.6</td>
<td>100</td>
</tr>
</tbody>
</table>
Community colleges have a variety of majors in both college transfer and vocational areas. NIACC offers vocational programs in clerical, marketing distribution, health, trade and industry, and agriculture. A list of majors reported by respondents can be found in Table 4. Approximately 30% of the respondents were vocational students.

Table 4. Majors reported by survey respondents (N=434)

<table>
<thead>
<tr>
<th>MAJOR</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lib. Art/Undecided</td>
<td>61</td>
<td>14.1</td>
</tr>
<tr>
<td>Agriculture</td>
<td>21</td>
<td>4.8</td>
</tr>
<tr>
<td>Business/Mgmt</td>
<td>69</td>
<td>15.9</td>
</tr>
<tr>
<td>Business/Clerical</td>
<td>31</td>
<td>7.1</td>
</tr>
<tr>
<td>Marketing Distrib.</td>
<td>18</td>
<td>4.1</td>
</tr>
<tr>
<td>Communications</td>
<td>2</td>
<td>.5</td>
</tr>
<tr>
<td>Community Serv.</td>
<td>32</td>
<td>7.4</td>
</tr>
<tr>
<td>Education</td>
<td>45</td>
<td>10.4</td>
</tr>
<tr>
<td>Engineering</td>
<td>28</td>
<td>6.4</td>
</tr>
<tr>
<td>Health Science</td>
<td>57</td>
<td>13.1</td>
</tr>
<tr>
<td>Home Economics</td>
<td>1</td>
<td>.2</td>
</tr>
<tr>
<td>Mathematics</td>
<td>2</td>
<td>.5</td>
</tr>
<tr>
<td>Science</td>
<td>6</td>
<td>1.4</td>
</tr>
<tr>
<td>Social Science</td>
<td>29</td>
<td>6.7</td>
</tr>
<tr>
<td>Trade &amp; Industry</td>
<td>11</td>
<td>2.5</td>
</tr>
<tr>
<td>Fine Arts</td>
<td>5</td>
<td>1.2</td>
</tr>
<tr>
<td>Did not respond</td>
<td>16</td>
<td>3.7</td>
</tr>
</tbody>
</table>

The total population of first time NIACC students for the fall of 1992 (N=1019) had similar, although not identical characteristics. The Student Opinion Survey respondents were slightly overrepresented by females (57% of the respondents compared to 53% of the total population); whites made up 95% of the total population as well as 95% of the respondents. Table 5 shows a summary of gender
and race demographic information of the entire population compared to those who
returned the survey. No significant differences between the two groups were found.
Respondents had a slightly higher mean GPA than the total population, 2.595 for
respondents compared to 2.503 for the population. The mean age of respondents
was 22.8, slightly below the 24.8 average of the population.

Table 5. Comparison of gender and race of survey respondents to total population
(N=1019)

<table>
<thead>
<tr>
<th></th>
<th>Survey</th>
<th>Population</th>
<th>z score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>247</td>
<td>536</td>
<td>1.3999</td>
</tr>
<tr>
<td>Male</td>
<td>184</td>
<td>483</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>431</td>
<td>1019</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>413</td>
<td>969</td>
<td>.0566</td>
</tr>
<tr>
<td>Other than white</td>
<td>21</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>434</td>
<td>1019</td>
<td></td>
</tr>
</tbody>
</table>

Critical value of z for .05 significance level = 1.96

Hypothesis I

The first research question explored in this study was: Which incoming
student characteristics, if any, have an impact on student success? The null
hypothesis addressing this question was: There is no significant relationship
between incoming student characteristics and student success. Alpha was set at .05.
Due to non-responses on certain survey questions the number of usable surveys in
this analysis was 316. Regression using student success as the dependent variable
and age, gender, prior academic achievement, race, educational goal, socio-economic
status, and personality type as the independent variables was performed.
Analysis using forward stepwise regression yielded the following results. Six of the independent variables were found to have significant predictive power for student success. High prior academic achievement, race, age, and the "thinking" function of the Thinking/Feeling scale on the MBTI had positive correlations to student success, while gender and high socio-economic status had negative correlations. Borderline achievement, educational goal, and the other three MBTI scales (Extravert/Introvert, Sensing/Intuition, and Judging/Perceiving) failed to enter the equation. Table 6 shows the results of the last step of this regression. The test for the significance of the change of adjusted $R^2$ showed significance in change for each step.

Approximately 16% of student success can be accounted for by the six variables that entered the equation. It can be concluded that many incoming student characteristics play a part in student success. The null hypothesis, that there is no significant relationship between incoming student characteristics and student success, was rejected since there were at least six characteristics which significantly contributed to student success.

Examining the information in a slightly different format can highlight additional relationships, especially suppressor effects. There are two situations when using multiple regression that suppressor effects can be observed. When two independent variables have the same relationship (both positive or both negative) with the dependent variable and a negative relationship with each other a suppressor effect takes place. Also, when the two independent variables have opposite relationships (one positive and one negative) with the dependent variable
Table 6. Stepwise multiple regression analysis for incoming student characteristics

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>r</th>
<th>Beta</th>
<th>F</th>
<th>p</th>
<th>R²</th>
<th>Adj R²</th>
<th>Change</th>
<th>F of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI ACHIEVEMENT</td>
<td>.194</td>
<td>.221</td>
<td>17.235</td>
<td>.000</td>
<td>.037636</td>
<td>.0028137</td>
<td></td>
<td>10.12**</td>
</tr>
<tr>
<td>ETHNICITY</td>
<td>.173</td>
<td>.188</td>
<td>12.785</td>
<td>.000</td>
<td>.068644</td>
<td>.0349437</td>
<td>.03213</td>
<td>10.10**</td>
</tr>
<tr>
<td>AGE</td>
<td>.137</td>
<td>.141</td>
<td>6.878</td>
<td>.009</td>
<td>.098596</td>
<td>.0659795</td>
<td>.0310385</td>
<td>7.54**</td>
</tr>
<tr>
<td>GENDER</td>
<td>-.185</td>
<td>-.222</td>
<td>14.841</td>
<td>.000</td>
<td>.120409</td>
<td>.0885818</td>
<td>.0226023</td>
<td>7.70**</td>
</tr>
<tr>
<td>MBTI3-THINKING</td>
<td>.048</td>
<td>.167</td>
<td>8.377</td>
<td>.004</td>
<td>.142129</td>
<td>.1110825</td>
<td>.0225007</td>
<td></td>
</tr>
<tr>
<td>HI SES</td>
<td>-.112</td>
<td>-.127</td>
<td>5.739</td>
<td>.017</td>
<td>.158404</td>
<td>.1279516</td>
<td>.0171266</td>
<td>5.97*</td>
</tr>
</tbody>
</table>

*.05 level of significance
**.01 level of significance
Table 7. Suppressor effects of incoming student characteristics (N=316)

<table>
<thead>
<tr>
<th>STEP</th>
<th>VARIABLE</th>
<th>R</th>
<th>Simple r</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Entering:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>HIACHV</td>
<td>194</td>
<td>194</td>
<td>197</td>
<td>226</td>
<td>212</td>
<td>215</td>
<td>221</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>ETHNIC</td>
<td>262</td>
<td>173</td>
<td>177</td>
<td>178</td>
<td>169</td>
<td>179</td>
<td>188</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>AGE</td>
<td>314</td>
<td>137</td>
<td>175</td>
<td>166</td>
<td>161</td>
<td>141</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>GENDER</td>
<td>347</td>
<td>-185</td>
<td>-149</td>
<td>-217</td>
<td>-222</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5</td>
<td>MBTI3</td>
<td>377</td>
<td>048</td>
<td>163</td>
<td>167</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>SESHI</td>
<td>398</td>
<td>-112</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Decimals before numbers have been omitted.

and a positive relationship with each other this effect takes place. Table 7 illustrates where suppressor effects can be found in this equation.

In most situations, standardized coefficients tend to get smaller after each step in stepwise regression analysis. The reason for this is that independent variables tend to be correlated (Astin, 1992, p.289). When standardized coefficients increase it signals a suppressor effect. There are a number of suppressor effects evident. The first effect is noticeable between race and high prior academic achievement. Race of students had negative correlation with prior academic achievement but a positive correlation with student success. High prior academic achievement also has a negative correlation with age and with the "thinking" personality characteristic, while it had a positive correlation with high socio-economic status.

The race of the student had negative correlation with high academic achievement, age, "thinking" characteristic, and socio-economic status. Gender, although negatively correlated with student success is positively correlated with the
"thinking" function and socio-economic status. Finally, MBTI "thinking" and socio-economic status are positively correlated although socio-economic status is negatively correlated with student success.

Hypothesis 2

The second research question addressed in this study was: After controlling for incoming student characteristics, what relationship, if any, do college environment variables have with student success? The null hypothesis was: After controlling for incoming student characteristics, there is no significant relationship between college environment variables and student success. Alpha was set at .05. The number of usable cases in this analysis was 293. The independent variables for incoming characteristics were the same as those used for testing Hypothesis 1. Environmental independent variables consisted of full time/part time attendance, on/off campus classes, dormitory/commuter residence, involvement, major, general satisfaction with the college, and goal congruence.

Three separate methods of using stepwise regression were employed. The first procedure forced all eleven incoming student characteristics in to the equation then allowed for the entry of environmental variables into the equation. The second method forced the six significant incoming variables into the equation then allowed for the entrance of other variables. The third method allowed for the entrance of all eighteen variables with no forced variables. All three results yielded only one environmental variable entering the equation. The same six incoming student characteristics were found to have significant predictive power for student success.
Table 8. Stepwise multiple regression analysis for incoming student characteristics and college environment

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>r</th>
<th>Beta</th>
<th>F</th>
<th>p</th>
<th>R^2</th>
<th>Adj R^2</th>
<th>Change</th>
<th>F of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENDER</td>
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<td>-.250</td>
<td>16.398</td>
<td>.000</td>
<td>.036481</td>
<td>-.0268158</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HI ACHIEVEMENT</td>
<td>.184</td>
<td>.222</td>
<td>15.362</td>
<td>.000</td>
<td>.067081</td>
<td>.0057944</td>
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*.05 level of significance
**.01 level of significance
(high prior academic achievement, race, age, the “thinking” function of the MBTI Thinking/Feeling scale, gender, and high socio-economic status). Only one environmental characteristic entered the equation; goal congruence. Table 8 shows the final step in the regression using the third procedure when no variables were forced into the equation.

It should be noted that goal congruence had a negative effect on student success, as did high socio-economic status and gender. However, since goal congruence was significant the null hypothesis was rejected. R squared increased from approximately 16% to almost 19%. Again in cross-validation, all steps showed a significant change in R squared.

Table 9 examines the suppressor effects of the second regression analysis. Additional effects are seen with environmental variables and incoming characteristics.

Table 9. Suppressor effects using incoming student characteristics and college environment variables (N=293)

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</table>

NOTE: Decimals before numbers have been omitted.
Again, there are numerous suppressor effects in evidence in Table 9. Gender has positive correlations with MBTI "thinking"; and negative correlations with high socio-economic status and goal congruence. High achievement corresponds positively to high socio-economic status and goal congruence, but negatively to age, race, and MBTI "thinking". Age and race have negative correlations. Race also has negative relationships with MBTI "thinking" but positive correlations with high socio-economic status and goal congruence. The MBTI thinking function has a positive correlation to high socio-economic status; high socio-economic status has a positive correlation to goal congruence.

Hypothesis 3

The final research question asked in this study was: What relationship, if any, do specific incoming student characteristics have with college environment variables? The null hypothesis for this question is: There is no significant relationship between incoming student characteristics and college environment variables. Alpha was set at .05. The number of respondents who had scores for all eighteen variables (input and environmental) was 270. A correlation matrix was constructed using all previously identified incoming student characteristics (11) and college environment variables (7). Table 10 shows significant correlations between the incoming characteristics and college environment variables.

Age was the incoming student characteristic that evidenced the largest number of relationships with environmental variables as well as the highest correlations with those variables. The null hypothesis that there is no significant
Table 10. Correlations of incoming student characteristics with college environment variables

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<th>B ACHIEVE</th>
<th>RACE</th>
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<th>MBTI2</th>
<th>MBTI3</th>
<th>MBTI4</th>
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* .05 level of significance
** .01 level of significance
*** .001 level of significance

The relationship between incoming student characteristics and college environment variables was rejected.

Summary

Three research questions were addressed in this chapter:

1. Which incoming student characteristics, if any, have an impact on student success?

2. After controlling for incoming student characteristics, what relationship, if any, do college environment variables have with student success?

3. What relationship, if any, do specific incoming student characteristics have to college environment variables?

Null hypotheses were then derived from these questions:

1. There is no significant relationship between incoming student characteristics and student success.
2. After controlling for incoming student characteristics there is no significant relationship between college environment variables and student success.

3. There is no significant relationship between incoming student characteristics and college environment variables.

The first two hypotheses were tested using multiple regression. Additional information was gathered by examining suppressor effects between the various characteristics. Six incoming student characteristics were shown to have a significant relation to student success. Those six characteristics were high academic achievement, race, age, gender, the "thinking" scale on the MBTI, and high socio-economic status. Gender and high socio-economic status had a negative relationship with success. One environmental variable entered the regression equation, goal congruence. The relationship was negative. Both null Hypothesis 1, and null Hypothesis 2 were rejected.

Hypothesis 3 used a correlation matrix to test for possible relationship between incoming student characteristics and college environment variables. Age had the greatest number and largest correlations to environmental variables. Age was positively correlated with full/part time student status, student involvement, and major; and negatively correlated with general satisfaction and dorm residence. Other student characteristics which correlated to environmental variables included high achievement negatively to both general satisfaction and dorm residence; and extravert which correlated positively with dorm residence and location of class. Again, the null hypothesis was rejected. Chapter V. will discuss these findings in more detail and will offer conclusions and recommendations.
CHAPTER V. CONCLUSIONS AND RECOMMENDATIONS

This final chapter is divided into three parts. Part one gives an overview of the study and a summary of the findings; part two examines conclusions and the import of those conclusions; and, part three offers recommendations for further research.

Overview

This study was designed to identify the incoming student characteristics and college environment variables that predict student success in order to ascertain to what extent NIACC was meeting its Access and Equity goal and to determine possible corrective actions. North Iowa Area Community College’s Access and Equity goal is, to ensure that all citizens of the North Iowa region; regardless of their educational and socio-economic backgrounds, geographic placement, or needs for special assistance, have the opportunity and the necessary support to successfully take advantage of post-secondary educational programs and other services offered by the college.

Using the I-E-O model developed by Alexander Astin, the researcher investigated input variables of academic achievement at the time of enrollment, gender, race, age, socio-economic status, purpose for enrolling, and personality type. Additional independent variables classified as environmental variables included full or part time attendance, on or off campus classes, commuter or dormitory residence, major area of study, student involvement, goal congruence, and student satisfaction. Student success was measured by cumulative grade point average, ratio of semester
hours attempted to semester hours earned, and student perception of successful goal attainment or progress.

Three research questions were formulated:

1. Which incoming student characteristics, if any, have an impact on student success?

2. After controlling for incoming student characteristics, what relationship, if any, do college environment variables have with student success?

3. What relationship, if any, do specific incoming student characteristics have to college environment variables?

Null hypotheses were then derived from these questions:

1. There is no significant relationship between incoming student characteristics and student success.

2. After controlling for incoming student characteristics there is no significant relationship between college environment variables and student success.

3. There is no significant relationship between incoming student characteristics and college environment variables.

Student success was purposely chosen for the outcome because it was thought to be more pertinent for diverse community college students than retention or persistence which were traditionally used in similar studies. Trying to define and measure retention or persistence for students who come for a specific class, or to learn a specific skill, or stop out every fall to work and attend every spring, or stay just long enough to earn money to transfer to another school, is not the most applicable method of measuring effectiveness.

As reported in Chapter I (Alfred, 1992; Doucette & Hughes, 1990) student success has become a fundamental focus of community college effectiveness research. This determination is much more appropriate when gauging a community
college's effectiveness than how many students graduate, without knowing how many students had any intention of graduating. Because NIACC's Access and Equity goal specifically addresses the opportunity and necessary support to successfully take advantage of post-secondary educational programs and services, success rather than persistence was determined to be the appropriate outcome. Alfred (1992), Doucette & Hughes (1990), and Adelman (1992) support this outcome as an indicator of institutional effectiveness for community colleges.

The population for this study consisted of all first time enrollees at North Iowa Area Community College (NIACC) for the Fall 1991 semester (N=1019). Data were derived from NIACC registration records, NIACC permanent records, student admissions applications, MBTI, Form G self scorable personality assessment instrument, and the ACT Student Opinion Survey - 2 year college form.

The MBTI was administered during orientation as part of new student assessment at the time of enrollment. The ACT Student Opinion Survey was administered in April, 1992. Surveys were administered in Communication Skills classes, vocational classes, night classes, and off-campus classes. Surveys were mailed to students no longer attending NIACC. A total of 434 students completed and returned surveys for a return rate of 43%.

Data were analyzed by a two level procedure using both descriptive and inferential statistics. Descriptives included count, percentages, mean and standard deviations as applicable. Inferential analysis included multiple regression and Pearson correlation.

Demographic data showed that the majority of the respondents were traditional aged, white, full time, degree oriented, day, commuting students.
However, a sizable minority (20% or more) were adult, had no aspiration for a degree, and lived in the dormitories. A comparison between the entire population (N=1019) and the survey respondents yielded no significant (.05) difference in age, race, gender, or GPA. Therefore, it was determined that the sample was representative of the population.

Conclusions

Hypothesis 1

Hypothesis 1 testing produced the following results. Six incoming student characteristics entered the multiple regression formula and were found to have significant predictive power for student success. High prior academic achievement, race, age, and the "thinking" function of the MBTI Thinking/Feeling scale had positive correlations with student success; gender and high socio-economic status had negative correlations. The null hypothesis was rejected as there were six variables which were significantly related to student success.

High prior academic achievement has traditionally been a primary factor in student success, student persistence, and student retention studies (Astin, 1975; Von Destinon, 1988; Webb, 1989). This research supported previous findings. High prior academic achievement exhibited the highest correlation with student success. Race was not found to be significant in the studies reviewed in Chapter II (Astin, 1975; Stoecker, 1988; Williamson & Creamer, 1988; Webb, 1989; Voorhees, 1987); however, it proved to have a significant effect (.05 level) in this study using student success rather than retention or persistence as the outcome. Contrary to Astin's findings (1975), age and being female were positive factors in community college
student success as opposed to negative factors in retention. As expected from previous research discussed in Chapter 2 (Provost & Anchors, 1987), the "thinking" function of the MBTI Thinking/Feeling scale was positively correlated with student success.

The negative correlation between high socio-economic status and student success was unexpected. One possible explanation is that students from families of high socio-economic status who had acceptable prior academic achievement would be more likely to attend a four year college or university, while those with lower achievement who could not gain acceptance at competitive colleges would be more apt to attend the open door community college. Thus, students from high socio-economic backgrounds might be more apt to attend community college because of academic difficulties rather than financial or other considerations.

A second possible explanation is that the majority of students qualifying as high socio-economic status (based on parents' education level and non-eligibility for financial aid) were traditional aged students. These younger students did not have as great a degree of success as adult students. Many adult students would not have qualified as high socio-economic status because their parents did not attend college. Therefore, age could have had an interactive influence in the relationship between socio-economic status and student success.

When examining the data for suppressor effects, the following phenomena were observed. The first effect was found between race and high prior academic achievement. Race of students had negative correlation with prior academic achievement but a positive correlation with student success. High prior academic achievement also has a negative correlation with age and with the "thinking"
personality characteristic, while it had a positive correlation with high socio-economic status. However, the only correlation between the input characteristics which was significant at the .05 level was the negative correlation between age and high prior academic achievement.

The ethnicity of the student had negative correlation with high academic achievement, age, "thinking" characteristic, and socio-economic status. Gender, although negatively correlated with student success is positively correlated with the "thinking" function and socio-economic status. Finally, MBTI "thinking" and socio-economic status are positively correlated although socio-economic status is negatively correlated with student success. None of the correlations observed here were significant except the "thinking"/gender relationship.

One possible explanation for the significant suppressor effect between age and high prior academic achievement is that older students usually have had a longer hiatus between school and college. Consequently, they may have forgotten necessary information for performing well on academic tests. They might also lack practice in test taking thus needing more time to perform (NIACC's assessment tests are timed). Additionally, many of the adults who are first time enrollees in college did not enjoy school as teens and did not perform well in high school. As adults, they many times attend college with stronger motivations and the desire to do well. This increased determination to succeed can have a greater impact than prior achievement.

The "thinking"/gender relationship has been reported in most MBTI results. Approximately 60% of males score on the "thinking" side of the MBTI Thinking/Feeling scale, while 35% of females score on the "thinking" side (Myers &
McCaulley, 1988). Thus, we would expect the "thinking"/gender relationship to be positive. Women, on the other hand, tend to do better in the college classroom (as evidenced by the negative correlation between gender and student success), which accounts for the suppressor effect.

The results from Hypothesis 1 indicate subgroups that NIACC needs to pay particular attention to when designing support systems. For example, minority students, traditional aged students, and students who prefer the "feeling" function on the MBTI would appear to be at a disadvantage coming in to NIACC; therefore, it would behoove NIACC to offer special support to those students in order to counteract the disadvantage they enter with. For adults, one possible adjustment NIACC might make would be to offer practice tests and/or test taking seminars for adults prior to entrance assessment. Brush-up seminars offered in the summer might also prove to be valuable to adult students.

Approximately 50% of the minority students attending NIACC live in the dormitory. This proportion is much higher than that of the general NIACC population (less than 15% live in the dorms). Students living in the dorms generally do not have access to family support within the area. Therefore, NIACC might better serve the minority population (as well as other dorm residents) by offering a mentor program or other support program where dorm students would have a person to consult or relate to in the community or at the school. In addition, a minority or crosscultural club would possibly assist commuting and dorm minority students to more fully integrate into campus life.

Students with a preference for "feeling" on the MBTI might be better served by offering support groups where students could interact informally to get some of their
affiliation needs met. NIACC might also offer seminars on "How to survive in a 'T' world." Because the majority of people who have a "feeling" preference are women, a women's center and/or women's group could offer assistance.

Hypothesis 2

Analysis using forward stepwise regression yielded the following results for Hypothesis 2. The same six incoming student characteristics were found to have significant predictive power for student success (high prior academic achievement, race, age, the "thinking" function of the MBTI Thinking/Feeling scale, gender, and high socio-economic status). Only one environmental characteristic entered the equation; goal congruence. However, since this one environmental variable was significant, the null hypothesis was rejected.

It is interesting that the only significant environmental variable for student success was negatively correlated. Previous research has documented a positive relationship between student success and college goal congruence (Alfred, 1992). One possible explanation for this discrepancy is that goal congruence in this study used a cumulative score where congruence was tested between ten different goals expounded by the college.

Successful students might have one or two goals which closely resemble the college goals but eight or nine goals that they are not interested in, yet recognize that those goals might be important to the college. This would result in a large total goal discrepancy. Conversely, students who are less successful might be less inclined to assign different degrees of importance to their own goals and the college's goals (If it's important to me, it must be important to others; if it's not important to me, it can't be important to others). Again, age might have had an influence in that
many times adults can view a situation more objectively and might recognize legitimate discrepancies between personal goals and institutional goals more readily than young students. A different instrument or method of measuring goal congruence might be more conclusive.

Again, there were numerous suppressor effects in evidence in the second hypothesis. Gender had positive correlations with MBTI "thinking"; and negative correlations with high socio-economic status and goal congruence. High achievement corresponded positively to high socio-economic status and goal congruence, but negatively to age, race, and MBTI "thinking". Age and race had negative correlations. Race also had a negative relationship with MBTI "thinking" but positive correlations with high socio-economic status and goal congruence. The MBTI thinking function had a positive correlation to high socio-economic status; high socio-economic status had a positive correlation to goal congruence. The only significant correlation between the variables observed in this hypothesis not reported in the first hypothesis was the relationship between socio-economic status and goal congruence.

The positive relationship between high socio-economic status and goal congruence, as well as the negative relationship of both of these to student success is more difficult to postulate. One possible explanation for the positive relationship between high socio-economic status and goal congruence is that if (as Astin postulates [1975]) more educated parents exert pressure on students to attend college, then high socio-economic students (identified in this study by parents' education levels and lack of need based financial aid) might well have been exposed to values similar to the college goals. This might account for the relationship
between socio-economic status and goal congruence, but does not help to explain their negative relationship to success.

The lack of other environmental variables having predictive power for student success can be viewed from a number of perspectives. Those with a positive perspective might well recognize the impact of diversity on outcomes in a study of community colleges. If there is no significant difference in student success between full time and part time students, then the conclusion that both types of students are being served equitably is possible. What then becomes pertinent is to examine specific sub-groups of the population to discover a best practices approach to various groups attending the community college. For example, involvement might well have a greater effect on traditional aged dormitory residents than on adult commuters. That effect could be explored and then programming could be instituted to directly focus on the dorm student. A different perspective might be - it doesn’t matter what the college does, student success depends on what the student brings to college, so the status quo is appropriate and there is no need to change.

Certainly, the results from Hypothesis 2 confirm Astin’s contention that looking only at environment and outcome without taking incoming student characteristics into account biases the data. The results would also tend to uphold community college wisdom that diverse subgroups need different services; that one set way of doing things for all students (providing a similar environment for all) could well be counter-productive. NIACC must examine the differences in subgroups more thoroughly to target the specific environmental needs of each group.
Hypothesis 3

The analysis of the third hypothesis examined the relationship between incoming student characteristics and college environment variables. Age had the greatest impact on environmental variables and was positively correlated with full/part time student status, borderline achievement, involvement, and major; and negatively correlated with general satisfaction and dormitory residence. More adults were part time, were highly involved, and had vocational majors. Fewer adults lived in the dormitories. Also, fewer adults were generally satisfied with the college. This might help to explain one reason that general satisfaction did not enter the multiple regression equation in Hypothesis 2.

Adults in the NIACC service area, for the most part, are place bound and attend college for a specific purpose. If their motivation to obtain their goal is strong, they may do that without being particularly satisfied with their college environment; i.e. they see the community college as their only recourse in reaching their goal, and they are willing to put up with some dissatisfaction to reach that goal. Younger students might be more apt to drop out or attend a different college if they were not satisfied.

High prior academic achievement had significant negative correlations with general satisfaction, the "intuitive" function of the Sensing/Intuition scale on the MBTI, and dorm residence. Being an "extravert" (MBTI extravert/introvert scale) had positive correlations with dorm residence and location of classes. Extraverts were more likely to attend class on campus; this is at least partly explainable by the small class sizes off-campus; those who do not feel comfortable in larger classes might well opt for the smaller off-campus classes. Also, students who do not feel
comfortable living with a large group of people in a high noise level environment would probably choose to live in an apartment or at home rather than in the dorms. Implications for this outcome would be for NIACC to look into how certain areas or floors of the dormitory might be made more conducive to introverted students. Quiet floors, single rooms, and small lounges would generally appeal to introverted students.

The negative correlation between high prior academic achievement and dormitory residence might be due to the possibility that those who live too far away to commute would probably choose a four year college or university to attend if they had high academic achievement, or they might attend a community college within commuting distance if finances were a difficulty. High prior achievement and negative satisfaction results might be accountable for by the lack of honors classes, or lack of challenge, but without further research these are only the researcher's supposition. The negative correlation between high prior academic achievement and the "intuitive" function was unexpected since most "intuitives" do well on standardized tests (Provost & Anchors, 1987).

Access and Equity

Astin's I-E-O model was used to incorporate variables judged to be important for NIACC's assessment of its Access and Equity goal. This model proved to be an appropriate framework to examine general relationships between student characteristics and college environmental characteristics, as they relate to student success. It did not, however, in itself give a comprehensive picture. It was helpful in identifying subgroups that were not predictive of success, thus being useful in deciding which groups to target. However, it might be more definitive to look at the
environmental variables' effects for each subgroup rather than the entire population, or in addition to the entire population. The same result could be gained by using crosstabs after the model identified which subgroups and environmental characteristics warranted further study. The suppressor effects are also helpful in this determination.

In evaluating NIACC's goal of Access and Equity, the conclusion is supported that NIACC does provide access to the people of North Iowa. The continued growth and increasing diversity of the student body provide support for this conclusion. Equity, which includes the effectiveness of the institution in assisting students to be successful, is not as strongly supported by the outcomes of this research. With only 70% of the students surveyed qualifying as successful, the message that not all students are experiencing success is clear.

It would appear that NIACC is doing an admirable job in meeting the needs of certain subgroups, but could improve in meeting other group's needs. The need for further determination of which college environmental variables impact specific subgroups is apparent. The conclusion can be drawn that college services are meeting various needs of students (none were strongly negatively correlated), but that no one service meets the needs of all groups. Therefore, what NIACC is called to do is to address the diversity of its student population by a variety of services. The object is to determine which subgroups would benefit by each service and how to best deliver those services.

Recommendations
Each of the preceding conclusions suggests further research studies. Conclusions from the first hypothesis which warrant further research would include a closer look at the negative correlation between age and high prior academic achievement to determine the potential cause(s). One possible method might be to use qualitative analysis with a case study approach among the same students used in this study. The same methodology could be used in examining the negative correlation between high socio-economic status and student success.

The discrepancy between goal congruence and student success in the second hypothesis would be a viable study. The entire area of goal congruence and community college students would benefit from further research. Another area for investigation suggested by this hypothesis is whether different environmental variables have different effects on sub-groups of the college population. Concrete applications for improved service from the college perspective might well be a result of being able to isolate specific needs of different sub-groups.

The third hypothesis yields suggestions for research to determine what actions students take when they are not satisfied with the college, especially nontraditional students and students with high prior academic achievement. It would also be informative to ascertain what factors increase student satisfaction.

Other specific suggestions for further research would include: 1) A comparative study with other community colleges; 2) A longitudinal study at NIACC using incoming students for a yearly survey; 3) A comparison between retention and student success, using the same incoming student characteristics and college environment variables with the same population; and 4) A longitudinal study of the population studied in this research.
Similar investigations incorporating other community colleges would provide comparative data. Ultimately, the findings from other community colleges would aid the findings of the present investigation by determining the similarity or dissimilarity to community colleges in general. There might well be differences between urban, metropolitan, and rural community colleges; or between large and small colleges.

Continuing a yearly (or periodic) survey with incoming NIACC students would help to establish a baseline for further research and could be used in trend studies. Trend studies might be useful for the establishment of new programs and improved evaluation methods.

Comparing retention and student success with the same subjects and variables with only the outcome variable different could give a clear picture of how misleading the use of retention rather than student success can be for community college studies. In addition, doing follow-up research using the same population that was included in this study would allow for the gathering of information such as whether satisfaction and/or goal attainment differed after two years of attendance or after attending another institution of higher education. All of the above studies would add to the body of literature concerning community colleges and would increase the knowledge associated with the largest provider of higher education.
REFERENCES


Noel, L. & Levitz, R. (1990). National dropout rates freshman to sophomore year by type of institution. ACT Institutional Data File, 1989 for the National Center for the Advancement of Educational Practices. Iowa City, IA.


ACKNOWLEDGEMENTS

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It would be almost impossible to name all those at North Iowa Area Community College who assisted me in a myriad of ways to bring this research to fruition, however, I would be remiss not to mention at least the key players. First, my thanks to Dr. David Buettner, president of NIACC who was supportive of this institutional research project and provided the necessary college resources. Dr. Michael Morrison, Mark Greenwood, Linda Beier, and Janice Christensen were invaluable in offering technical assistance in computer programming, data manipulation, and data processing. Dr. Jean Goodnow, Ann Morrison (Tucki) Folkers, Jean Stocks, Marty Lundberg, and Karmen Shriver provided assistance in questionnaire development and critique, as well as providing support and encouragement at every step in the process. Thanks to you all, and to the entire NIACC staff for their cooperation in administering surveys.

Finally, I would like to thank my son Joshua and my daughter Anastasia who spent most of their growing years with a parent in school. Thanks for understanding when I couldn’t attend a school function because I had class, and when we couldn’t go on vacation because I had summer school, and why it was more
important to pay tuition than to buy designer jeans. I hope for you both a lifelong love of learning.
APPENDIX A

STUDENT OPINION SURVEY
PLEASE NOTE

Copyrighted materials in this document have not been filmed at the request of the author. They are available for consultation, however, in the author's university library.

Appendix A, 95-102

University Microfilms International
## CAREER PROGRAMS

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227 Theater
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766 Veterinarian
Dear NIACC Student:

It's your turn to grade NIACC! You've spent the last nine months being graded and evaluated by your instructors - now we'd like you to tell us how we are doing. NIACC is in the process of a self-study to determine how well it is meeting its mission and goals. A vital part of this study is to get information and feedback from students. We are asking that you assist us in our project by filling out the enclosed survey.

The survey should take approximately 20 minutes to complete. Please use a #2 lead pencil. You are asked to fill in your Social Security number so that we can make sure that all students who enrolled at NIACC in the Fall of 1991 for the first time have an opportunity to provide us with feedback. Your Social Security number will be used for research purposes only, and will not be used or listed on any report. All data will remain confidential and results will be reported in group form only.

If there are any questions on the survey that you choose not to answer, you may omit them; however, the more complete the questionnaires are the more usable data we will have. If you choose not to answer any of the questions, please fill out at least your Social Security number so that we do not contact you again. Non-participants will not be penalized in any way.

Thank you for your assistance and cooperation in our attempt to make NIACC even better. We believe that the information you provide will give us valuable insight into what we can do to assist you and other students in being successful here.

In addition to using results from this survey in our institutional effectiveness effort, the results will be used in a doctoral dissertation by Sue Norton, NIACC counselor. Survey answers will be correlated with information such as assessment scores, grade point average, hours attempted, hours completed, and major program of study. If you have not taken the Myers Briggs Personality Assessment (MBTI) during Orientation or in a class you may also be asked to fill out that instrument. Again, all data will remain confidential and be reported in group form only.

If you have any questions or concerns about this survey or the self-study, please contact Sue Norton at the Counseling Center. She can be reached by phone at 421-4365 or 1-800-392-5685.
TO: NIACC Instructors

FROM: Sue Norton

DATE: March 23, 1992

RE: Student Opinion Survey

You may recall that last fall we discussed the administration of a Student Opinion Survey (to determine current student use of, and satisfaction with, various aspects of the college). This data will be utilized for Institutional Effectiveness as well as for my dissertation.

We will survey all students who were first time NIACC attendees in the Fall of 1991. The plan is to reach as many students in class as possible before resorting to the mails. Consequently, beginning the week of April 6, 1992 we will distribute surveys, written instructions, and pencils to classroom instructors.

I did a pilot run on my Psychology class to test the face validity of additional questions that will be included with the survey. I found it worked smoothly to ask which students had first attended NIACC last fall and then to dismiss the other students 15 minutes early and have the remaining students fill out the survey. An additional question asking which students had filled out a survey in another class may also be in order for Arts and Science students. For instructors who do not wish to take up class time a similar technique could be used two or three minutes before the end of class, with instructions to return the survey the next class meeting.

I am enclosing a copy of the survey and the additional questions that will be asked, as well as a copy of the cover letter to students.

I appreciate your support in this endeavor. If you have questions or concerns please contact me (ext. 365). You will be kept informed concerning results. Thank you for your cooperation.
Dear Former NIACC Student:

It's your turn to grade NIACC! NIACC is in the process of a self-study to determine how well it is meeting its mission and goals. A vital part of this study is to get information and feedback from students and former students. We are asking that you assist us in our project by filling out the enclosed survey.

The survey should take approximately 20 minutes to complete. Please use a #2 lead pencil. You are asked to fill in your Social Security number so that we can make sure that all students who enrolled at NIACC in the Fall of 1991 for the first time have an opportunity to provide us with feedback. Your Social Security number will be used for research purposes only, and will not be used or listed on any report. All data will remain confidential and results will be reported in group form only.

If there are any questions on the survey that you choose not to answer, you may omit them; however, the more complete the questionnaires are the more usable data we will have. If you choose not to answer any of the questions, please fill out at least your Social Security number so that we do not contact you again. Non-participants will not be penalized in any way.

Thank you for your assistance and cooperation in our attempt to make NIACC even better. We believe that the information you provide will give us valuable insight into what we can do to assist students in being successful here.

In addition to using results from this survey in our institutional effectiveness effort, the results will be used in a doctoral dissertation by Sue Norton, NIACC counselor. Survey answers will be correlated with information such as assessment scores, grade point average, hours attempted, hours completed, and major program of study. Again, all data will remain confidential and be reported in group form only.

If you have any questions or concerns about this survey or the self-study, please contact Sue Norton at the Counseling Center. She can be reached by phone at 421-4365 or 1-800-392-5685.

After completing the survey, enclose it in the self-addressed stamped envelope provided and mail it back to NIACC by May 1, 1992. Thank you for your cooperation.

PLEASE USE ONLY A NUMBER 2 LEAD PENCIL - ONE HAS BEEN PROVIDED FOR YOUR CONVENIENCE.
Dear Former NIACC Student:

Two weeks ago you should have received a survey from NIACC. We have not yet received your completed survey. If you have mailed the survey, disregard this letter. If you have not yet completed the survey, please do so now and return it as soon as possible. If you lost the survey or never received it, please call Sue Norton at 421-4365 or 1-800-392-5685 and she will send you another.

Your input is important and we would appreciate your cooperation in completing and returning the survey. Again, if you have questions, please call Sue Norton.

Thank you.
APPENDIX F

MISSION OF THE COLLEGE
Linking: Mission, Purposes, and Institutional Effectiveness Goals

<table>
<thead>
<tr>
<th>Mission</th>
<th>Institutional Purposes</th>
<th>Institutional Effectiveness: College Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mission</strong></td>
<td><strong>Institutional Purposes</strong></td>
<td><strong>Institutional Effectiveness: College Goals</strong></td>
</tr>
<tr>
<td>- Ensure that all citizens of the North Iowa region, regardless of their educational and socio-economic backgrounds, geographic placement, or needs for special assistance, have both the opportunity and the necessary support to take advantage of postsecondary educational programs and other services offered by the College.</td>
<td>- A. Access and Equity</td>
<td></td>
</tr>
<tr>
<td>- Ensure that individuals have opportunities to prepare themselves for employment in occupations in demand in a global society.</td>
<td>- B. Employment Preparation and Placement</td>
<td></td>
</tr>
<tr>
<td>- Empower individuals by stimulating:</td>
<td>- C. College/University Transfer</td>
<td></td>
</tr>
<tr>
<td>* Curiosity about the natural and social universe.</td>
<td>- D. Adult and Continuing Education</td>
<td></td>
</tr>
<tr>
<td>* Intellectual integrity, appreciation of diversity, informed ethical values, and the aspiration for the best for oneself, one's family, one's community, and the world.</td>
<td>- E. Economic Development</td>
<td></td>
</tr>
<tr>
<td>* Joy of learning and use of creative and critical thought, including skills of intellectual problem solving, effective reading, clear writing, and articulate speaking.</td>
<td>- F. College/Community Partnerships</td>
<td></td>
</tr>
<tr>
<td>* Willingness and ability to exercise personal leadership, creativity, and adaptability to change.</td>
<td>- G. Cultural and Cross-Cultural Development</td>
<td></td>
</tr>
<tr>
<td>- Enable individuals to complete the first two years of a baccalaureate program within the region, and upon successful completion, to achieve efficient and effective transfer to senior colleges.</td>
<td>- H. Quality Orientation and Trust in all College endeavors.</td>
<td></td>
</tr>
<tr>
<td>- Empower individuals by stimulating:</td>
<td>- I. Ethical Leadership, effective leading, dear writing, and articulate appealing.</td>
<td></td>
</tr>
<tr>
<td>* Curiosity about the natural and social universe.</td>
<td>- J. Community Development</td>
<td></td>
</tr>
<tr>
<td>* Intellectual integrity, appreciation of diversity, informed ethical values, and the aspiration for the best for oneself, one's family, one's community, and the world.</td>
<td>- K. Cultural and Cross-Cultural Development</td>
<td></td>
</tr>
<tr>
<td>* Joy of learning and use of creative and critical thought, including skills of intellectual problem solving, effective reading, clear writing, and articulate speaking.</td>
<td>- L. Quality Orientation and Trust in all College endeavors.</td>
<td></td>
</tr>
<tr>
<td>* Willingness and ability to exercise personal leadership, creativity, and adaptability to change.</td>
<td>- M. Ethical Leadership, effective leading, dear writing, and articulate appealing.</td>
<td></td>
</tr>
<tr>
<td>- Ensure that individuals have opportunities to continue learning throughout their lifetimes.</td>
<td>- N. Ethical Leadership, effective leading, dear writing, and articulate appealing.</td>
<td></td>
</tr>
<tr>
<td>- Empower individuals by stimulating:</td>
<td>- O. Ethical Leadership, effective leading, dear writing, and articulate appealing.</td>
<td></td>
</tr>
<tr>
<td>* Curiosity about the natural and social universe.</td>
<td>- P. Ethical Leadership, effective leading, dear writing, and articulate appealing.</td>
<td></td>
</tr>
<tr>
<td>* Intellectual integrity, appreciation of diversity, informed ethical values, and the aspiration for the best for oneself, one's family, one's community, and the world.</td>
<td>- Q. Ethical Leadership, effective leading, dear writing, and articulate appealing.</td>
<td></td>
</tr>
<tr>
<td>* Joy of learning and use of creative and critical thought, including skills of intellectual problem solving, effective reading, clear writing, and articulate speaking.</td>
<td>- R. Ethical Leadership, effective leading, dear writing, and articulate appealing.</td>
<td></td>
</tr>
<tr>
<td>* Willingness and ability to exercise personal leadership, creativity, and adaptability to change.</td>
<td>- S. Ethical Leadership, effective leading, dear writing, and articulate appealing.</td>
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<tr>
<td>* Constructive use of leisure time, participation in recreational activities, and development of physical and mental well-being.</td>
<td>- T. Ethical Leadership, effective leading, dear writing, and articulate appealing.</td>
<td></td>
</tr>
<tr>
<td>* Understanding, appreciation, and participation in the arts and humanities.</td>
<td>- U. Ethical Leadership, effective leading, dear writing, and articulate appealing.</td>
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</tbody>
</table>

"The mission of the North Iowa Area Community College is to enhance the quality of life for people of North Iowa through comprehensive educational opportunities, progressive partnerships, exemplary service, and responsive leadership."
APPENDIX G

INSTITUTIONAL EFFECTIVENESS INDICATORS
<table>
<thead>
<tr>
<th>College Goals</th>
<th>Indicators of Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Access and Equity</td>
<td>A-1 Entrance and use of support services offered by the College and their availability to recruitment and retention</td>
</tr>
<tr>
<td></td>
<td>A-2 Educational goal achievement by total student body population (Retention, equity)</td>
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<td></td>
<td>A-3 Student retention and fall business from higher of general education, general education, and availability of financial aid</td>
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<td>A-4 Acceptance of transfer credits into NIACC</td>
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<td>A-5 Educational goal program by student population that in students and goal at risk (including, AB/ED, etc)</td>
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<td>A-6 NIACC credit accepted for non-collaborative learning</td>
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<td>A-7 Access vs. serving (distance learning/programming)</td>
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<td></td>
<td>A-8 College is able to attract, support, and retain heterogeneous populations</td>
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<td></td>
<td>B. Employment Preparation and Placement</td>
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<tr>
<td></td>
<td>B-2 Program completers' satisfaction with technical skills acquisition, general education, and employment relationships related in their career program</td>
</tr>
<tr>
<td></td>
<td>B-3 Employers' satisfaction with program completers' technical skills acquisition and employment relationships related to their career program</td>
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<td>B-4 Completion of requirements by program completers</td>
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<td>B-5 Program completers' satisfaction</td>
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<tr>
<td></td>
<td>B-6 Effective utilization of advisory committees and program evaluation processes and recommendations</td>
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<td></td>
<td>B-7 Current student satisfaction with career placement</td>
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<tr>
<td>C. College/University Transfer</td>
<td>C-1 National Effective Transfer Correlation (NETC) transfer rate and effectiveness measures</td>
</tr>
<tr>
<td></td>
<td>C-2 Acceptance of associate degree/2-year college credits by selected number of institutions</td>
</tr>
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<td></td>
<td>C-3 NIACC transfer students' GPA vs. native students' GPA at five Regent Universities</td>
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<td>C-4 Encouragement of integration of Regent students at the Regent's Institutions</td>
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<tr>
<td>D. Adult Continuing Education</td>
<td>D-1 Adult client satisfaction and goal attainment</td>
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<td></td>
<td>D-2 Employment satisfaction with selected academic programs</td>
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<td></td>
<td>D-3 Adult/Continuing education market penetration (contact hours per population analysis)</td>
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<td>D-4 Participation in and GED degree earned in the service area</td>
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<td></td>
<td>D-5 Noncredit student enrollment assessment</td>
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<tr>
<td>E. Economic Development</td>
<td>E-1 Use of College services by business through start, improve, or expand their business</td>
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<tr>
<td></td>
<td>E-2 Economic development organization satisfaction with College services</td>
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<tr>
<td>F. College/Community Partnerships</td>
<td>F-1 Quality and extent of partnerships and services provided through relationships between College and communities</td>
</tr>
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<td></td>
<td>F-2 Community use of College resources</td>
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<td></td>
<td>F-3 Participation by faculty, staff, students, and clients in the community services</td>
</tr>
<tr>
<td>G. Cultural and Cross-Cultural Development</td>
<td>G-1 Participation of credit students in cultural and inter-cultural activities of the College</td>
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<td></td>
<td>G-2 Participation of faculty and staff in cultural and inter-cultural activities of the College</td>
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<td>G-3 Participation of adult population of the service in cultural and inter-cultural activities of the College</td>
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<td>G-4 Relations and extent of opportunities to produce enhanced inter-cultural understanding</td>
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<td>G-5 Belief in quality of the cultural/cross-cultural experiences</td>
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<tr>
<td>H. Quality Orientation and Trust</td>
<td>H-1 College's ability to define and accomplish goals of college programs and services</td>
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<td></td>
<td>H-2 Public perception of the College</td>
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<td>H-3 Assessment of courses, faculty, and support for improvement quality improvement efforts</td>
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<td>H-4 Utilization of effectiveness data for improvement</td>
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<td>H-5 NCA review and findings</td>
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<td></td>
<td>H-6 Discipline-specific accreditation review and findings</td>
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<td>H-7 An organizational climate that encourages the active staff to contribute, develop policies, procedures, and operations, and make decisions important to the College</td>
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<td>H-8 Board effectiveness and findings</td>
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<td></td>
<td>H-9 Annual independent audit findings</td>
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</tbody>
</table>

National Alliance of Community and Technical Colleges, NIACC Revisions: 7/2/90, 7/15/90, 7/24/90, 8/1/90, 8/16/90, 9/10/90, 11/20/90, 12/27/90, 8/14/91, 7/12/91, 7/18/91, 7/24/91, 8/6/91, 8/15/91, 8/21/91, 10/14/91, 12/6/91, 11/7/92 and 4/24/92 by Instructional Council, Student Services Council, Economic Development, Continuing Education Council, Steering Committee, and Administrative Cabinet