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1995

The Telecourse Success Prediction Inventory

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Recommended Citation

LOYOLA UNIVERSITY CHICAGO

THE TELECOURSE SUCCESS PREDICTION INVENTORY

A DISSERTATION SUBMITTED TO

THE FACULTY OF THE GRADUATE SCHOOL

IN CANDIDACY FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

DEPARTMENT OF CURRICULUM, INSTRUCTION, AND
EDUCATIONAL PSYCHOLOGY

BY

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CHICAGO, ILLINOIS

MAY, 1995

ACKNOWLEDGMENTS

I would like to thank my dissertation committee members, Dr. Barney Berlin, Dr. Ron Morgan and Dr. Jack Kavanagh for their input and support of this project. I have also had the particular pleasure of completing classes with Dr. Berlin and Dr. Kavanagh and greatly appreciate the excellent educational opportunities they provided. Dr. Morgan's willingness to sit on my committee and share his expertise has certainly contributed to the success of my project.

Special thanks are extended to Dr. Berlin for serving as my committee chair. I greatly appreciate his help and guidance throughout this project. His responsiveness and genuine concern for students make life a little easier for me and my fellow doctoral candidates.

I would also like to thank Michael O'Donnell from the research department at Triton College. His expertise in data acquisition made what could have been a very difficult procedure much simpler. Additional thanks go to family and friends who have filled in the gaps created by this project.

Finally, my dissertation is dedicated to my husband, Bruce, for his tremendous support and encouragement throughout my entire educational endeavor. His faith in my ability has made it possible for me to reach my educational goal.

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CHAPTER I

INTRODUCTION

Background and Nature of the Study

Mastery of college coursework is imperative for success in today's reengineered, empowered, highly demanding workforce. Those who lack college training face limited employment prospects and are more likely to earn low wages. They constitute America's growing "forgotten majority." The US Bureau of the Census reports that the pay gap between college graduates and high school graduates widened during the 1980's. In the early eighties, high school graduates earned 26% less than their classmates who had gone on to college. By 1989 the gap had more than doubled to a 55% difference.

It is both economically and socially imperative that this large group receive the education they need to become an integral part of the new American workplace. Education must be readily accessible to our older, more diverse population. Students today are more likely than ever before to be employed and have family responsibilities. They find it difficult to adapt to the more rigid scheduling of traditional college courses. The advent of distance education has made it possible for this growing body of non-traditional students to gain a quality education while maintaining employment and fulfilling personal responsibilities. Educational technology in the form of telecourses, interactive video, computer assisted instruction and other advances have greatly enhanced the effectiveness of distance education. A working definition of distance education follows:

> Distance education consists of all arrangements for providing instruction or electronic communications media to persons engaged in planned learning in a place or time different from that of the instructor or instructors. (Moore 1990, p. XV.)

The key ingredient of distance education is that the instructor and learner are not in the same location during the bulk of the program. Alternate delivery systems allow students to take classes in a variety of locations. Men or women with small children can complete their education in their homes, employees can complete college degrees at work, and businessman who travel can continue their education no matter where their job takes them. It is an ideal delivery system for today's fast-paced, complex society. It has the added benefit of reducing transportation and limiting pollution from automobile emissions.

Historically, the community college has had the task of removing elitism from higher education and reaching students who would otherwise not pursue a college education. This community college philosophy is closely aligned with the increased accessibility of distance education.

A widely used form of distance education at the college level is the telecourse. Community colleges have been quick to adopt this form of media education. A nationwide survey conducted by the Corporation for Public Broadcasting found that 32 percent of responding colleges offered telecourses via videocassette (Brey, 1988). It is the most commonly used nonprint instructional technology (Lewis, 1985). Telecourses are successfully reaching students who would otherwise not attend college. A telecourse student survey found that 20% of the students were enrolled for the first time in college when they took a telecourse and about the same proportion were taking only a telecourse. More than half of the respondents chose the telecourse because on-campus sections did not fit their schedules (Parnell, 1984, p. 3). Through telecourse study, education is

available to students who are unable to attend traditional college courses. The primary advantages of telecourse education is that it closely approximates face-to-face instruction and it is readily available.

Since the television set and videocassette player have become readily accessible, a new dimension has been added to the development, distribution, and use of educational television programming. Telecourses on videocassette can be provided to adult learners who may view them on campus, in their homes, at work, or at their local library. Videotape consortia, such as the Northern Illinois Learning Resources Cooperative, offer courses on videocassette through learning centers and public libraries (Zigerell, 1986).

On the whole, research has shown that distance education is at least as effective as traditional methods, and at times it can be more effective. Whittington (1987) reviewed over 100 studies of telecourse versus conventional delivery and found that almost all telecourse students demonstrated equal or superior cognitive outcomes.

Distance education is not without drawbacks. Perhaps one of the most critical problems is retention. Students tend to drop out at higher rates than in conventional programs. Telecourses used by Triton Community College have experienced high attrition rates. Prendergast (1981, p.3) reported Triton's telecourse attrition rate at approximately double that of traditional courses. During 1993, 60% of the students registered for telecourses at Triton College withdrew or failed. Attrition is damaging to both the individual and the college. It can effect the college's long-term planning, academic programming, and funding (Gresty, 1981, p. 18). The student experiences personal disappointment, wasted time, money and effort (Peng, 1978, p. 10). Students who are unsuccessful in a telecourse, particularly if it is early in their education, may lose

confidence and fail to return and try again. The telecourse may have been their only attempt at higher education. The individuals may incorrectly assume that they could not successfully complete college coursework when in fact, they had chosen the wrong delivery mode at that time. With remediation, or after success in traditional coursework, the student may have been more successful in the telecourse.

There is a need for a reliable inventory to identify potentially at-risk students prior to their registration for telecourses. They could then be directed to a traditional course, a college skills development course, or receive additional institutional support during telecourse study. These potentially unsuccessful students could be salvaged to reach their educational goals.

The Present Investigation

Acknowledging that attrition in distance education is of critical concern, the prediction of telecourse completion is warranted. Experts in the field of distance education agree that there is a definite need to assess incoming students and evaluate their potential for success in non-traditional courses. In their instructional model for the effective delivery of distance education, Verduin and Clark (1991, p. 156) emphasize the importance of assessing the motivation, goals, competence, and self-directedness of incoming students. This is supported by Bajtelsmit (1990, p.189) who suggests the need to identify groups of students for whom distance education may be less effective. He recommends compensatory interventions for these students. In their model of distance education, Garrison and Baynton (1987) note that the degree to which individuals assume

control of their studies and their access to resources or support contribute to distance education success.

This study addresses the need to assess distance education students. An attempt was made to develop a valid, reliable inventory to accurately predict the potential for successful completion of telecourses. Persistence in distance education appears to be the result of complex interrelationships between students and their environment. Since the causes of attrition are multi-faceted (Woodly and Parlett, 1983), the instrument used to predict its occurrence must reflect this diversity. The instrument under study, the Telecourse Success Prediction Inventory (TSPI), is based on three factors that are believed to contribute to successful completion or failure in distanced education courses. It was designed to measure the internal factors of goal setting and attribution and the external factor of student support to predict the likelihood of students' successful completion of telecourses.

The first factor assessed by the inventory is institutional support. Academic support such as face-to-face, telephone, or written communication with the instructor or tutors has been reported to have a positive effect on the completion and success of distance education students (Ahlm, 1972; Millard, 1985; and Hoyle, 1988).

The second factor assessed was based on attribution theory. According to Weiner (1974), there are four causal attributions for performance: ability; effort; task difficulty; and luck. Attributions regarding past academic performance have been found to affect future performance of students in an academic setting (Weiner, 1986). This variable is expected to add to the predictability of the instrument under study.

The third variable under study is an estimate of achievement motivation. Altman (1990, p.141) states that the success of a distance education program lies in the striving character of its students. Those who are more determined to reach their educational goals are more likely to persist and complete courses. Achievement motivation is an important dimension in predicting telecourse success.

The overall purpose of this study was to develop a survey instrument based on the underlying relationship of these factors to predict telecourse completion. This instrument could be administered prior to registration and could serve as an aid in student placement. A student whose inventory score indicates that he or she is unlikely to complete a telecourse could be guided toward a traditional classroom or receive intervention in the form of a college preparation course, or additional institutional support during telecourse study. Students who score highly on the inventory might be encouraged to consider a telecourse when they otherwise might not have.

Research Questions

The major research question to be addressed by this study is:

Based on the interrelationship of factors that affect student telecourse attrition identified as attribution, achievement motivation, and institutional support, is it possible to develop an inventory that predicts student completion of telecourse study?

Several secondary questions are also addressed:

1. Do attribution style and/or motivation significantly effect telecourse success?

2. Do demographic factors significantly effect telecourse completion?

3. Do study habits significantly effect telecourse success?

Setting

Triton Community College is a public, two-year institution that was founded in 1964. Triton College offers a comprehensive array of university transfer, career education, and continuing education programs. Enrollment in 1994 was 17,554 students. Full-time students constitute 22% of this number with 78% part-time students. The student body is 43% male and 57% female.

Triton College is governed by an eight member board of trustees. The district includes 26 communities in the Western and near Northwestern suburbs of Chicago. The district covers a total of 65 square miles and has a population of 319,655.

Student Demographics

The student population at Triton College is both culturally diverse and aging. The majority of the students are older with 3.8% 18-20 years old, 5.7% 21-24 years old, 32.9% 25-44 years old, 10.2% 45-54 years old, 4.6% 55-59 years old, 4.9% 60-64 years old, and 15.8% over 65 years of age. The population is also racially diverse with 73.3% white, 16.1% African American, 8.0% Hispanic, 2.4% Asian, and .2% Other.

Although the number of Triton students who are recent high school graduates has declined to a meager 3.8%, 40.8% of the current student population has achieved a high school degree or less. This indicates that the majority of this group did not seek higher education upon graduating from high school and are returning adult students. These individuals are more likely to have family and job responsibilities and require the flexibility of telecourse study. More than 800 students enroll in telecourses at Triton College each semester.

Organization of the Dissertation

Chapter I outlines the theoretical background of this study. In Chapter II, I detail support for the study of telecourse attrition from relative literature. In addition, I elaborate on the three underlying constructs forming the basis of the predictive instrument: institutional support, attribution, and achievement motivation. Also included in this chapter is a description of the pilot study that will result in the inventory development. Chapter III contains the procedures and methods involved in establishing the reliability and validity of the instrument. Chapter IV describes the data analysis and discusses the results of the study. The study is summarized in Chapter V and the implications of the results discussed. Recommendations for further research are included in this chapter.

CHAPTER II

REVIEW OF THE LITERATURE

An Overview

As noted in Chapter I, the overall purpose of this study is to examine The Telecourse Success Prediction Inventory's ability to discriminate between telecourse completers and non-completers. The inventory was developed in a pilot study conducted in September and October, 1994. It was designed to assess three factors: attribution theory; achievement motivation; and institutional support.

This Chapter consists of a review of literature pertinent to the following areas: (1) Telecourse Study in Higher Education; (2) Persistence in Higher Education;(3) Institutional Support; (4) Attribution Theory; 5) Achievement Motivation; and (6) Measurement and Prediction.

Telecourse Study in Higher Education

The American Education system has moved from an elite to a more universal form. A landmark event in this evolution was the passing of the 1944 G.I. Bill of Rights. This act allowed all classes of people the economic ability to obtain higher education. The next major phenomenon that increased the accessibility of higher education was the rise of the community college in the 1960's and 1970's. Higher education became accessible to more people than ever before.

The latest catalyst of change in teaching and learning is distance education. In the year 2,000 and beyond, institutions will become increasingly interconnected and decentralized. Learners will be more likely to participate in higher education as our rapidly changing society places greater value on it.

The characteristics of students in higher education are changing and so are their needs. Part-time learners are the fastest growing population. Nationally, almost 40% of pre-baccalaureate students attend college part-time and more than 65% of master's degree candidates are part-time learners (Duning, Kelerix, and Zaborowski, 1993, p. 267). Educational institutions must embrace and adapt to the needs of this burgeoning group. The new educational majority are part-time students, diverse in age and race. They prefer educational programs that are convenient, tailored, low cost, and of high-quality (Dunning, et al., 1993, p.267). According to Moore (1990, p. 398) there are four barriers that prevent Americans from achieving all they can from higher education. These are distance, time, access to resources and cost. Distance education attempts to remove theses barriers making higher education readily available to all.

The primary benefit of distance education is its accessibility. It is available where education may not have been before. Individuals in rural locations or those with families may have only a choice of no education or a telecommunication based program. Distance education is also much more convenient and saves commuting time. This may be enough to allow the non-traditional student to pursue higher education that otherwise would not have been feasible.

The potential for education via television was recognized during the 1950's and 1960's with new programs such as Chicago TV College and Sunrise Semester on the air. Next, college professors began taping lectures for viewing in other locations or at other times. Science professors used television to magnify demonstrations for students in large lecture halls. After this, television was used to send and receive educational information to and from remote locations via microwave transmission (Tate and Kressell, 1983, p. 57).

At the same time, community college enrollment was rising quickly. In response, community colleges quickly adopted the use of telecourse study during the 1970's. The availability of telecourse materials increased in 1981 with the Annenberg endowment of $150 million to the Corporation for Public Broadcasting for the creation of new telecourses (Corporation for Public Broadcasting, 1981, p.7).

Although the telecourse has been a valuable resource in higher education, it is not without drawbacks. Perhaps the most serious, unresolved problem in distance education and telecourse study is the rate of student attrition that can be as high as twice that of traditional courses. The attempt to resolve this limitation gives rise to several important questions. Is it possible to predict in a valid and reliable manner students who are more likely to drop out of telecourses? What factors whether they be student-based or institutional are underlying causes of persistence? The next section of this literature review provides the framework for studying these questions.

Persistence in Distance Education

Persistence in distance education is defined by Cookson (1990, p. 192) as provisional registration followed by final registration, completion of all course assignments prior to final examination, and earning of college credit following the passing of the final examination. Failure in one or more component leads to non-completion. Several studies have been conducted to identify the cause of completion or non-completion in distance education. Woodley and Parlett (1983) identify multiple causal factors responsible for attrition in distance education. They view student dropout as:

> a systematic problem, relating to the. . . (institution's) working as a whole. It is not due to a neatly encapsulated and isolated malfunction . . . (institution's) operation which can be put right by replacing a single component. Rather, imaginative and carefully selected interventions are needed at various points throughout the system. Multi-causal problems require multiple part solutions which operate progressively and cumulatively to produce long-term changes in trends (p. 23).

The majority of research in the area of attrition in distance education has focused on three areas: institutional support, student reasons for dropout, and student characteristics.

Institutional Support

Several variables relating to the distance education student's environment have been identified as factors effecting completion. Telephone contact between students and tutors has been found to be a positive experience for students and improve grades (Ahlm, 1972). Another factor, face to face tutorial contact, was found to increase success in less qualified distance education students (Millard, 1985). Stone (1991) found that students with an external locus of control were more likely to complete distance education courses if they received regular telephone contact with a tutor. Other forms of tutor and faculty contact

were found to have a positive effect on performance. Rekkedal (1983a) corresponded by mail with inactive distance education students and found that assignment submission increased significantly as a result. In addition, the speed of instructor response also improved persistence. Reducing the turnaround time for instructor feedback from 8.3 days to 5.6 days significantly increased course completion rates (Rekkedal, 1983). Hoyle (1988) found that external assessment feedback regarding quiz scores significantly increased test scores. Students' self-assessment of subject knowledge had no effect on scores. Students' use of instructional materials also improves persistence. Woodley and Parlett (1983) found that the more time students spent viewing television resources associated with the course and the more books used (except in math) the less likely they were to dropout or fail. In a study of the characteristics of successful telecourse students at Dallas County Community college, the only significant determinant of success identified was attendance at an on-campus orientation session (Topper, 1975).

It is obvious that distance education students are more likely to succeed and persist in a richly supportive environment. Factors such as instructor feedback, face-to-face, telephone, and mail contact with instructors and tutors, orientation, and the use of video and written study materials all increase student retention and success. Several studies have also indicated that these resources are particularly effective in reducing attrition in less qualified students. This effect highlights the need for a reliable inventory that could identify potentially at-risk students requiring guidance and intervention.

Student Reasons for Dropout

The most superficial investigations of attrition in distance education involve student self-report of reasons for success or failure. A number of studies have been conducted that identify a common set of reasons for student withdrawal from distance education courses. Woodly and McIntosh (1977) surveyed 6,439 students in the British Open University regarding reasons for dropout. Almost two-thirds cited personal or domestic reasons, 29% stated insufficient time for study, 25% cited financial constraints, 25% cited child care or other domestic demands, 60% had other plans for study, and 40% reported were dissatisfied with the courses or teaching methods.

In other research, students major areas of study effected persistence. In their survey of disadvantaged adult students, Carr and Ledwith (1980) found that arts and social science students were more likely to cite personal or domestic problems as the reason for dropout while those in math, science, and technology courses cited job-oriented reasons.

In a ten-year study of students in the NKI School in Norway, Rekkedal (1983) reports that students emphasized lack of time, job requirements, change in career plans, illness, and unsatisfactory personal conditions as reasons for course withdrawal. According to Kennedy and Powell (1976) the majority of students cite external reasons for their withdrawal from distance education courses.

Student Characteristics

Students enrolled in telecourses today are more likely to be employed with more than half having full-time jobs outside the home. More than half are women, and more

than half have family responsibilities. Almost all are part-time and over the age of twenty-five. The majority are Caucasian and come from a low to middle income economic group or above (Moore, 1990, pp. 174-175).

Several attempts have been made to develop a profile of persistent and non-persistent distance education students based on their characteristics. Studies relating to demographic characteristics have been inconclusive. Carr and Ledwith (1980), Coggins (1988), and Dille and Mezack (1991) found age, gender, and other demographic factors to have a significant effect on completion. Other studies by Foley (1993), and Coldeway and Spencer (1980) did not find demographic and background factors to have a significant effect on completion. Boshier (1988) suggests that less than 10 percent of the total variability in student completion can be attributed to demographic factors. Another predictor examined is prior academic success. Greenberg (1981) found that the most significant predictor of course achievement was high school grade point average and the most significant predictor of completion was course performance. Coggins (1988) has also determined that past experience in college and grade point average significantly discriminate completers from non-completers of distance education courses. Students are also effective predictors of their own success. Sweet (1986) and Coggins (1988) found that students' perceptions of their academic ability are highly predictive of their success. This also supports the premise that attribution is an underlying factor in attrition. Students who are more optimistic about their potential for success are more likely to attribute this success to their own ability or effort rather than to luck or chance.

Additional student characteristics such as learning style, cognitive style, and motivation have been examined as potential predictors of completion in distance education. Coldeway (1986) concludes that motivation-related variables do effect success in distance education. This supports achievement motivation as a predictor variable of distance education success.

Attribution Theory

A causal attribution is an inference about why an event happened to oneself or to another person. In achievement attribution, which is the primary concern of this investigation, individuals may infer causality about academic success or failure on the basis of perceptions about their (or another student's) ability to complete the task in question, the degree of effort expended, the difficulty of the task, and the degree to which luck influenced the outcome (Weiner, Frieze, Kukla, Reed, Rest & Rosenbaum, 1971). These causes or attributions have been found to vary along two primary dimensions: locus of control and stability (Weiner, et al., 1971). The locus of control dimension refers to the degree to which a cause is related to factors within the person or to external factors in the environment. Internal causes are ability and effort, while external causes relate to task difficulty and luck. According to Weiner and his colleagues (Weiner, et al., 1971), these internal and external causes can fluctuate in stability across time and situations. Ability is an internal cause that is relatively stable. Effort is also an internal cause, but is unstable because it tends to fluctuate across situations and time. Luck is an external, unstable cause. Task difficulty, a less variable environmental factor, is an external, stable cause. Figure 1 is a categorization schema of the four variables.

Figure 1.--Attribution Schema

Locus of Control	Stability Stable	Unstable
Internal	Ability	Effort
External	Task Difficulty	Luck

Weiner has conducted several investigations of the relationship between attribution and academic performance. When investigating college students, Weiner (1971), found the attribution of failure to ability or task difficulty led to poor future performance. In a subsequent study, Weiner (1986) found that students high in the need for achievement were more likely to attribute failure to lack of effort (internal, unstable). Those with a low achievement need were more likely to attribute failure to lack of ability (internal, stable). Weiner concluded that attributions about past performance can affect future problem solving strategies, persistence, and accuracy of problem solving. Although there is no indication of research dealing with attribution theory and telecourse or distance education students at this time, previous studies have consistently found that attribution affects the future performance of students in a general, academic setting. This variable is expected to contribute to the predictability of the instrument under study.

Achievement Motivation

The third predictive factor in this investigation is achievement motivation. Morris (1990, p. 408) defines motivation as the response to an inner directing force that arouses the organism and directs its behavior toward a goal. Murray (1938, pp. 80-81) defines achievement motivation as a desire to excel and "to overcome obstacles, to exercise power, and to strive to do something difficult as well and as quickly as possible."

Achievement motivation is an important variable in this study because of its link to persistence in academic performance. French and Thomas (1958) found that 47% of the subjects high in the need for achievement (*n* achievement) persisted up to the time limit in working on an insoluble task as compared with only 2% of those low in *n* achievement. Altman (1990, p. 141) states that the success of a distance education program lies in the striving character of the students. Individuals who are more determined to reach their educational goals are more likely to persist and complete courses.

David McClelland has extensively investigated achievement motivation. In reviewing his findings as they relate to academic performance, it is important to note that he found internal drive, as opposed to external supervision, to be a critical factor in the performance of those high in *n* achievement (1982, p.231). In an earlier study, Wendt (1955) found that subjects high in *n* achievement performed significantly better in mental arithmetic tasks when they did not receive outside supervision in the form of scheduling and constant reminders. Students in distance education courses receive little external control, and in light of Wendt's results, it is expected that students high in n achievement are more likely to perform well in a self-study environment.

Mcclelland (1976) has identified personal characteristics likely to be possessed by those high in achievement motivation. He suggests that productive individuals high in n achievement can set goals, determine how to reach them, use data for decision making, delay rewards, take risks, and assume personal responsibility for their own behavior. They are also innovative, and seek out easier, better ways to accomplish their goals. The questions relating to achievement motivation in the TSPI are based on these characteristics.

1994 Pilot Study Findings

A pilot study was undertaken in September and October, 1994 to identify factors to be included in an instrument that would predict telecourse success. Subjects were 30 students at Triton College, a community college located in River Grove, Illinois, who had registered for a telecourse.

The pilot instrument consisted of a cover page on which students were asked to indicate demographic data, information regarding their telecourse history, and their use of institutional support services. The next section consisted of a brief description of twelve academic situations requiring forty-eight causal attributions. Subjects were asked to make causal attributions for each situation to ability, effort, task difficulty and luck. In the third section, subjects rated the degree to which thirty-five statements based on McClelland's (1976) personal characteristics of productive individuals were true or false for them.

Subjects were placed into two groups, completers (final grade of A, B, or C) or non-completers, (final grade of D, F, or W). An item analysis was conducted to eliminate

components that were ineffective discriminators of completion or non-completion. Questionable items with less than 95 percent accuracy in discriminating between successful and unsuccessful completers were eliminated. The TSPI was reduced to a total of 8 statements requiring four causal attributions each and 20 achievement motivation statements that students rated.

Summary

One of the most challenging problems facing distance education and telecourse study today is the issue of retention. Students are less likely to successfully complete distance education courses than traditional courses. Lack of retention has a negative effect on both the student and the institution. Of particular interest is persistence in telecourses study. Telecourse study is a widely used, readily available form of distance education that has great potential for offering educational opportunities to those whose schedules do not allow for tradition on-campus coursework.

Persistence in distance education is a result of a complex interrelationship between the student and the educational environment. The students' belief in themselves, their perceived level of control over their environment, their ability to persist at a difficult task, and the support provided by the institution may combine to effectively predict completion of telecourses. Attribution of causal events to one of four variables (ability, effort, task difficulty, or luck) is possibly an underlying construct that predicts successful completion of telecourses. Another important variable to be examined, achievement motivation, is also expected to add to the predictability of the instrument under study.

The third variable (institutional support) is also believed to play an important role in the success of distance education students. Instructor contact, feedback, tutor availability, the use of media and instructional aids, and orientation programs are all believed to have a significant effect on student success and retention.

It is important to examine the effect of both student traits and institutional support in predicting the success and retention of telecourse students. Students who attribute academic failure to a lack of ability, especially in conjunction with a low need for achievement, may have more difficulty with telecourses when there is little institutional support.

Currently there is no scale available which predicts telecourse completion based on attribution, achievement motivation, and institutional support. It would be a valuable tool for college educators, administrators, and counselors to use to identify students who might have difficulty completing telecourse programs. When identified, at-risk students could be guided toward more traditional studies, telecourse preparatory coursework, or receive greater institutional support. It could reduce student failure and decrease attrition benefiting both the individual and the institution.

CHAPTER III

METHOD

The purpose of this study is to develop a reliable, valid inventory to predict the potential for telecourse completion. The Telecourse Success Prediction Inventory (TSPI) was developed to achieve this purpose. A description of the methodology used to create and test the TSPI follows.

Inventory Construction

The TSPI is designed to accurately predict students' potential for successfully completing telecourses. It consists of three scales: an academic support scale; an attribution scale; and an achievement motivation scale. These three scales correspond to the three underlying factors serving as the theoretical basis for the study. An noted in Chapter II, a three-part inventory was based on the findings of a pilot study conducted in September and October of 1994.

Section I of the TSPI begins by asking students to supply demographic information (age, sex, employment status, race, and education level). Next they are asked to supply historical information about their telecourse experience and study habits. Finally, the subjects are asked to complete the academic support section (orientation, detailed syllabus, telephone contact with instructor, written contact with instructor, use of tutoring

services, and timely return of assignments by instructor) where they indicate their experience with various forms of support and evaluate their satisfaction with each experience. Section II of the TSPI is an attribution scale based on Wiener's theory of causal attribution (1974). When completing the scale, subjects are instructed to imagine themselves as having experienced four positive and four negative academic situations. Next, they rate the degree to which they would attribute each experience to four causes identified by Weiner (ability, effort, task difficulty, and luck). Subjects make four attributions for each of the eight situations for a total of thirty-two causal attributions in completing Section II of the TSPI.

Section III was designed to assess the achievement motivation of the subjects. In the TSPI, subjects read twenty statements relating to McClelland's (1976) personal characteristics of productive individuals and rate the degree to which each statement is true for them. McClelland (1985) recognized that the direct method of measuring achievement orientation, as used in the TSPI, is an effective procedure for assessing this variable. He stated that the summary score of attitude surveys directly measures the achievement variable as it relates to incentive for success.

Throughout the TSPI, an independent, Likert-type rating scale is used. In their comparison of three methods of measuring attribution, Elig and Frieze (1979) found that an independent, Likert-type scale provided the most valid and reliable method of assessing this variable. To enhance consistency, this method was used throughout the inventory.

The TSPI was standardized by collecting 231 valid surveys administered to individuals who had registered for telecourses at Triton College. A discriminant analysis procedure was used to place students into completers and non-completers groups. The level of significance was set at alpha = .05.

Instrument Scoring and Standardization

A five-point, Likert-type scale was used throughout the inventory. In Section I, subjects indicated which examples of telecourse support they have experienced and how positive or negative each was for them. In Section II and III subjects indicated to what degree each statement is true or false for them. Items were scored by assigning numerical values to correspond to the subjects' responses. In scoring, the responses are credited 5, 4, 3, 2, or 1 with a score of "5" at the true end and "1" at the false end. In Section III (the achievement motivation scale) subjects who responded with true to a favorable statement received a score of "5" as did those who respond with false to an unfavorable statement. In computing the total score of a subject, responses to the items will be totaled and then multiplied by the unstandardized discriminant scores.

Classification of Subjects into Groups

As noted above, subjects were placed into two groups, successful completers (final grade of "A", "B", or "C") or unsuccessful completers, (final grade of "D", "F", or "W"). Using unstandardized discriminant scores, group means and standard deviations were calculated. A cut-off score that differentiates completers from non-completers was

identified using unstandardized discriminant means and standard deviations. Subjects were placed in a group based on this cut-off score. To enhance clarity, this procedure is depicted in Table 1.

Table 1.--Cutoff Score Determination: Telecourse Completer and Non-completer Groups

Telecourse Non-completers | Telecourse Completers

Midpoint
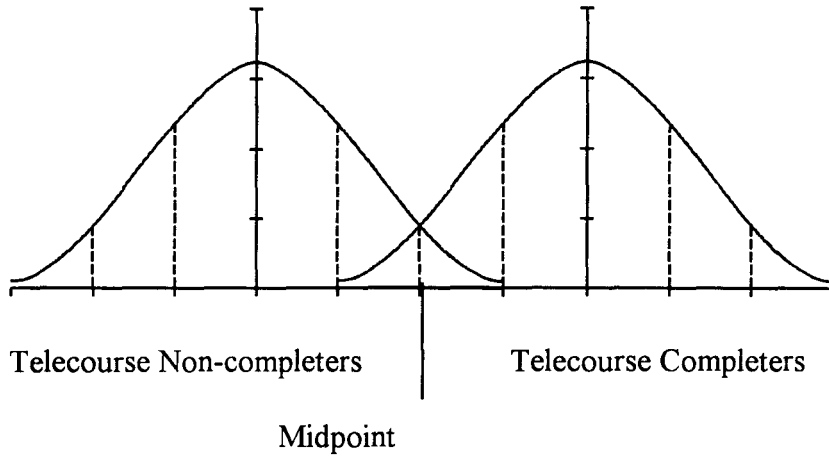
The probability of correctly classifying subjects into groups was determined by identifying the probability of being incorrectly classified. Classification tables were constructed. Table 2 presents the technique used to accomplish this.

Table 2.--Determining Classification Probabilities: Telecourse Completer and Non-completer Groups

Telecourse Non-completers | Telecourse Completers incorrectly classified as completers

Midpoint
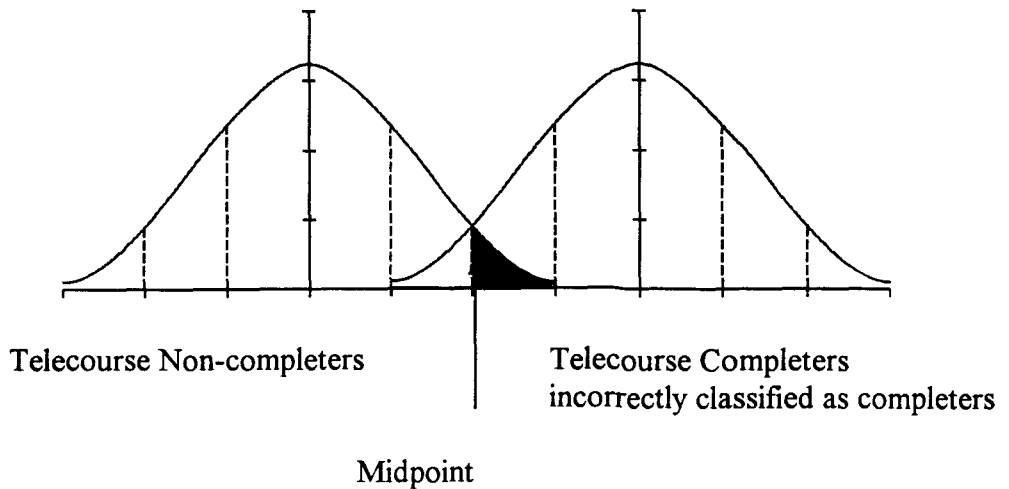
Sources of Data

Subject Selection

Subjects were chosen from a pool of 1,605 students who had registered for telecourses during August, 1993 to June, 1994 at Triton College. The telecourses included were: Accounting 101; Art 112; Business 141; Business 150; Economics 102; Economics 103; English 103; History 151; Health 104; Humanities 101; Marketing 125; Music 110; Psychology 100; Physical Science 150; Psychology 216; Psychology 222; Psychology 228; Psychology 238; Rhetoric 101; Rhetoric 102; and Sociology 100.

The subjects were obtained from telecourse enrollment lists provided by the research department at Triton College.

Inventory Administration

The inventory was administered in December of 1994 and January and early February, 1995. The TSPI was distributed to two groups, successful completers (final grade of A, B, or C) or unsuccessful completers, (final grade of D, F, or W) and to current telecourse students through Triton's Media center. A random selection was performed to identify the 800 students who would receive the Telecourse Success Prediction Inventory. The survey was mailed to the identified students with instructions for completion and a postage paid return envelope. An additional 200 surveys were distributed to telecourse students by Triton's Media Center. A total of 1,000 surveys were mailed or distributed to telecourse students at Triton College. An overall response rate of 28.4% was attained. Participation in the study was voluntary.

Statistical Procedures

First of all, a descriptive analysis was performed on the data set using SPSSX, the Statistical Package for Social Studies. The results include mean scores for groups, numbers of cases, and group standard deviations.

Power

The power of a test is the probability of rejecting the null hypothesis when it is false. The Alpha level for this study was set at .05. With a population of 600 subjects, power is expected to be at .80 or higher. According to Stevens (1992, p. 174), when sample size is large (100 subjects or more per group), power is not an issue.

Inventory Validity

Content validity was systematically built into the inventory during its development. Telecourse syllabi were examined and course objectives discussed with subject-matter experts. Specifications were developed that appeared to identify critical behaviors for success in telecourses.

The Criterion related validity of the instrument was examined to determine whether The Telecourse Success Prediction Inventory is capable of distinguishing completers from non-completers at a significant level. The subjects' group status of completer or non-completer was correlated with their unstandardized discrminant scores from the inventory. Subjects were assigned to groups based on their final grades. The method of determining group membership is described in the section titled "Inventory Scoring". Correlations between group membership and the subjects' unstandardized discriminant scores were derived. Significant correlations were used to validate the inventory's ability to predict completion of telecourse studies.

Inventory Reliability

An objective scoring method was developed for the inventory to assure its reliability. The internal consistency of content sampling was evaluated using the Spearman-Brown Split-half Reliability procedures. This determined the reliability of the population.

<u>Discriminant Analysis</u>

A discrminant analysis procedure was performed to derive scores, classification tables, and examine the validity of The Telecourse Success Prediction Inventory. It was also used to classify students into groups.

A linear discriminant analysis was used to determine the accuracy of the classification of students into completer and non-completer groups. The required assumption of normality was tested using the Box's M test for normality. Hit rates were obtained and tables developed.

CHAPTER IV

RESULTS

The major research question addressed by this study concerns the need to develop an inventory that predicts student completion of telecourse study. To accomplish this, the Telecourse Success Prediction Inventory was developed and administered to individuals who had registered for a telecourse at Triton College.

This study also addressed several secondary questions. The first of these asks if there is a significant relationship between student achievement or motivation and attribution style. The second research question refers to the differences between student telecourse completers and non-completers with regard to demographic factors. Finally, the third secondary question examines the difference in study habits between telecourse completers and non-completers.

This Chapter begins by presenting the analysis of data related to evaluating the reliability, validity, and effectiveness of the Telecourse Success Prediction Inventory. Following this, data related to the three secondary research questions is summarized. A thorough discussion of the conclusions, limitations, and recommendations for further research will follow in Chapter V.

Subject Selection

Subjects were chosen from a pool of 1,605 students who had registered for telecourses during August, 1993 to June, 1994 at Triton College. The subjects were obtained from telecourse enrollment lists provided by the research department at Triton College. A random selection was performed to identify the 800 students who would receive the Telecourse Success Prediction Inventory. The survey was mailed to this selection with instructions for completion and a postage paid return envelope.

Response Rates and Sample Summary

The Inventory was distributed to 800 students who had registered for a telecourse during August, 1993 to June, 1994 at Triton College. A total of 400 surveys were mailed to successful students who had attained a grade of "A", "B", or "C' in a telecourse. Another 400 surveys were mailed to unsuccessful students attaining a "D", "F", or Withdrawal in a telecourse during the identified period of time.

An additional 200 surveys were distributed to successful students through Triton's Media Center. Cover letters and instructions were also included with these surveys.

Of the 400 surveys mailed to successful students, 164 were received for a response rate of 41 %. Of the 400 surveys sent to unsuccessful students, 87 were received for a response rate of 22%. Of the 200 surveys distributed through the Media Center, 33 were received for a response rate of 17 %. The total number of surveys received was 284 with an overall response rate of 28%. Of the 284 cases received, there were 231 valid cases that were used in the analysis. Cases were considered to be invalid

if improperly completed. Subjects in this category failed to respond to all questions on the inventory or chose more than one answer to a questions. Table 3 contains a summary of sample size and telecourse completer and non-completer group membership.

Table 3.--Obtained Sample: Summary of Telecourse Completer and Non-completer Group Membership

Group Membership	N	Percent
Telecourse Non-completer	66	29%
Telecourse Completer	165	71%
Total	231	100%

Grade information was obtained from computer printouts provided by Triton's Research Department. Table 4 lists the grade summaries for students included in the study.

Table 4.--Grade Summaries for Students Included in the Study

Telecourse Grades Achieved	N	Percentage
A	41	17.7%
B	72	31.2%
C	52	22.5%
D	24	10.4%
F/Withdrawal	42	18.2%
Total	231	100.0%

Inventory Scoring

Inventory scores were calculated by summing the subjects' responses to the three parts of the inventory separately. In the first portion of the inventory that dealt with institutional support, each of the seven questions were scored independently of the others. In the second section exploring attribution, scores were calculated for each attribution variable: ability, effort, task difficulty, and luck. Separate summaries were made for attributions to successful and unsuccessful academic situations. The third section of the inventory evaluated motivation. A total motivation score was calculated for each subject.

Linear discriminant analysis was used to analyze the inventory results. The inventory scores were used as predictor variables or input data in the linear equation. The 7 support items, the 8 attribution scores, and the motivation score were all entered into the equation. Subjects were classified into groups, the criterion variable, based on their

previously earned telecourse grade. Item weightings were derived for each predictor variable. The subjects' responses were then multiplied by the weights, all items summed, and total unstandardized discriminant scores obtained. The discriminant scores were then used to classify subjects into completer or non-completer groups. Table 5 contains the unstandardized linear discriminant weights for each variable.

Table 5.--Unstandardized Linear Discriminant Weights: By Variable for Telecourse
Completers and Non-completers

Variable	Weight
Ability/Failure	-.082
Ability/Success	.014
Effort/Failure	.064
Effort/Success	.042
Luck/Failure	.044
Luck/Success	-.021
Task Difficulty/Failure	-1.051
Task Difficulty/Success	.042
Motivation	.074
Telecourse Support 1	.371
Telecourse Support 2	.154
Telecourse Support 3	.666
Telecourse Support 4	1.194
Telecourse Support 5	-1.740
Telecourse Support 6	.419
Telecourse Support 7	-.642
Constant	-7.684

<u>Inventory Score Descriptive Statistics</u>

A descriptive analysis of the successful and unsuccessful telecourse classification scores was performed. Table 6 contains the results of this analysis. The descriptive information is summarized according to group membership in the completer/non-completer telecourse groups.

Table 6.--Descriptive Summary of Inventory Scores: By Telecourse Completer and Non-completer Groups

Group Membership	N	%	Mean	SD	Minimum Score	Maximum Score
Telecourse Completer	165	71%	.34	.93	-2.82	2.97
Telecourse Non-Completer	66	29%	-.85	1.16	-3.47	1.37
Total	231	100%	.01	1.14	-.347	2.97

An Analysis of Variance procedure was performed to determine if significant differences exist between the mean scores for successful and unsuccessful cases (Table 7). As expected from the discriminant procedure used, a significant difference did exist between mean completer discrminant scores and non-completer discriminant scores ($F = 10.64$, $p < .001$).

Table 7.--Analysis of Variance Results: Obtained Mean Scores by Group Membership

N	DF	SS	MS	F	Sig.
231	5	8.95	1.79	10.64	.001

Inventory Validity

In the study, criterion related validity is defined as the inventory's ability to predict telecourse completion or non-completion based on the subjects' inventory scores. This was determined by performing ETA correlations using the classification groups of completers and non-completers and the derived discriminant scores for the TSPI. The results indicated a significant relationship between discriminant scores and telecourse completion with ETA = .482, Power > .99 as depicted in Table 8.

Table 8.--Inventory Criterion Related Validity: Inventory Obtained Scores Correlated with Group Membership

N	ETA	ETA^2	Power*
231	.482	.232	>.99

*Alpha=.05

Inventory Reliability

The Spearman-Brown Split-half reliability procedure was used to investigate the TSPI's reliability or consistency of measurement. A sample of 50 cases were randomly chosen from the 231 subjects included in the research. Twenty-five of the cases were from the completer group and 25 were from the non-completer group. Scores from each item on the inventory were included in the reliability test.

The TSPI is actually a battery of three tests measuring three different constructs. Due to this, the reliability of each section of the inventory was examined separately. The results of the reliability tests are listed in Tables 9, 10, and 11.

In Table 9, a reliability coefficient of .58 was obtained for the telecourse support inventory. Although this correlation is significant at $p < .05$, the obtained correlation of .588 is lower than the desirable reliability coefficient of .80. The same holds true for the attribution and motivation inventories with obtained correlation values of .534 and .667 respectively as displayed in Tables 10 and 11. Once again, both correlations display statistical significance, but have coefficients lower than desired.

Table 9.--Inventory Reliability: Spearman Brown Split-half Coefficient for Telecourse Support

N	r	r²	Sig.	SD	SEM
50	.588	.346	p < .05	.17	.04

Number of items = 59

Table 10.--Inventory Reliability: Spearman Brown Split-half Coefficient for Attribution

N	r	r²	Sig.	SD	SEM
50	.534	.285	p < .05	.802	.55

Number of items = 59

Table 11.--Inventory Reliability: Spearman Brown Split-half Coefficient for Motivation

N	r	r²	Sig.	SD	SEM
50	.667	.445	p < .05	4.24	2.44

Number of items = 59

Classification Table Development

Telecourse Completer/Non-completer Groups

A classification table for the population was developed by first calculating unstandardized discriminant scores for all cases. The population was separated into completer and non-completer groups. The unstandardized scores were then standardized for each subject in both groups.

Telecourse Completer Cut-off Scores

The distribution for each group was placed on a single distribution. The midpoint between the two group means was obtained. The midpoint is the cutoff score for classifying subjects as completers or non-completers. Table 12 graphically represents this procedure.

Table 12.--Determination of Cutoff Scores: Telecourse Completer and Non-completer Groups

X = -.86	X = .35
SD =1.14	SD =1.14
Telecourse Non-completers	Telecourse Completers

Midpoint = -.25
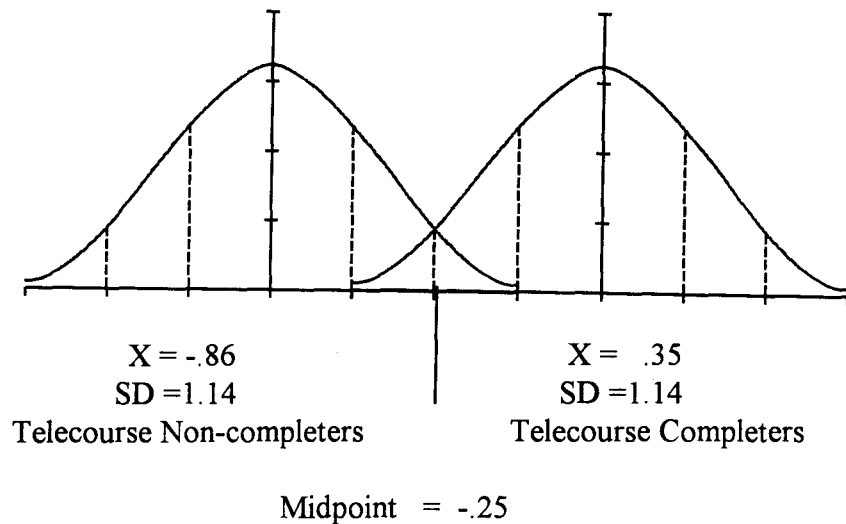
Completer Group Classification Probability

In calculating the cutoff scores used to assign cases to alternative criterion groups, the score likely to result in the fewest errors of classification was chosen. As depicted in Table 13, the distribution for each group was placed on a single distribution. The best cutoff score is located midway between the means of the two groups or at -.25.

Table 13.--Telecourse Completer and Non-Completer Group Classification Probability
Determination

X = -.86
SD =1.14
Telecourse Non-completers

X = .35
SD =1.14
Telecourse Completers

Midpoint = -.25
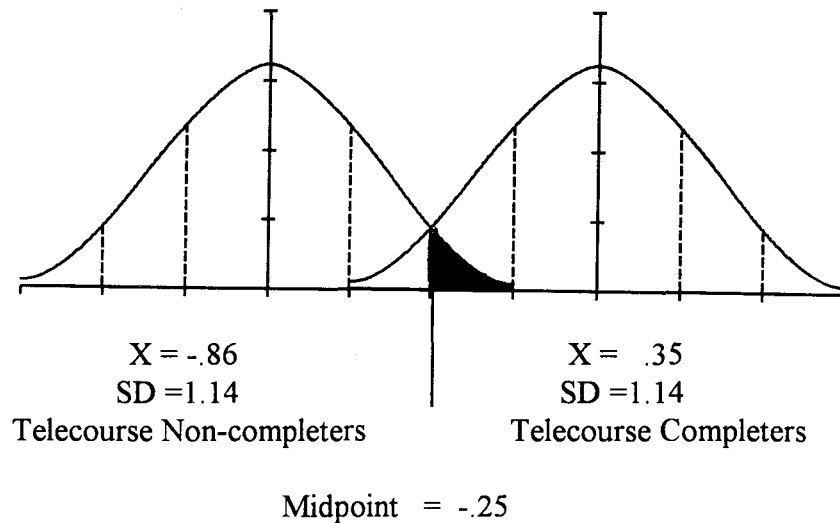
Unless there were no overlap between predictor groups, there is a chance of misclassification. A large difference between criterion groups with respect to the predictor variable results in fewer errors of classification.

Since the scores for the two groups are assumed to be normally distributed, it was possible to calculate the probability of being misclassified into the wrong criterion group. This was accomplished by determining the proportion of the incorrect group's distribution that overlaps the obtained scores. Following this, ranges of scores were then used to determine each case's classification as completer or non-completer. Ranges for obtained scores from the TSPI are listed in Table 14.

The Z-scores were used to show the probability of a particular individual being classified in the wrong group based on the obtained score. If a subject were to obtain a classification score of -.26 and receive a classification of non-completer, this person would have a 41.3% chance of being misclassified. The score of -.26 falls into the region of overlap in the distribution (Table 13), where the risk of misclassification is very high. In another case, a subject could receive a score of 2.40 on the TSPI and be classified as a completer with only a 1.8% chance of being misclassified.

Table 14.--Telecourse Completer and Non-Completer Group Classification Table

Obtained Score Range	Predicted Group	Probability of Incorrect Classification
> +3.00	Completer	< .4%
2.70	Completer	.9%
2.40	Completer	1.8%
2.10	Completer	3.3%
1.80	Completer	5.6%
1.50	Completer	9.5%
1.20	Completer	14.7%
.90	Completer	27.7%
.60	Completer	30.2%
.30	Completer	39.8%
.00	Completer	47.2%
- .25	Cutoff Score	40.9%
- .30	Non-completer	39.4%
- .60	Non-completer	29.5%
- .90	Non-Completer	21.5%
-1.20	Non-completer	14.5%

Table 14: Continued

-1.50	Non-completer	9.7%
-1.80	Non-Completer	5.6%
-2.10	Non-completer	3.1%
-2.40	Non-completer	1.8%
-2.70	Non-Completer	.7%
-3.00	Non-completer	.3%

Linear Discriminant Analysis

A linear discriminant analysis procedure was performed to test the ability of the TSPI to correctly classify cases based on telecourse completion or non-completion. A Box's M test of multivariate significance was performed to test the homogeneity of the covariance matrices. This was done to meet the assumption of linearity required by the discriminant analysis procedure. The results are presented in Table 15.

Hit Rates for Completer/Non-Completer Groups

To determine the accuracy of the TSPI in predicting completion/non-completion group membership, hit rates were calculated for the subjects. The results are depicted in Table 15.

A hit rate of 76.19% was obtained for the entire population. There were 165 cases in the completer group and 90.3% of those cases were correctly classified. In the non-completer group, there were 66 cases and 40.9% were correctly classified.

As the results indicate, the classification of telecourse completers was quite successful, while the inventory had difficulty correctly classifying non-completers. This suggests that individuals who were unsuccessful in the telecourse had scores that were higher than predicted. Perhaps these individuals have the potential for telecourse success, and the failure they experienced was not consistent over time.

Table 15.--Hit Rates Classification into Completer and Non-Completer Groups

| Group Membership | N | Predicted Group Membership | |
		Completers	Non-completers
Telecourse Completer	165	149 (90.3%)	16 (9.7%)
Telecourse Non-Completer	66	39 (59.1%)	27 (40.9%)

Percentage of groups correctly classified: 76.19%

Box's M = 3.93   F = 3.91   Significance p < .05

Telecourse Success and Attribution Style

An Analysis of Variance procedure was performed to test for the effect of attribution on telecourse grades. The findings are reported in Table 16. Students achieved one of 5 grade categories with "1" on the low end indicating failure or withdrawal, and "5" at the high end indicating an "A" grade. When completing the TSPI, students attributed academic failure or success to attribution variables of ability, effort, task difficulty, and luck. There was a total of 8 attribution variables summed for each student in calculating the individual score.

Significant differences were found between student telecourse grades with regard to ability/success, $F = 2.95$, $p < .02$, ability/failure, $F = 4.87$, $p < .001$, and effort/success, $F = 5.64$, $p < .002$ (Table 16). There were no significant differences found between student grades and attributions to effort/failure, task difficulty/success, task difficulty/failure, luck/success, or luck/failure.

Table 16.--Analysis of Variance Results: Mean Score by Attribution

Variable	DF	SS	MS	F	Sig.
Ability/Failure	4	264.56	66.13	4.87	.001
Ability/Success	4	557.04	47.24	2.95	.021
Effort/Failure	4	118.93	29.73	1.44	.223
Effort/Success	4	197.39	49.35	5.64	.002
Luck/Failure	4	64.10	16.03	1.76	.138
Luck/Success	4	86.37	21.59	1.34	.257
Task Difficulty/Failure	4	91.94	22.96	2.81	.059
Task Difficulty/Success	4	16.45	4.11	.46	.765

$N = 231$ in analyses

Table 17 contains a summary of group means for the three significant results. Tukey's HSD, a multiple comparison procedure, was performed to identify significant differences in group means. In examining group means for significant results (Table 18), in the ability/failure situation, students in the "F" or "W" grade category with a mean of 10.86 differed significantly from students with a grade of "A" and a group mean of 7.76, "B" with a mean of 8.04, and "C" with a mean of 8.54. These results indicate that students receiving a failing grade or withdrawing from a telecourse were more likely to attribute academic failure to lack of ability. Students receiving higher grades were less likely to make this attribution.

In the ability/success situation, Tukey's HSD (Table 19) revealed significant differences between the grade level "D" with a mean value of 18.01 and the grade level "F/W" with a mean of 13.57. Students receiving a grade of D were more likely to attribute academic success to ability than were students receiving a failing grade or withdrawing from the telecourse. No other significant group mean differences were revealed.

In the effort/success situation, Tukey's procedure (Table 20) displayed significant differences between students receiving an "F/W" grade with a mean of 16.71 and those receiving grades of "A" with a mean of 19.61 , "B" with a mean of 18.76, and "C" with a mean of 18.29. These results suggest that students with higher grades were most likely to attribute academic success to effort than students receiving a failing grade or withdrawing from a telecourse.

Table 17.--Descriptive Summary of Significant Results: Attribution by Telecourse Grades

| Telecourse Grades Achieved | N | Ability/Fail | Mean Values for | |
			Ability/Success	Effort/Success
A	41	7.76	17.43	19.61
B	72	8.04	16.36	18.76
C	52	8.54	15.73	18.29
D	24	8.75	18.01	17.79
F/Withdrawal	42	10.86	13.57	16.71
Total	231	8.69	16.18	18.33

Table 18.--Results of Tukey's HSD: Ability/Failure Attribution by Telecourse Grades

Group Mean Values		A	B	C	D	F/W
7.76	A					
8.04	B					
8.54	C					
8.75	D					
10.86	F/W	*	*	*		

* Indicates a significant difference between groups
Significance level: $p < .05$

Table 19.--Results of Tukey's HSD: Ability/Success Attribution by Telecourse Grades

Group Mean Values		A	B	C	D	F/W
17.43	A					
16.36	B					
15.73	C					
18.01	D					*
13.57	F/W					

* Indicates a significant difference between groups
Significance level: $p < .05$

Table 20.--Results of Tukey's HSD: Effort/Success Attribution by Telecourse Grades

Group Mean Values		A	B	C	D	F/W
19.61	A					*
18.76	B					*
18.29	C					*
17.79	D					
16.71	F/W					

* Indicates a significant difference between groups
Significance level: p < .05

Telecourse Success and Motivation

Will students who are more motivated achieve higher telecourse grades? According to the results of the Analysis of Variance comparing telecourse grades by motivation scores from the TSPI, this appears to be true. A significant difference between the mean telecourse grades by motivation score from the TSPI was found. Table 21 reports a significant $F = 14.06$, $p < .001$ when assessing the effect of motivation scores on telecourse grades.

Table 21.--Analysis of Variance Results: Mean Scores by Motivation

N	DF	SS	MS	F	Sig.
231	4	4423.66	1105.92	14.06	.001

Cell means for telecourse grades by motivation score are summarized in Table 22. Tukey's HSD was performed to test for significant differences among means. As indicated in Table 23, students receiving an A in a telecourse with a group mean of 82.90 differed significantly in motivation score from students in groups receiving a "C" with a mean of 75.81, a "D" with a mean of 71.21, and an "F/W" with a mean of 70.74. Students receiving a grade of "B" with a mean of 79.57 differed significantly from students receiving grades of "D" or "F/W". Students in the "C" group differed significantly from students in the "F/W" group. The results clearly indicate that students who received higher grades in telecourses scored higher on the TSPI's motivation section. These results suggest that students who are more highly motivated to achieve are more likely to be successful in telecourse study.

Table 22.--Descriptive Summary: Motivation Scores by Telecourse Grades

Telecourse Grades Achieved	N	Mean
A	41	82.90
B	72	79.57
C	52	75.81
D	24	71.21
F/Withdrawal	42	70.74
Total	231	76.84

Table 23.--Results of Tukey's HSD: Motivation by Telecourse Grades

Group Mean Values		A	B	C	D	F/W
82.90	A			*	*	*
79.57	B				*	*
75.81	C					*
71.21	D					
70.74	F/W					

* Indicates a significant difference between groups
Significance level: p < .05

Telecourse Completion and Demographics

The effect of demographic factors such as age, education level, employment, race, and sex on telecourse completion was examined. An Analysis of Variance was performed to compare telecourse completer/non-completer group membership with the above demographic factors. Table 24 lists the results of the analyses. Significant differences between completer and non-completer group means were not found with regard to any demographic factors examined at p < .05.

Table 24.--Analysis of Variance Results: Mean Scores by Demographics

Variable	DF	SS	MS	F	Sig.
Age	4	1.44	28.72	1.44	.210
Education level.	4	.40	.13	.65	.586
Employment	4	.83	.21	1.01	.400
Race	4	2.02	.40	2.04	.070
Sex	4	.01	.04	.02	.896

N = 231 in all analyses

Telecourse Success and History

The effect of previous telecourse completion on telecourse grades was assessed. An Analysis of Variance was performed to test for significant differences between the group grade means of telecourse students based on their previous telecourse completion. Table 25 reports the results. A significant difference was found between student telecourse grades based on previous telecourse completion. $(F = 8.91, p < .001)$.

Table 25.--Analysis of Variance Results: Mean Scores by Previous Telecourse
Completion

N	DF	SS	MS	F	Sig.
231	4	36.49	9.12	8.91	.001

Cell means for telecourse grades by telecourses previously completed are summarized in Table 26. Tukey's HSD was performed to test for significant differences among means. As indicated in Table 27, students receiving a "B" in a telecourse with a group mean of 1.73 differed significantly from students in groups receiving an "F/W" with a mean of .57, and a "C" with a mean of 1.19.   Students in the "A" group with a mean of 1.21 and the "C" group with a mean of 1.19 also differed significantly in the number of previous telecourses completed from students in the "F/W" group. The results suggest that individuals who withdraw or do poorly in telecourses are less likely to have had previous successful telecourse experience. Current successful completers are more likely to have had a positive telecourse experience in the past.

Table 26.--Descriptive Summary: Previous Telecourses Completed by Telecourse Grades

Telecourse Grades Achieved	N	Mean
A	41	1.23
B	72	1.73
C	52	1.19
D	24	1.12
F/Withdrawal	42	.57
Total	231	1.25

Table 27.--Results of Tukey's HSD: Previous Courses Completed by Telecourse Grades

Group Mean Values		A	B	C	D	F/W
1.23	A					*
1.73	B			*		*
1.20	C					*
1.12	D					
.57	F/W					

* Indicates a significant difference between groups
Significance level: p < .05

Telecourse Success and Study Habits

Is there a significant difference in the study habits of successful and unsuccessful telecourse students? To evaluate this question, an Analysis of Variance was performed evaluating the effect of study habits on student grades.   On the TSPI, students were asked to indicate how often they watched the videotapes or read the text. In each question, students could choose from answers of consistently, occasionally, or never. Their responses were scored by assigning a "3" at the high end to consistently, a "2" to occasionally, and a "1" to never at the low end. The results of the Analysis of Variance are in Table 28. With regard to use of text, a significant difference in group means was found with $F = 6.23$, $p < .001$. With regard to the use of video, significant results were also found with $F = 14.30$, $p < .001$.

Table 28.--Analysis of Variance Results: Mean Scores by Study Habits

Variable	DF	SS	MS	F	Sig.
Text	4	13.09	3.27	6.23	.001
Videotape	4	28.15	7.04	14.30	.001

N = 231 in all analyses

Table 29 contains cell means for both the video and text conditions. Tukey's procedure (Table 30) was performed and revealed that students receiving a grade of "F/W" with a mean of 1.43 differed significantly in video use from students receiving a grade of "A" with a mean of 2.32, "B" with a mean of 2.34, "C" with a mean of 2.25 and "D" with a mean of 1.92. Students receiving a "B" grade also differed significantly in videotape habits from students receiving a grade of "D" with a mean of 1.92.

When considering use of text, Turkey's procedure (Table 31) indicated that students receiving a grade of "F/W" with a mean of 1.74 differed significantly in text use form students receiving a grade of "A" with a mean of 2.30, "B" with a mean of 2.42, and "C" with a mean of 2.24.

The results imply that students who consistently watch course videotapes and read the text are more likely to successfully complete telecourses than students who occasionally or never use this material.

Table 29.--Descriptive Summary: Study Habits by Telecourse Grades

Telecourse Grades Achieved	N	Mean Values for Video	Text
A	41	2.32	2.30
B	72	2.34	2.42
C	52	2.25	2.24
D	24	1.92	2.16
F/Withdrawal	42	1.43	1.74
Total	231	2.12	2.21

Table 30.--Results of Tukey's HSD: Video Use by Telecourse Grades

Group Mean Values		A	B	C	D	F/W
2.32	A					*
2.34	B				*	*
2.25	C					*
1.92	D					*
1.43	F/W					

* Indicates a significant difference between groups
Significance level: $p < .05$

Table 31.--Results of Tukey's HSD: Text Use by Telecourse Grades

Group Mean Values		A	B	C	D	F/W
2.30	A					*
2.42	B					*
2.24	C					*
2.16	D					
1.74	F/W					

* Indicates a significant difference between groups
Significance level: $p < .05$

CHAPTER V

DISCUSSION

The major research question addressed by this study concerns the need to develop an inventory that predicts student completion of telecourse study. To accomplish this, the Telecourse Success Prediction Inventory was developed and administered to individuals who had registered for a telecourse at Triton College.

This study also addressed several secondary questions. The first of these asks if attribution or motivation significantly effect telecourse grades. The second research question examines the effect of demographic factors on telecourse completion. Finally, the third secondary question examines the effect of study habits and previous telecourse completion on grades.

This Chapter begins by interpreting the data related to the reliability, validity, and effectiveness of the Telecourse Success Prediction Inventory. Following this, data concerning the three secondary research questions is described and interpreted. Conclusions are drawn from the findings and the limitations of the research are discussed. Finally, recommendations for further research based on this study is described.

<u>Prediction of Telecourse Success</u>

As distance education and telecourse study expands, colleges and universities must face the unresolved issue of increased attrition that they bring with them. Telecourses at Triton College have experienced an attrition rate as high as 62% in telecourses.

The prediction of attrition in telecourse students is difficult. Telecourse students are less likely to have contact with instructors, counselors, or advisors. Due to their isolation, it is difficult for the educational institution to anticipate or attempt to resolve the concerns of these distant students.

Research reveals that the majority of telecourse studies focus on several primary areas when assessing student drop-out or poor performance in distance education or telecourse study. These areas are institutional support, student characteristics, and student demographics. Currently there is no scale available that predicts telecourse or distance education completion.

When considering the underlying causes of telecourse attrition, questions are raised. Are there underlying student characteristics that might predispose their completion or non-completion of telecourse study? Is it possible to develop a method of identifying individuals who might be at risk for telecourse failure prior to their registering for such courses?

Persistence in distance education is likely to result from the complex interrelationship between the student and the educational environment. Prior research has identified student attribution style, achievement motivation, and institutional support as potential predictors of academic success. An instrument based on these underlying

principles used to predict telecourse completion would be a valuable tool for colleges to use in identifying at-risk students.

The purpose of this study was to develop a valid, reliable instrument that could effectively predict telecourse completion. The inventory developed attempts to measure the combined effects of student attribution style, motivation, and use of institutional support on telecourse completion. Validity and reliability values were established for the inventory and its ability to successfully discriminate between telecourse completers and non-completers was established.

The Telecourse Success Prediction Inventory

A pilot study was conducted in September and October of 1994 that identified attribution style, motivation, and institutional support as effective factors in discriminating between telecourse completers and non-completers. This pilot study identified 32 attribution items, 20 motivation items, and 7 components of institutional support that comprise the Telecourse Success Prediction Inventory (TSPI). The three factors hypothesized as underlying predictors are an attribution construct, a motivation construct, and influence from institutional support.

A Likert-type rating system was used throughout the inventory. Scoring consisted of assigning a "5" at the high end for true responses and a "1" at the low end for false responses. Weightings for the inventory items were developed using linear discriminant analysis. The discriminant analysis procedure maximizes the difference between group

scores. The obtained scores resulting from the procedure were then used to classify

students as telecourse completers or non-completers.

Descriptive Findings

The study was conducted with telecourse students from Triton College. Eight-

hundred subjects were randomly chosen from a pool of 1,605 individuals who had

registered for a telecourse. The surveys were mailed to the individuals chosen to

participate. An additional 200 surveys were distributed to telecourse students by Triton's

Media Center. The total number of surveys received was 284 with an overall response rate

of 28%. The response rate from successful students who had received a grade of "A",

"B", or "C", was 41%. The response rate from unsuccessful students with a grade of "D",

"F", or Withdrawal was only 22%. The response rate is lower than expected in both

groups and is due to the fact that participation was voluntary. An additional explanation

for this occurrence can be found in the nature of distance education. Telecourse students,

particularly unsuccessful ones, feel less a part of the college community and are less likely

to participate in studies than students in traditional courses.

Descriptive Summary

A descriptive analysis of the successful and unsuccessful telecourse classification

scores revealed that 29% of the cases included in the study were in the telecourse non-

completer category and that 71% were in the completer category (Table 3). Linear

discriminant analysis was performed to obtain item weightings for scoring the inventory

and classifying subjects into groups. Non-completers were found to have a mean obtained score on the TSPI of -.85 while completers had a mean score of .34 (Table 6). A cutoff score used to place students in groups with the midpoint between these two mean values at -.25. Analysis of Variance revealed a significant difference between the two classification mean scores (Table 7). This was expected as the goal of the discriminant analysis procedure is to maximize the difference between the group mean scores.

Inventory Validity

The criterion related validity of the TSPI was determined by ETA correlations between the classification groups of completers and non-completers and the derived discriminant scores for the TSPI. The results depicted in Table 8 indicated a significant relationship between discriminant scores and telecourse completion (ETA = .482, Power > .99). This positive correlation indicates that a significant relationship exists between the TSPI classification scores and the subjects' telecourse completion history.

Inventory Reliability

The Spearman-Brown Split-half reliability procedure was used to analyze the reliability of the TSPI. A sample of 50 cases, 25 from each group, were randomly chosen from the 231 subjects included in the research. Scores from each item on the inventory were included in the reliability test. A reliability coefficient of .588 was obtained for the telecourse support inventory, .534 for the attribution inventory, and .667 for the motivation inventory (Tables 9, 10, and 11). Although statistically significant at $p < .05$,

these values are lower that the preferred rate of .80. Further analysis of additional cases may provide a higher reliability coefficient for the TSPI.

Classification Table Development

A classification table for the population was developed by calculating the midpoint between the completer and non-completer group means. This midpoint is also the cutoff score used to determine group membership based on each obtained inventory score. A Classification Table indicating the probability of being classified in the wrong group was developed using ranges of scores (Table 14). A subject receiving a score of -3.00 (non-completer) on the TSPI has only a .3% chance of being misclassified as a completer. A subject receiving a score 0f -.30 (non-completer), which is nearer the midpoint, would have a 39.4% chance of being misclassified as a completer.

Were the inventory used as an evaluation tool in the future, it would be possible to lower the risk of misclassification of telecourse non-completers by shifting cutoff scores for inclusion in a telecourse preparation program to obtain an acceptable probability level. If the cutoff score was shifted to a 1.50, an individual receiving this score on the TSPI would have a 9.5% chance of being misclassified as a completer when really a non-completer.

Linear Discriminant Analysis

Linear discriminant analysis was performed to test the ability of the TSPI to correctly classify cases based on telecourse completion or non-completion. A Box's M

test of multivariate significance was performed to test the homogeneity of the covariance matrices. This was done to meet the assumption of linearity required by the discriminant analysis procedure.

Hit rates, or the TSPI's rate of success in correctly classifying subjects, were calculated using linear discriminant analysis. The results are presented in Table 15. An overall hit rate for the entire population was 76.19%. The TSPI was able to correctly classify 76.19% of the cases into the right group. There was a large discrepancy in the TSPI's ability to correctly classify completers and non-completers. The TSPI was very successful in correctly classifying completers with 90.3% of the cases correctly classified. The TSPI was considerably less successful in classifying non-completers with only 40.9% correctly classified. This means that 59.1% of the subjects who were in the non-completer category were incorrectly classified as completers. These individuals scored higher on the TSPI than expected. Perhaps these individuals possess characteristics needed for success, but another extenuating variable is causing them to either withdraw or do poorly in telecourses. Another explanation for this difference may the unequal group size. The total number of non-completers in the study was 66 while there were 165 completers. The inclusion of more subjects in the non-completer group would be likely to increase this group's hit rate.

<center>Secondary Research Questions</center>

Telecourse Success and Attribution Style

Subjects made causal attributions in response to situations of academic success or failure to four causal variables: ability, effort, task difficulty, and luck. A total of 8 attribution variables were summed for each student to arrive at their individual score. When comparing students grouped according to their actual telecourse grades on attribution style, Analysis of Variance revealed a significant difference between groups with regard to ability attributions in both academic success ($F = 2.95$, $p < .02$) and failure situations ($F = 4.87$, $p < .001$). Significant effects were found for effort attributions in the success situation only ($F = 5.64$, $p < .002$). The results are summarized in Table 16.

Multiple comparisons indicated that in the condition of attribution to ability in a failure situation, the F/Withdrawal group differed significantly from those achieving an "A", "B", or "C" in a telecourse (Table 18). This indicates that subjects failing or withdrawing from telecourses are most likely to attribute the failure to a lack of ability. Weiner (1986) found that this attribution style is consistent with a low need for achievement. This also supports the attribution model of Anderson and Arnoult (1985, pp. 246-247) that describes success expectancies as a function of attribution. When a person attributes a failure experience to a lack of ability, success expectancy decreases. Failure becomes expected and there is no perceived possibility of improvement. The authors contend that low success expectancies lead to low motivation and low persistence. A general lack of effort to learn how to do better becomes typical. Such a behavior pattern will lead to an even higher failure rate.

Multiple comparisons in the condition of attribution to ability in the success situation indicated that mean values for students receiving a grade of "D" differed significantly from those receiving a grade of "F/W" (Table 19). No other significant mean differences were found. This fails to support Weiner's (1979) findings that individuals attributing academic success to internal factors of ability are more likely to experience future academic success. Successful students in this study were not more likely to attribute academic success to the internal, stable factor of ability. It is interesting to note that students receiving a low but passing grade of "D" were most likely to make this attribution.

Multiple comparisons of group means in the effort/success condition revealed that the groups means for grade levels of "A", "B", and "C" were significantly higher than those of students in the "F/W" category (Table 20). This supports the findings of Weiner (1979) that expectancy for future success in an academic situation was higher following an attribution to the internal cause of effort. Students who felt that academic performance was due to an internal factor which they could control (effort), were more likely to experience future academic success. As noted earlier, Weiner (1979) included an internal attribution to ability as another precursor to future academic success. The results of this study did not support attribution to this internal, stable factor as a contributor to academic success, but did find that the internal, unstable factor, effort was a contributor.

Telecourse Success and Motivation

The TSPI evaluates the motivation style of telecourse students in Part III of the inventory. Students responded to 20 inquiries related to McClelland's (1976) personal characteristics of individuals high in achievement motivation. An Analysis of Variance investigating the effect of motivation on telecourse grades revealed a significant difference between the means scores of students on the motivation portion of the TSPI ($F = 14.06$, $p < .001$). These results are listed in Table 21. Multiple comparisons showed that students receiving a grade of "A" had significantly higher motivation scores than those receiving an grade of "C", D", or "F/W" (Table 23).

These findings support previous research (French and Thomas, 1958; Altman, 1990) linking this variable to academic achievement. Motivation is a particularly important characteristic for distance education students to possess in light of McClelland's (1982, p. 231) findings that internal drive as opposed to external supervision is a critical factor in performance of those high in n achievement. These findings suggest that telecourse students who are highly motivated may perform at an even higher degree due to the lack of external supervision in non-traditional education. In opposition, students low in motivation may find non-traditional courses even more challenging than those held in a traditional classroom due to a lack of this characteristic. It appears that telecourse students' ability to set goals, determine how to reach them, use data for decision making, delay rewards, take risks, and assume personal responsibility for their own behavior contributes to success in coursework.

Telecourse Completion and Demographics

Telecourse completion and demographic factors including age, education level, employment, race, and sex were examined. An Analysis of Variance was performed and failed to show significant differences between telecourse completer/non-completer group means with regard to any demographic factors examined. Table 24 lists the results of the analysis. This supports the research findings of Coldeway and Spencer (1980) and Foley (1993) who did not find demographic factors to have a significant effect on distance education completion.

Telecourse Success and History

The effect of previous telecourse completion on telecourse grade achievement was examined. An Analysis of Variance was performed to test for significant differences between mean student grades and the number of telecourses they had previously completed. Table 25 reports the results. A significant difference, $F = 8.91$, $p < .001$, was found between student telecourse grades with regard to previous telecourse completion.

Multiple comparisons indicated group means of grade levels "A", "B", and "C" were significantly higher than those at the "F/W" level (Table 27). In addition, students receiving a grade of "B" also completed significantly more telecourses than those achieving a "C". This supports the conclusions of Greenberg (1981) and Coggins (1988) who found previous academic performance to be a significant predictor of future performance in distance education. Students who have previous academic success in telecourses are more likely to have continued success.

Telecourse Success and Study Habits

On the TSPI, students indicated how often they watched videotapes or read the text. Answers ranged from a score of "3" for consistently, "2" for occasionally, or "1" for never. The results of Analysis of Variance procedures to test the effect of study habits on telecourse grades (Table 28) were significant with F= 6.23, p < .001 for use of text and F = 14.30, p < .001 for use of videotape.

A multiple comparison of means revealed that in the text condition, students in the "A", "B", and "C" groups had mean values significantly higher than those in the " "F/W" category (Table 31). In the videotape condition, the means of students in the "F/W" condition were significantly lower than all other categories (Table 30). In addition, students receiving a telecourse grade of "B" watched the videotapes significantly more consistently than those who received a grade of "D". The results imply that that students who watch the videotapes and read the text are more successful in telecourse study. Students who watch the videos in telecourses are more likely to at least get a passing grade of "D" rather than fail or withdraw the course.

Conclusions

Telecourse study provides those unable to attend traditional courses with an excellent opportunity to pursue higher education. This form of study does require students to take responsibility for their education. Telecourse study offers the student little opportunity for regular contact with the instructor, encouragement, or support. Highly motivated students with excellent organization and study skills can be successful in

telecourse study. At the same time, the "high risk" student who engages in telecourse study may not fare as well. Failing or withdrawing from a telecourse may be so discouraging for the "at risk" student that this individual does not make further attempt at higher education.

There is a need to identify and counsel students prior to their embarking on telecourse study. Verduin and Clark's model for distance education instruction (1991, p. 156), lists assessing incoming behavior as the first step in distance education learning. They describe such an assessment as one that "looks beyond the students' present knowledge and skills." They recommend the assessment of motivation, learning style, tendencies, preferences, competence, self-directedness, and past experience prior to entry in distance education. By understanding students' needs and goals, both educators and students can clarify readiness for distance education.

A key component to assessment is a reliable, valid instrument that can accurately predict the potential for telecourse completion. There is currently no instrument available that predicts telecourse or distance education success. To fill this void, the Telecourse Success Prediction Inventory was developed and tested.

In this study, the TSPI has been shown to be a valid and moderately reliable inventory for predicting telecourse completion in students at Triton College. The validity of the instrument was demonstrated by the ETA correlations between inventory scores and telecourse completion. Reliability was established by correlations obtained using the Spearman-Brown Split-half reliability analysis.

Additional questions addressed by the study examine the effect of attribution, motivation, study habits, telecourse completion, and demographic factors on telecourse grades and completion. The examination of the individual effect of these variables on telecourse completion and success provides valuable information that can be used to revise and improve the instrument.

When examining the results of the attribution effect, it is interesting to note than only two attribution conditions, ability/failure and effort/success seemed to effect student success in telecourse study. Students attributing academic failure to lack of ability were more likely to do poorly in telecourses. Students attributing academic success to effort did well. It appears that students attributing success to an internal factor (effort) that they can both control and change over time, were more likely to be successful. On the other hand, students attributing failure to an internal factor (ability) that is stable and not easily changed are more likely to be unsuccessful. Students who attributed academic success to hard work applied this belief to telecourse study and succeeded. Students who attributed poor academic performance to a lack of ability to do the work applied this belief to telecourse study and did poorly.

Motivation also demonstrated a strong effect on telecourse success. Overall, the higher the motivation score a student had, the better their performance in telecourse study at Triton College. It is logical to assume that someone who is able to set goals, achieve them, delay gratification, and learn from mistakes would perform well in a self-directed learning environment. Motivation appears to be an effective predictor of telecourse success.

The number of telecourses previously completed also had a positive effect on telecourse success. It is interesting to note that the demographic factor, education level, did not have a significant effect on telecourse completion in this study. This may have been due to the fact that only 16% of the students in the study had attained a previous degree. Other researchers, (Rekkedal, 1983 and Greenberg, 1981) have found prior academic success a significant predictor of distance education performance. The current study did show that students are more successful in telecourse study if they have previously demonstrated such success. This finding also contributes to the need for assessment of incoming students who have not had prior telecourse experience. These individuals, in part due to their lack of expertise in telecourse study, are at higher risk for failure or withdrawal.

The study habits of telecourse students also demonstrated an effect on success. Students who are more consistent about reading the text and watching the videotapes achieved higher grades. It is logical that students with better study habits perform at a higher level in an academic situation. These finding also support the need for early intervention with "at risk" students. Bajtelsmit (1990, p. 189) supports the need to identify and provide compensatory intervention for students for whom distance education would be less effective. Students who are at-risk are also likely to have poor study habits. Participation in a college preparation course that teaches study skills prior to embarking on telecourse study may increase their chance of success.

Demographic factors were not found to have a significant effect on telecourse completion in this study. These results suggest that the prediction of telecourse success

cannot be based on a series of superficial individual characteristics. Instead, such prediction should be based on the underlying characteristics that effect behavior.

Limitations

Developing and testing the TSPI represents a ground-breaking attempt to create an instrument to predict telecourse success. With this premise in mind, the current study was successful. Yet, several limitations are evident. Participation in the study was lower than expected. Telecourse students, particularly those who have withdrawn from or failed a course, are not predisposed to complete and return surveys. An alternative to mailed surveys was explored by distributing surveys through Triton's Media Center, but return rates were even lower in this situation. In addition, only successful students were reached through the Media Center. Perhaps a solution to this problem would be to involve telecourse instructors in the process. Surveys mailed with letters from telecourse instructors requesting their participation might be more effective. This method would of course depend on the willingness of telecourse instructors to provide support.

Another factor limiting participation in the study may have been the length of the survey. Students were asked to voluntarily complete four pages consisting of fifty-nine questions in this study. The length of the survey may have been overwhelming, particularly for less successful students. By focusing on those variables that had the greatest effect in this study such as motivation, attribution to ability and effort, study habits, and telecourse history, it may be possible to reduce the length of the inventory and at the same time increase its validity.

The reliability of the inventory was lower than expected. This may have been due to the inclusion of only fifty randomly chosen cases in the analysis. After reducing the length of the inventory, perhaps reliability would be higher if additional cases were included. Other methods of testing reliability such as test-retest may also be performed to further explore this area.

Overall, the research methodology used in developing and testing the TSPI showed promising results. Most importantly, this study provides a basis for further refinement of the prediction of telecourse completion.

Recommendations for Further Study

The current study represents an initial attempt to develop an instrument that predicts telecourse completion. As it is, this research acts as an excellent model for continued exploration of this field. Below are recommendations for improvement of both the TSPI and the methodology used to test it:

1. Eliminate the attribution variables that were not associated with telecourse success such as task difficulty and luck. Focus on variables that were associated with telecourse success such as attributions to ability and effort, motivation, study habits, and telecourse history. By focusing on important variables and eliminating less important ones, more stable results may occur.

2. Increase the participation rate in future projects, particularly with those in the non-completer group. A larger sample must be analyzed to prove the TSPI's ability to accurately classify this group.

3. Enlist the support of telecourse instructors in recruiting participants.

4. Establish reliability with the inclusion of a large sample when using the the Spearman-Brown Split-half reliability measure. Add reliability testing in the form of a test-retest procedure to further explore this area.

5. Test the revised TSPI on other populations such as telecourse students at other community colleges or at universities. Then expand the population to include students in other forms of distance education such as computer assisted instruction, satellite training, and written self-study programs.

Appendix 1: The Telecourse Success Prediction Inventory

STUDENT INFORMATION

To assist us in successfully evaluating the results of your survey, please complete the information below:

Part I: Demographic Information

Name:_____   Date:_____
Circle the correct answer or category below:
Age: 17-24   25-34   35-44   45-54   55&above   Sex: M   F
Employment: Full-time   Part-time   Not working
Race: Caucasian   African American   Hispanic   Other
Education level Completed:
High School/GED   Bachelor's Degree
Two-year College Degree   Master's Degree

Part II: Telecourse Registration/Completion

Which telecourse(s) have you registered for during the current or Fall 1994 semester?
Telecourses   Expected Grade(s)
_____   _____
_____   _____
Number of Telecourses Completed: 0   1   2   3   4   5
Grade(s) Received:_____

Part II: <u>Continued</u>

Did you watch the videotapes: Consistently   Occasionally   Never

Did you read the textbook: Consistently   Occasionally   Never

Why did you choose to take a telecourse rather than a traditional course?_____

_____

Part III: Telecourse Support

Place a check by the following if you experienced them when taking telecourses. Also, indicate the degree to which each activity was positive or negative for you.

	Positive	Negative
____ Attended Course Orientation	O-O-O-O-O	
____ Telephone Contact with Instructor	O-O-O-O-O	
____ Telephone Contact with Tutor	O-O-O-O-O	
____ Face-to-face Contact with Instructor	O-O-O-O-O	
____ Face-to-face Contact with Tutor	O-O-O-O-O	
____ Written Contact with Instructor	O-O-O-O-O	
____ Regular Feedback from Instructor	O-O-O-O-O	

ATTRIBUTION SCALE

Carefully read each statement below concerning academic performance. After each statement are four causes. Indicate the degree to which you believe each cause is true or false for you. Be sure to color in one circle for each cause listed.

A. You have withdrawn from a course because you believe you cannot pass it. This has occurred because:

		true	false
1.	You lack the ability to do the work required.	O-O-O-O-O	
2.	The course is more difficult than it should be.	O-O-O-O-O	
3.	Something unforeseen has happened in your personal life that you cannot control.	O-O-O-O-O	
4.	You have not put enough effort into the course.	O-O-O-O-O	

B. You have successfully completed all your courses this semester in college. This is because:

		true	false
1.	You have a natural aptitude for college work.	O-O-O-O-O	
2.	You have worked very hard to do well this semester.	O-O-O-O-O	
3.	The courses you took were not difficult.	O-O-O-O-O	
4.	You were very lucky and did well.	O-O-O-O-O	

C. You have recently received a good grade in a difficult course. This was because:

		true	false
1.	You were very lucky.	O-O-O-O-O	
2.	The teacher was an easy grader.	O-O-O-O-O	
3.	You had the ability to do well in the course.	O-O-O-O-O	
4.	You worked very hard.	O-O-O-O-O	

D. You read the course materials or viewed the videotapes for a course and do not understand them. This is because:

		true	false
1.	The materials are poor quality	O-O-O-O-O	
2.	You lack the ability needed to understand them.	O-O-O-O-O	
3.	A chance occurrence in your life has come up.	O-O-O-O-O	
4.	You did not read or view the material carefully enough.	O-O-O-O-O	

E. You wrote a term paper for a class and received a good grade. This is because:

		true	false
1.	You worked hard on the paper.	O-O-O-O-O	
2.	You have the writing skills needed to do this paper.	O-O-O-O-O	
3.	Good luck resulted in your success.	O-O-O-O-O	
4.	The instructor gave you help and encouragement.	O-O-O-O-O	

F. You have been given a research assignment in the library and cannot find any information on the subject assigned to you. This is because:

		true	false
1.	You do not know how to use the library.	O-O-O-O-O	
2.	The material has been lost or misplaced by the library.	O-O-O-O-O	
3.	You did not try hard enough to find the material.	O-O-O-O-O	
4.	Bad luck has kept you from completing the assignment.	O-O-O-O-O	

G. You have dropped out of college because your grades are too low. This is due to:

		true	false
1.	You haven't spent enough time completing assignments and studying.	O-O-O-O-O	
2.	You have had some bad luck that has made it impossible for you to do well in school.	O-O-O-O-O	
3.	You lack the ability to be successful in college.	O-O-O-O-O	
4.	The instructors did not supply enough support and guidance.	O-O-O-O-O	

H. You took a college course that required you to complete ten assignments by the end of the semester. At the end of the semester, you have completed all assignments as required. This is because:

		true	false
1.	Luck had a lot to do with your success.	O-O-O-O-O	
2.	The instructor provided a lot of support and guidance.	O-O-O-O-O	
3.	You have the ability to do the work required.	O-O-O-O-O	
4.	You put effort into completing the work.	O-O-O-O-O	

MOTIVATION SCALE

Carefully read each statement below. Indicate the degree to which each statement is true for you. Be sure to color in one circle for each statement.

		true				false
1.	I usually find it easy to make decisions.	O-O-O-O-O
2.	I find it difficult to complete homework assignments when I have the opportunity to spend time with my family and friends.	O-O-O-O-O
3.	When I decide to do something I usually go right out and do it.	O-O-O-O-O
4.	When something does not work out for me, I usually think about how I could be more successful next time.	O-O-O-O-O
5.	Before I make a decision, I usually consider all information available.	O-O-O-O-O
6.	I have definite goals that I am committed to achieve.	O-O-O-O-O
7.	The courses I am taking in college are unrelated to my career goals.	O-O-O-O-O
8.	I know exactly what I must do to be successful in college.	O-O-O-O-O
9.	I usually make decisions quickly without giving them a lot of thought.	O-O-O-O-O
10.	I tend to choose those activities that I am certain that I will be successful in.	O-O-O-O-O
11.	Learning in school is very important to me.	O-O-O-O-O
12.	I often doubt that I will be able to achieve my educational goals.	O-O-O-O-O
13.	I would feel very badly if I did not receive an A or B in a course.	O-O-O-O-O
14.	I am willing to sacrifice time with my family and friends to study.	O-O-O-O-O
15.	I often finish projects when I start them.	O-O-O-O-O

true   false

16. I am aware of areas in which I need to improve with regard to school.   O-O-O-O-O

17. I look for opportunities to challenge my abilities.   O-O-O-O-O

18. I have a clear idea of what I want to do in the future.   O-O-O-O-O

19. When I have difficulties in school, I can usually pinpoint the cause.   O-O-O-O-O

20. Before I make a decision, I first consider all the alternatives.   O-O-O-O-O

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The dissertation is therefore, accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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