

A COMPARISON OF THE LEARNING STYLES
OF AT-RISK STUDENTS AND
STUDENTS NOT AT RISK

A THESIS
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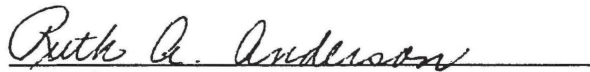
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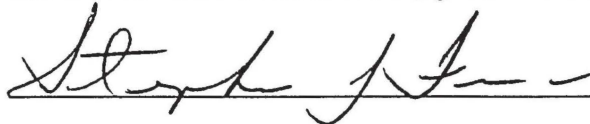
To the Dean for Graduate Studies and Research:

I am submitting herewith a thesis written by Bonnie L. Stayer entitled "A Comparison of the Learning Styles of At-Risk Students and Students Not At Risk." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Counseling and Guidance.



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We have read this thesis and
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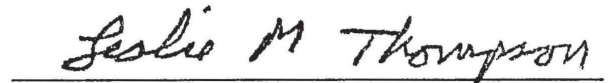





Department Chairperson


Dean of College of Education
and Human Ecology

Accepted


Dean for Graduate Studies and
Research

DEDICATION

To

Jon David

who chose to grow with me through this experience

ACKNOWLEDGMENTS

I would like to express my appreciation to Margaret Barnett who believed in me and the value of this research and made it possible for me to finish this project. I am also grateful to Dr. Rebecca Downing who encouraged me to continue when I had despaired of completing the project. I want to thank Vikki Massengill, Annette Stephens, Pat Clough, Nita Beane, and Carolyn Garling for giving of their class time to permit me to invite students to participate in the survey, and I am especially thankful to those students who completed the survey.

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The purpose of this study was to compare the learning styles of at-risk students and students not at risk. The procedure followed was first to obtain permission from the Human Subjects Review Committee, the high school principals, and the principal of the at-risk program to administer a learning styles inventory. Students in regular English classes (i.e., not honors or basic classes) volunteered by returning permission forms signed by themselves and a parent or guardian. The principal of the at-risk program required all of the students in the program to take the survey, therefore, permission forms were not signed by these students and their parent or guardian. The Learning Style Profile was administered to both groups of students. Data were analyzed by a multivariate t-test, using the BMPD program.

No statistically significant difference was found between at-risk students and students not at risk in any of the categories included in the profile. The lack of

statistical significant differences between these two groups in this study which is in contradiction to the results of several studies found in the literature would indicate the need for further research.

TABLE OF CONTENTS

DEDICATION.....	iii
ACKNOWLEDGMENTS.....	iv
ABSTRACT.....	v
LIST OF TABLES.....	ix
Chapter	
I. INTRODUCTION.....	1
Rationale for the Study.....	1
Statement of Problem.....	2
Research Question.....	3
Hypotheses.....	3
Statement of Purpose.....	4
Statement of Definition of Terms.....	4
Statement of Limitations of the Study.....	4
II. REVIEW OF LITERATURE.....	6
Dropping Out of School.....	6
Learning.....	9
Learning Style.....	10
At-risk Learners.....	18
Learning Style in the Classroom.....	22
Summary.....	26
III. METHODOLOGY.....	30
Subjects.....	30
Procedure.....	31
Instrumentation.....	32
Null Hypotheses.....	35
Statistical Analysis.....	35
IV. PRESENTATION AND ANALYSIS OF DATA.....	36
Results.....	37
Summary.....	45
V. SUMMARY AND CONCLUSIONS.....	47
Discussion.....	49
Conclusions.....	58

Implications.....	60
Recommendations.....	61
Summary.....	63
REFERENCES.....	66

LIST OF TABLES

Table

1	Multivariate <u>T</u> -test for Cognitive Variables...	38
2	Standard Deviation of Cognitive Variables.....	39
3	Multivariate <u>T</u> -test for Perceptual Response Variables.....	40
4	Standard Deviation of Perceptual Response Variables.....	41
5	Multivariate <u>T</u> -test for Study/Instructional Preference Variables.....	42
6	Standard Deviation of Study/Instructional Preference Variables.....	43
7	Multivariate <u>T</u> -test for Instructional Environment Preference Variables.....	44
8	Standard Deviation for Instructional Environment Preference Variables.....	45

CHAPTER I

INTRODUCTION

Rationale for the Study

In the past decade 25% of entering high school freshmen dropped out of school prior to graduation (Finn, 1987; Presley & Seifert, 1988; Vornberg & Ramsey, 1989). These students at risk of dropping out are characterized as having failing grades, a poor self-concept, and high absenteeism. At-risk students rarely participate in extra-curricular activities and often set very low and inadequate goals for themselves. They are usually from homes that are disrupted and have parents with a low education level and a low socioeconomic level. These students are also discipline problems who dislike school and feel alienated by the teachers and their peers. At-risk students, however, do not have a low intelligence quotient (IQ), but they have low test scores, low grades, have failed two or more courses by the beginning of the eighth grade, and are two years behind in reading and math skills (DeBlois, 1989; Dunham & Alpert, 1987; Finn, 1987; Presley & Seifert, 1988; Wittenberg, 1988). No single cause can be stated or agreed upon by the researchers for a student to become at risk of dropping out of school

(Vornberg & Ramsey, 1989), but learning style advocates suggest that one factor placing students at risk may be their personal learning style which is different from that of students not at risk and perhaps inconsistent with the teaching style of many traditional classroom teachers.

Learning style advocates claim that a mismatch between instructional method, classroom conditions, and the learning styles of students is the key to failure and the eventual dropping out of at-risk students (McCurdy, 1989; Vornberg & Ramsey, 1989). This study, therefore, will be conducted to determine the differences in learning styles between the at-risk student and the successful student. This study will be significant for four reasons: (a) to provide understanding to teachers to adjust their instructional methods to accommodate the learning styles of all students, including the at-risk students, (b) to help students understand their individual learning styles and use that knowledge to their advantage during classroom instruction and individual study time, (c) to enable counselors to better advise students in developing four year plans with regard for students' learning style elements, and (d) to provide a base for further research.

Statement of the Problem

Successful students learn through several modalities and are more flexible and adaptable to various types of

teaching methods. They are persistent in pursuing learning and successfully learn and retain information in ways that conventional education provides (McCurdy, 1989). Research indicates that many at-risk students have learning styles at odds with styles required to succeed in traditional educational systems. At-risk students are not flexible and adaptable to different types of teaching methods nor educational environments (Carbo & Hodges, 1988; Dunn & Dunn, 1979; McCurdy, 1989).

Research Question

The research question is: What are the characteristics of the learning styles of at-risk students and how are their learning styles different from successful students?

Hypotheses

- H1 There will be a statistically significant difference in the cognitive skills of at-risk students and students not at risk of dropping out of high school.
- H2 There will be a statistically significant difference in the perceptual responses to new information between at-risk students and students not at risk.
- H3 There will be a statistically significant difference in study/instructional preferences of at-risk students and students not at risk.
- H4 There will be a statistically significant difference

in instructional environment preferences of at-risk students and students not at risk of dropping out of high school.

Statement of Purpose

The purpose of this study is to determine the differences between the learning styles of at-risk students and the learning styles of successful students. Awareness of these different learning styles could provide an indication of possible reasons for failure among at-risk students in traditional classrooms.

Definition of Terms

Learning Style: Characteristic cognitive, affective, and physiological behaviors that indicate how learners perceive, interact with, and respond to the learning environment (Keefe, 1987).

At-risk Students: Pupils who have not earned the required number of high school credits for two successive years and will not graduate with their class.

Not-At-Risk Students: Successful pupils who have earned the required credits each year and will graduate after four years in high school.

Limitations of the Study

The study is not generalizable beyond the sample population for the following reasons: (a) the subjects in each group were not perfectly matched with regard for age

and gender, (b) the sample was only 150 students, (c) some students in the sample may have teachers who do accommodate different learning styles, (d) some students in the control group may have been at risk but not yet identified.

CHAPTER II

REVIEW OF LITERATURE

Dropping Out Of School

Poor academic achievement is the most common characteristic and, therefore, the best predictor of potential dropouts, according to the United States Department of Education statistics (Wittenberg, 1988). Gastright (1989) reported that course grades or academic achievement are better predictors of at-risk students than are standardized test scores. He discovered that one third of the dropouts scored above the national median on achievement tests but failed in school, and other students who were labeled at risk because of low achievement scores made average grades and graduated.

Some authorities (Cormany, 1987; Finn, 1987) believe that dropping out is the result of issues such as child abuse, drug and alcohol abuse, and family crises. They also believe that these issues are beyond school control and are not likely to be eradicated by school based remedies. Svec (1986) would even suggest that parents contribute to the dropout statistics by sometimes encouraging their student to drop out of school.

Opposite of this opinion is Lockwood's (1989) belief that conditions at school are important factors causing students to drop out of school. Students feel alienated from teachers and peers because they have difficulty doing the work and have a feeling of disregard for school work. One cause suggested for these feelings is the incongruences between the cultural expectation of schools and those of the student; (i.e., the student who wants to be an over-the-road truck driver finds himself/herself out of sync with the academic and vocational expectations of the school). Another school condition contributing to the feeling of alienation is the large student populations which are between 2,000 and 3,000 in many schools across the country. Lockwood claims that only about 10% to 20% of the students are recognized for their talents by the teachers and administration.

Former students themselves are divided in their reasons for dropping out. Some blame themselves; others blame their home life; and still others blame the school (Hahn, 1987). Although low self-esteem was not a specific reason given by dropouts for leaving school, most of the causes cited would seem to stem from a poor self-image. It is difficult to determine if the conditions at school create the students' feelings of low self-esteem or if the student brings such a poorly developed internal locus of

control to school that it causes him or her to perceive school in such a negative manner that he/she becomes a dropout. Some of the reasons given by former students for dropping out were not learning things they wanted to learn and the repetitive nature of the curriculum. Other causes given were unfair treatment by the teachers and administrative staff, detention and suspension, unkind peer pressure, and general feelings that school is a threatening place (Hahn, 1987; Presley & Seifert, 1988; Wittenberg, 1988). In one report, some students in Dallas, Texas, said that no one ever talked to them; no teacher, counselor, or administrator ever counseled with them about dropping out of school (Finn, 1987). Other reasons given for leaving school before graduation were pregnancy, being a welfare recipient, and being a member of single-parent households to whom work or military service was very attractive (Hahn, 1987).

As the phenomenon of dropouts is studied by educators, suggestions are proposed for the school's acceptance of its responsibility for prevention. Some ideas for addressing the problem are an increased number of counselors, a comprehensive health and family planning program, infant care facilities, and cooperative work/education projects. Other considerations for dropout prevention are remedial instruction, establishing connections between the school

and social service agencies, and providing alternative programs (Hahn, 1987; Wittenberg, 1988).

Examining the reasons for students' dropping out of school is important to the study of at-risk students and how schools can be as responsive to these students as they are to the successful students. Poor academic performance has been cited as the best predictor of a potential dropout. The reasons for poor academic performance are many, but one primary factor is how an individual learns.

Learning

Learning, according to Letteri (1988), is an activity of the mind that involves the applications of specific operations to new information, and making this information become a part of long-term memory. This is a cognitive definition of learning, and the student is central to the process and must understand how to control and direct it. Learning problems often develop when the student does not know how to exercise control over the learning processes and the operations of learning.

Learning has been described by McGhee (1987) as an inferential process within the brain based on prior knowledge. The brain accepts information and constructs its own interpretations of the information by drawing inferences based on former learning. McGhee agrees with Letteri that the process of learning is student centered.

The information processing strategy used by the student determines the effectiveness of the learning.

Keefe (1987), who agrees with the above two authorities, further states that all learning is entirely personal depending on readiness, incentive, learning style, rate of learning, and preferred methodology. He also believes that there are three interacting factors which influence the learning process. They are the student, the instructor, and the school environment, and if any of these factors are unsynchronized, the learning process will falter. Keefe also reports that learning is not just a cognitive process but a cognitive process combined with developmental, psychological, and environmental preferences. When the cognitive process is combined with the developmental, psychological, and environmental preferences of the learner, learning problems are diminished. The combining of the above factors is called Learning Style (Letteri, 1988), and according to Keefe, all factors of the learning style need to be synchronized for the student's learning process to function at its maximum capability.

Learning Style

The term "learning style" was first coined by Herb Thelen in 1954 (Ferrell, 1988). Learning style consists of distinctive behaviors which serve as indicators of how a

person learns from and adapts to the environment. It gives clues to how a person's mind operates (Gregorc, 1979).

Learning style is a consistent and pervasive set of characteristics and preferences that influence the way one sees and understands the world (Rummler, 1988). Rummler expands on this definition by stating that learning style affects perception, learning, and teaching. It also influences how one thinks, organizes thoughts, and listens to and understands what other people are saying.

There are a number of conceptual models of learning styles. Among the most widely used learning style models in the United States today is the Dunn model (Carbo & Hodges, 1988). Dunn and Dunn (1979) describe learning styles in terms of how an individual's ability to learn new and difficult material is affected by the following variables: (a) the immediate environment (noise level, temperature, amount of light, and furniture design); (b) emotionality (degree of motivation, persistence, responsibility, and need for structure); (c) sociological needs (learning alone or with peers, learning with adults present, learning in groups); (d) physical characteristics (auditory, visual, tactile, and kinesthetic strengths, best time of day for learning, need for food and drink while learning, and mobility requirements); and (e) psychological inclinations (global and analytic strengths).

Before formulating their learning style model, Dunn and Dunn (1979) conducted studies on how students learn. They discovered that some pupils require silence when concentrating while others will block out sound, and still other students require sound when learning and will turn on a radio or phonograph whenever attempting to absorb information. People respond differently to temperature. Some require a cool environment, but others are more productive when they feel comfortably warm. Learners respond differently to the amount of light available. Some think better in softly lit areas, but others become sleepy if illumination is not bright. Some people respond to excessive light with hyperactivity. The Dunns also learned that some students achieve better in an informal physical environment with carpeting, lounge chairs, and a couch, whereas others learn more easily in a formal setting of desks, library tables, and hard chairs. While studying the sociological elements of learning, Dunn and Dunn (1979) discovered that some students work and learn best when they are alone and do well with a contract activity package, but others achieve better when working with their peers in team learning and brain storming.

The Dunns then began developing an instrument to assess learning styles. After six years of testing and revising instruments, in 1974 they started using the

Learning Style Inventory (Dunn, Dunn, & Price, 1975) to identify students' learning preferences.

The Learning Style Profile (Keefe & Monk, 1986) assesses a learning style model developed by Keefe. This model closely resembles the Dunn model, but it has added an extra dimension, the cognitive element, which some (Gregorc, 1979; Keefe, 1987; Letteri, 1988) believe is fundamental to the understanding of learning style and must be included in the assessment.

According to Keefe (1987), learning styles are hypothetical constructs that help explain the learning and teaching process. They are the qualities in the behavior of individual learners that persist regardless of teaching methods used or the content of the material being learned. Learning styles cannot be directly observed, reports Keefe, in agreement with Gregorc (1979); they can only be inferred from a person's interaction with the environment.

The hypothetical constructs of learning style are based on three elements: cognitive, affective, and physiological. The cognitive element is the information processing habits which represent the learner's typical mode of perceiving, thinking, problem solving, and remembering (Keefe, 1987; McCurdy, 1989). McCurdy also emphasizes that perception is important to the cognitive element. He describes perception as one's innate

preference for kinesthetic or psychomotor, visual or spatial, and auditory or verbal modes of learning.

The affective component of learning style encompasses the aspects of one's personality dealing with attention, emotion, and valuing. These three are motivational processes, and affective learning style is the offshoot of these processes (Keefe, 1987). Persistence is part of the affective learning style. Persistence requires learners to face the prospect of failure as well as success and to continue the task to completion (Scott, 1988). Another aspect of the affective learning style is the internal locus of control. The internal person thinks of self as responsible for his/her own behavior, as deserving praise for successes and blame for failure. The external person sees circumstances beyond his/her control and believes luck or other people are responsible for his/her behavior (Keefe, 1987).

Physiological styles are biologically-based modes of response that are founded in gender differences, personal nutrition and health, one's physical environmental preferences such as a dim or light room, and preferred time of day for learning (Keefe, 1987; McCurdy, 1989).

Although there are several learning style models, they each share the premise that not all people learn the same way (Carbo & Hodges, 1988). Learning styles are highly

individualistic in direction and process. The direction learning takes is governed by one's felt needs and goals (Kolb, Rubin, & McIntyre, 1974). Three reasons given by Gregorc (1979) for the differences in learning styles are the genetic coding system, environment and culture, and the subjective part of individual natures. One's genetic coding system is the patterns of learning that have been passed down through the family. These patterns have permitted the survival of the family, nationality, and race. The environment and cultural influences are the expectations, preferred modes of behavior, mores, and laws of the culture. The third influence is the subjective part of individual natures, those aspects of the self or soul which are used for self-actualization.

Educators are being challenged to recognize that as society changes and costs increase, the key to effective schooling is to understand the range of students' learning styles (Keefe, 1987). Instruments have been devised for educators to analyze learning styles, but there has been criticism of them.

Gregorc (1979) in his analysis of learning style instruments points out some weaknesses. The instruments are exclusive and focus only on certain variables and sacrifice others. He suggests that some students wittingly or unwittingly lie on any type of self-reporting

instrument, and others read elements into questions that are not there, thus skewing the results. Another weakness of learning style assessments, Gregorc points out, is that some students have used artificial means of adapting to the environment for so long that they report these adaptations as preferred means of learning when really they are not, and the students are reinforcing their artificiality. Finally Gregorc believes that an educator's attitude toward a particular student or concept could influence instrument interpretation and also prescription by that educator for that student.

Keefe (1987) also is critical of many learning style instruments. Some of them only measure the cognitive elements of style such as the Edmonds Learning Style Identification Exercise (ELSIE), the Group Embedded Figures Test (GEFT), the Gregorc Style Delineator, and Cognitive Profile by Letteri. Others, such as the I/E Scale by Julian Rotter, which assesses the locus of control, and the Paragraph Completion Method (PCM), only address some of the affective style elements. The Learning Style Inventory (Dunn, Dunn, & Price 1975) assesses the affective style elements, and it also analyzes the physiological elements of learning style, but it does not measure the cognitive style elements. Educators and learning style authorities (Ferrell, 1988; Gregorc, 1979; Keefe, 1987; McCurdy, 1989)

believe that it is important to also assess the cognitive elements of learning style, and the Learning Style Inventory is deficient in this area. The Learning Style Profile (Keefe & Monk, 1986) was therefore developed. This instrument measures the cognitive, affective, and physiological elements of learning style.

Learning style experts (Carbo & Hodges, 1988; Dunn & Dunn, 1978; Ferrell, 1988; Gregorc, 1979; Keefe, 1987; McCurdy, 1989) agree that to understand learning and teaching styles and how the mind operates is very important for improved mental health and self-understanding and to increase learning. The main elements of learning styles are definable, and instruments have been devised to identify them. Strategies for teaching to students' styles and for improving their skills have been generated. Educators are being encouraged to recognize that with the rising costs of education, the key to effective schooling is to be aware of the wide range of students' learning styles. McCurdy (1989) suggests that teachers give students a learning style inventory and use the information gained from the assessment to assist students in their learning processes (McCurdy, 1989).

The purpose of this study was to compare the learning styles of at-risk students and successful students by using the Learning Style Profile (Keefe & Monk, 1986). It was

essential to review the literature on learning style to understand that there are cognitive, affective, and physiological elements of learning style. It was also important to review the literature concerning the instruments that have been developed to assess learning style. In actuality the literature revealed that there are only two instruments that inventory style. The Learning Style Inventory (Dunn, Dunn, & Price, 1975) has been in existence longer and was considered the best until recently. A review of the literature has revealed that the Learning Style Profile (Keefe & Monk, 1986) is more comprehensive for this study because in addition to assessing the affective and physiological elements of learning style, it also analyzes the cognitive element, which is not included in the Learning Style Inventory.

At-risk Learners

At-risk students are not unconcerned nor unmotivated; conversely they are anxious, depressed, and unable to cope with normal school stress. They have normal IQs but feel helpless and incompetent (Stevens & Phile, 1987).

In the 1960s educators were innovative and believed in the uniqueness of every human. They felt schools should be designed for students, not administrative convenience. The 1970s, however, began with an economic recession which created financial problems for school districts, and then

the decade saw declining test scores across the nation. Educators then decided there was a need to return to a solid foundation of reading, writing, and math. The belief in the uniqueness of the individual faded with the dreams and visions of the 1960s. The basics were emphasized through the 1970s and 1980s, but there was not much change in test scores, and the dropout rate remained at 25% (Keefe, 1987). Educators, Keefe asserts, overlooked the reality of individual differences in students. As the nation entered the 1990s, authorities once again advocated instruction that is responsive to individual differences and will help to improve learning conditions for students at risk of academic failure (Dunn & Dunn, 1987).

Understanding individual learning styles and teaching to them could perhaps lower the risk factor of failure for students. Pupils taught to their personal learning style strengths show higher test scores and improved attitudes toward school and learning which reduce the number of discipline problems (Dunn & Griggs, 1988; McCurdy, 1989). When students have an awareness and understanding of individual learning styles, they are better able to exercise control over their cognitive skills and do better academically. They are better adjusted, have a more positive attitude toward learning, and achieve at higher levels than their less skillful peers (Ferrell, 1988;

Scott, 1988).

Learning style advocates report that 90% of classroom instruction is geared toward the auditory learner which causes about 43% of the students to be at risk of failure (Dunn & Dunn, 1979; McCurdy, 1989; Stevenson & Burger, 1989; Willis, 1988).

Students learn in different ways and require different ways of teaching to learn (McCurdy, 1989). Successful students can learn in a visual, auditory, or tactile/kinesthetic mode because they are flexible and can adapt to different teaching modes. Learning style assessments indicate, however, that at-risk students have strong tactile/kinesthetic learning style abilities and are not so flexible to adapt to different teaching styles, and only about 30% to 40% of teaching is tactile/kinesthetic (Dunn & Dunn, 1979; McCurdy, 1989; Stevenson & Burger, 1989).

Researchers (Carbo & Hodges, 1988; McCurdy, 1989) doing studies on learning styles and at-risk students report that at-risk students need real life, experiential methods of learning. They are global learners. They understand broad concepts and need general overviews upon the introduction of the subject matter so that they know what they are trying to accomplish. Analytic learners, their opposites and usually successful students, do well

with the more typical teaching style that sequentially presents facts and details that lead to general conclusions. At-risk students prefer cooperative learning or working in groups with peers or one-on-one interaction with the teacher. They also have a greater need for mobility and intake of food and drink when they learn. They learn best in informal settings, reclining on easy chairs, lounges, carpeted floors with soft lights and headsets for listening to music. Dunn and Dunn (1987) also report that studies of at-risk students show that learning is more effective for them if it occurs in late morning, afternoon, or evening. They do not achieve well in early morning classes.

Authorities now recognize the learning styles of at-risk students and are strongly urging educators to obtain this knowledge about their students by giving them a learning style inventory and then using the results to make changes that will help students at risk of failing to become more successful in school.

This review of the literature revealed the learning style of at-risk students and how it sometimes differs from successful students. The literature is fundamental to this study of how at-risk students learn.

Learning Style in the Classroom

Two ideas are apparent from learning style research. Individual differences in learning style do exist, and when efforts are made to match the instructional environment with learning styles, the outcomes of learning are positively affected (Ferrell, 1988). It is also important that students have information about their own learning style strengths and use that information. An example of this was reported by Bauer (1987). In a resource room ninth grade learning disabled students, who were aware of their learning style strengths, began the day by sitting in groups which were determined by their learning style strengths and called "Circles of Strength." The students then wrote the study approach based on their learning style strength that would be best for them to use to do the assignment. Results showed that by doing this, they learned more than they had previously. They began to like school and do their work. In two semesters students felt better about themselves and each other. They studied harder and tried to succeed more, and they did show academic success.

Instead of focusing on students' disabilities and learning problems, instruction should be based on an understanding of learning styles and the use of an individual's strengths and preferences. By focusing on a

student's strengths, many of the learning barriers will be removed that became instilled after years of repeated failure (Willis, 1988). Dr. Helene Hodges removed those barriers for the many at-risk students she worked with during her 13 years in New York City public schools. She was working with truants, potential dropouts, handicapped students, and behaviorally disordered students. She set up a reading laboratory for at-risk students and used practical applications of their learning styles. Dr. Hodges conducted inservice programs for the teachers and administrators and helped the staff redesign curriculum to accommodate learning styles. She provided specific information about students' strengths and preferences while reading, and she suggested compatible teaching strategies, methods, and materials. The lab was multisensory in orientation. Within 10 months there was a 2.9 year growth in reading skills. It demonstrated that matching learning styles of students with appropriate instructional strategies improves their ability to concentrate and learn (Carbo & Hodges, 1988; Willis, 1988).

McGhee (1987) suggests that the day will come when learners will be identified by learning styles and matched to teachers who emphasize that style. Dunn and Dunn (1979), however, report that learning style characteristics and teaching style characteristics do not always cluster

into such neat groups for scheduling purposes in the schools, nor are teachers and students so consistent in their styles. If, however, teachers are given practical skills for teaching students through their individual learning styles, they will usually accommodate and can become effective with most students and simultaneously provide a humanistic, caring, nurturing atmosphere.

Teachers do not teach as they were taught, but rather they teach as they learn. Authorities (Barbe & Milone, 1989; Ferrell, 1988) recommend that teachers take the Learning Style Profile (Keefe & Monk, 1986) to become aware of their cognitive, affective, and physiological styles. This could show them their teaching style preferences, possible conflicts that could arise with students, and modifications that they might make in the classroom.

Some strategies are suggested by Carbo and Hodges (1988) and McCurdy (1989) for matching instruction with the learning styles of at-risk students. First an inventory must be given to identify students' learning styles and then the results must be shared with students so that they can feel valued, respected, and empowered. De-emphasize skill work requiring a strongly analytic learning style because most at-risk learners are globally oriented. Begin lessons globally with anecdotes and visual aids that will arouse their interest and give them a context in which to

place the lesson. Involve the tactile and kinesthetic modalities of the learner since most at-risk students are tactile/kinesthetic learners. Use resources that involve their hands in learning. Provide appropriate amounts of structure because many at-risk pupils thrive in structured and organized learning environments. Be cognizant of their sociological preferences and allow them to work with peers, one friend, the teacher, or alone as accommodates their needs. Establish quiet working sections at sufficient distance from noisier areas and create seating charts with consideration of windows to accommodate lighting preferences. Finally, if possible, experiment with scheduling by putting the most difficult subjects for the at-risk student later in the day.

Matching students' learning styles with compatible instructional strategies not only improves their ability to concentrate and learn, but research (Carbo & Hodges, 1988; Willis, 1988) also shows decreased stress and cases of physical illness. At-risk students feel physically ill and anxious when learning. When the brain must be involved in trying to cope with frustration, anxiety, and stress, learning is not taking place. The cerebrum "downshifts" during times of anxiety so that the student feels frozen. At these times the student is unable to think or talk and makes wild stabs at right answers (Carbo & Hodges, 1988).

Professional educators need to be familiar with factors affecting learning, and they need to design educational experiences to maximize learning styles that facilitate students' learning and minimize their stress (Armstrong, 1987).

The research of Hodges and Bauer reviewed in the literature is important and affirms the purpose of this study. There are differences in learning styles, and when they are accommodated in the classroom as was shown in this literature review, students are increasingly motivated, have a better self concept, feel better physically, and finally achieve academically.

Summary

Dropout prevention is an important consideration in schools today. In an attempt to discover the causes of the high rate of dropouts, one finds that there is little agreement among the researchers and even among the students themselves about the reasons for dropping out of school. Some researchers (Cormany, 1987; Finn, 1987) feel the problems are primarily at home; others (Hahn, 1987; Presley & Seifert, 1988; Wittenberg, 1988) believe the problems are also at school. Poor academic performance, however, has been cited as the best predictor of a potential dropout. The reasons for poor academic performance are many, but one primary factor is how an individual learns.

Learning is a cognitive process during which the brain assimilates new information by drawing inferences from prior knowledge. The learner is in control of this process, and when he/she does not understand how to manage the process, learning problems develop. When the cognitive process is combined with the developmental, psychological, and environmental preferences of the learner, learning problems are diminished. The combining of the above factors is called learning style (Letteri, 1988), and according to Keefe, all factors of the learning style need to be synchronized for the student's learning process to function at its maximum capability.

Learning styles are the characteristics and behaviors employed while interacting with the environment in an effort to assimilate new information with prior knowledge in the brain. Learning styles have cognitive, affective, and physiological elements, but they cannot be directly observed. They can only be inferred from a person's interaction with the environment. Although there are several learning style models, all share the premise that people learn differently. The main elements of learning styles are definable. Instruments have been devised to identify them, and strategies for teaching to students' styles and for improving their skills have been developed. Educators are being encouraged to recognize that with the

rising costs of education, the key to effective schooling is to be aware of the wide range of students' learning styles. Suggestions are that teachers give students a learning style inventory and use the information gained from the assessment to assist students in their learning processes (McCurdy, 1989).

Students do differ in their learning styles, and sometimes learning styles are incongruent with the teaching styles in the classroom. This research (McCurdy, 1989) has drawn attention to the at-risk student and has given some educators, specifically learning style advocates, some reasons for students being at risk of failing. When causes are known, then action can be taken to relieve the problem. Authorities (Carbo & Hodges, 1988; Dunn & Dunn, 1979; McCurdy, 1989) can now identify the learning styles of at-risk students and are strongly urging educators to obtain this knowledge about their own at-risk students by giving them a learning style inventory and then using the results to make changes that will help these students to become more successful in school.

Matching the learning environment with learning style preferences can have a positive effect on students, especially at-risk students. The research and work done by Dr. Helene Hodges in New York City and by Bauer in the resource classroom affirm this idea. When teachers

themselves take a learning style inventory, they become aware of their teaching style because teachers teach not as they were taught but as they learned. This awareness could help teachers make modifications in their classrooms for learning styles different from theirs. When students are taught by methods that compliment their learning style, they become increasingly motivated and achieve better. Focusing on the learning styles of at-risk students in the classroom could be one factor in the remedy for their low achievement.

CHAPTER III

METHODOLOGY

Subjects

The population for this study was high school students in a suburban school district near a metropolitan city in north Texas. There are about 6,000 predominantly Caucasian, middle class students in grades nine through twelve in this school district.

The experimental group was the entire student body of 86 at-risk students in the at-risk program. Of this group, 38 were male and 48 were female. The racial representation was one Asian, 10 Blacks, seven Hispanics, 66 Caucasians, and two others. The age distribution included 2 fifteen-year-olds, 14 sixteen-year-olds, 26 seventeen-year-olds, 33 eighteen-year-olds, eight nineteen-year-olds, and three twenty-year-olds.

The control group included 66 volunteer students in regular (i.e., not honors nor basic) English classes in grades 10 through 12. There were 26 males and 38 females, and the racial representation was four Asians, five Blacks, seven Hispanics, one Native American, and 47 Caucasians. The age distribution was 14 fifteen-year-olds, 24 sixteen-year-olds, 22 seventeen-year-olds, 2 eighteen-year-olds,

and 2 nineteen-year-olds.

Procedure

The schools used in this study were contacted through their principals. The principal of the at-risk program requested that the survey be administered to every student in the program because she desired to later use the results for future planning. Since she required all of the students to take the survey, parental permission was waived for this group. The entire student body, except for absentees, was tested in one day in groups of 12. Those who were absent were tested the following day.

An interview was set with the principals of the high schools in the district to explain the survey. Each principal gave verbal permission to use the students as subjects on a voluntary basis in the control group, but the students could not be taken out of their English classes to complete the actual survey.

Six teachers of regular English classes in the high schools were contacted, and a time was established to spend about ten minutes at the beginning of each class period to explain the survey and distribute to the students a one page letter for their parents explaining the proposed study and Consent Form A from the Human Subjects Review Committee. Students who volunteered to participate were asked to return the signed consent form to their

English teacher within a week. Eighty-two students returned a consent form signed by themselves and a parent.

The survey was conducted in the library of the schools over a period of two weeks. Students were notified by a corridor pass to come to the testing site. Sixteen of the volunteers did not participate in the survey. Three students had withdrawn from school before the survey could be conducted, and the reasons for the other volunteers not participating were unknown. Passes were sent to the students during different class periods on different days in an attempt to give students several opportunities to participate. The total sample size of the control group was 66 subjects.

The Learning Style Profile (Keefe & Monk, 1986) was administered to the students in small groups of five or six. Students were given as much time as needed to complete the survey, but most were able to do so within 45 minutes. The directions in the manual were read to each group of students in the control group and the experimental group, and questions related to the testing process but not to the specific content of any question were answered.

Instrumentation

The instrument used in this study was the Learning Style Profile (Keefe & Monk, 1986), designed to assess learning style elements which are classified in cognitive,

affective, and physiological/environmental domains. The instrument profiles 23 independent subscales which represent four higher order factors: cognitive skills, perceptual responses, instructional preferences, and study preferences. Cognitive skills were assessed by the subscales of Analytic Skill, Spatial Skill, Discrimination Skill, Categorization Skill, Sequential Processing Skill, and Memory Skill. Perceptual responses or initial reaction to information were reported by the subscales of Visual Perceptual Response, Auditory Perceptual Response, and Emotive Perceptual Response. Study/instructional preferences were indicated by the subscales of Persistence Orientation, Verbal Risk Orientation, Verbal-Spatial Preference for verbal versus nonverbal activities, and Manipulative Preference. Instructional environment preferences were profiled by the subscales of Grouping Preference, Posture Preference, Mobility Preference, Sound Preference, Lighting Preference, and Temperature Preference.

The Learning Style Profile (LSP) was normed on 5,000 students in more than 40 schools across the country. Reliability was evaluated in two ways. Internal consistency coefficients were calculated using Cronbach's alpha for each subscale, using the data from the entire normative sample. Second, test-retest reliabilities were

calculated for each subscale from a smaller separate sample for 10-day (n=243) and 30-day (n=241) periods of time. The average internal consistency reliability for the subscales is 0.61 with a range from 0.47 to 0.76. These reliabilities are acceptable for short tests, and the typical subscale is five items in length (Keefe & Monk, 1987). Support for face validity, construct validity, and concurrent validity has been reported (Keefe & Monk, 1987). Scale names were chosen for their ease of understanding, and scale items measure what they appear to measure thus assuring face validity. The LSP has construct validity because the subscales assess the elements of learning style, a "gestalt" of cognitive, affective, and environmental factors. Concurrent validity is present. LSP subscale scores were correlated with similar measures from the Group Embedded Figures Test, the Edmonds Learning Style Identification Exercise, and the Learning Style Inventory. The correlation of the Analytic Skill subscale of the Learning Style Profile with the Group Embedded Figures Test is 0.39. Correlations of the Learning Style Profile with the Edmonds Learning Style Identification Exercise and the Learning Style Inventory achieved a significance of .002.

Null Hypotheses

The following null hypotheses were tested:

1. There is no statistically significant difference in the cognitive skills of at-risk students and students not at risk of dropping out of high school.

2. There is no statistically significant difference in the perceptual responses to new information between at-risk students and students not at risk.

3. There is no statistically significant difference in study/instructional preferences of at-risk students and students not at risk.

4. There is no statistically significant difference in instructional environment preferences of at-risk students and students not at risk of dropping out of high school.

Statistical Analysis

Data were analyzed using a multivariate t-test on 21 scales using the BMPD program on an IBM PC90. Twenty-one scales were analyzed rather than 23 scales because the Discrimination and Sequential variables were highly skewed.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

Research indicates that successful students learn through several modalities, and their learning styles are more flexible and adaptable to various types of teaching methods. Students at risk of dropping out of school, however, have learning styles that are less flexible and contrary to styles required to succeed in traditional educational systems. The purpose of this study was to determine the differences between the learning styles of at-risk students and the learning styles of students not at risk of dropping out of school. Awareness of the differences in learning styles provides an indication to educators of some possible reasons for failure among at-risk students in traditional classrooms.

Information about the differences in learning styles can be beneficial to teachers and students. Learning style information provides at-risk students with an understanding that there is no judgment of right or wrong ways to learn. This is important for their self-esteem. This information can also be used by at-risk students to adjust their style so that they, like successful students, are more flexible and function better in the classroom. Successful students

can use this information to hone and strengthen their learning skills. An awareness of students' learning styles can give teachers more information about their students so that they can modify their teaching techniques to better accommodate the needs of all students in their classroom, especially those students at risk of failing.

One hundred and fifty high school students, 84 in the at-risk group and 66 in the not-at-risk group, were surveyed in this study. The Learning Style Profile was administered to each group of students. The answer sheets were scored by Data Scan, Incorporated, in West Trenton, New Jersey. An individual profile was received for each student. The profile included a score for each of the 23 subscales of the Learning Style Profile, a graphic representation indicating the placement of each subscale score, and a consistency score which indicated the consistency with which the student responded to the preference items of the instrument. Data were analyzed using a multivariate t-test using the BMPD program.

Results

The results of the statistical analysis for each null hypothesis regarding the differences in learning styles between students at risk of dropping out of school and those not at risk of dropping out of school are given below.

H1 There is no statistically significant difference in the cognitive skills of students at risk of dropping out of high school and students not at risk of dropping out of high school. This hypothesis was retained.

Table 1

Multivariate T-test for Cognitive Variables

Subscale	<u>N</u> 1=84	Mean AR	<u>N</u> 2=66	Mean NAR	<u>T</u>	Sig.
Analytic		49.6627		52.6349	-1.86	.0648
Spatial		51.0723		53.5397	-1.46	.1469
Categorize		57.6024		58.3333	-0.47	.6414
Memory		51.7831		51.9206	-0.07	.9429

N1= At-Risk Students

N2= Students Not At Risk

p-value = .05

Table 2

Standard Deviation of Cognitive Variables

Subscale	<u>N1</u> =84	Mean S.D. AR	<u>N2</u> =66	Mean S.D. NAR
Analytic		9.6743		9.4054
Spatial		10.5816		9.4882
Categorize		8.6602		10.2359
Memory		11.7100		11.1447

N1= At-Risk StudentsN2= Students Not At Risk

H2 There is no statistically significant difference in perceptual responses to new information between the at-risk students and those students not at risk. This hypothesis was retained.

Table 3

Multivariate T-test for Perceptual Response Variables

Subscale	<u>N</u> 1=84	Mean AR	<u>N</u> 2=66	Mean NAR	<u>T</u>	Sig.
Visual		52.3735		51.7778	0.33	.7440
Auditory		48.3374		46.8889	0.82	.4131
Emotive		48.3374		46.8889	-1.13	.2622

N1= At-Risk Students

N2= Students Not At Risk

p-value = .05

Table 4

Standard Deviation of Perceptual Response Variables

Subscale	<u>N1</u> =84	Mean S.D. AR	<u>N2</u> =66	Mean S.D. NAR
Visual		11.0495		10.6928
Auditory		10.1264		11.1081
Emotive		10.0384		11.5132

N1= At-Risk StudentsN2= Students Not At Risk

H3 There is no statistically significant difference in study/instructional preferences of at-risk students and students not at risk. Of the four subscales included in the categories of study/instructional preferences, there is a statistically significant difference in one subscale, manipulative, between the at-risk students and the students not at risk of dropping out of school. This hypothesis is retained.

Table 5

Multivariate T-test for Study/Instructional Preference Variables

Subscale	<u>N1</u> =84	Mean AR	<u>N2</u> =66	Mean NAR	<u>T</u>	Sig.
Persistence		45.3494		47.2857	-1.22	.2247
Verbal Risk		53.0723		52.4286	0.33	.7408
Verbal-Spatial		46.4217		46.9524	-0.50	.6179
Manipulative		47.8554		52.2381	-2.41	.0173

N1= At-Risk Students

N2= Students Not At Risk

p-value = .05

Table 6 .

Standard Deviation of Study/Instructional
Preference Variables

Subscale	<u>N</u> 1=84 Mean S.D. AR	<u>N</u> 2=66 Mean S.D. NAR
Persistence	9.7336	9.1905
Verbal Risk	10.9431	12.4625
Verbal-Spatial	7.2164	4.9885
Manipulative	11.0951	10.6267

N1= At-Risk Students

N2= Students Not At Risk

H4 There is no statistically significant difference in instructional environment preferences of at-risk students and students not at risk of dropping out of high school. Although there is a statistical difference in two variables, Evening and Group, between the at-risk students and students not at risk, this hypothesis is retained.

Table 7

Multivariate T-test for Instructional Environment
Preference Variables

Subscale	<u>N</u> 1=84	Mean AR	<u>N</u> 2=66	Mean NAR	<u>T</u>	Sig.
Early Morning		49.3856		50.6508	-0.68	.5002
Late Morning		52.6747		53.0794	-0.22	.8257
Afternoon		48.6747		50.3016	-1.02	.3115
Evening		44.9518		49.5714	-2.88	.0046
Group		39.1446		35.6508	2.56	.0114
Posture		51.7711		49.5714	1.18	.2409
Mobility		51.8675		53.7778	-1.15	.2500
Sound		46.3855		49.2222	-1.55	.1204
Lighting		51.5663		52.0159	-0.25	.8028
Temperature		51.7229		48.2381	1.84	.0685

N1= At-Risk Students N2= Students Not At Risk p-value = .05

Table 8

Standard Deviation for Instructional Environment
Preference Variables

Subscale	<u>N</u> 1=84	Mean S.D. AR	<u>N</u> 2=66	Mean S.D. NAR
Early Morning		10.2384		12.3630
Late Morning		11.1367		10.7693
Afternoon		9.2803		9.9752
Evening		9.2682		10.0446
Group		8.1945		8.1085
Posture		10.9526		11.4733
Mobility		9.5032		10.3992
Sound		10.5111		11.3158
Lighting		10.7853		10.7080
Temperature		11.4725		11.2159

N1= At-Risk Students

N2= Students Not At Risk

Summary

Analysis of the data from the study resulted in retention of all of the null hypotheses regarding the comparison of learning styles between students at risk of dropping out of high school and those not at risk of

dropping out. At the .05 level, there was no statistically significant difference between the two groups in a comparison of cognitive skills, perceptual responses to new information, study/instructional preferences, and instructional environment preferences.

CHAPTER V

SUMMARY AND CONCLUSIONS

No single cause can be agreed upon by researchers for a student to become at risk of dropping out of school. Some authorities (Cormany, 1987; Finn, 1987; Wittenberg, 1988) believe that the primary reasons for a student becoming at risk of dropping out of school are factors outside of school such as low socioeconomic status, single parent families, low parental education level, and disrupted home life. Others (Deblois, 1989; Presley & Seifert, 1988) see school-related problems such as being two years behind in reading and math skills, failing two or more courses by the eighth grade, possessing low self-esteem, non-participation in school activities, and a general feeling of alienation as the determiners of placing a student at risk of dropping out of school.

Learning style advocates (Carbo & Hodges, 1988; Dunn & Dunn, 1979; McCurdy, 1989; Vornberg & Ramsey, 1989) would suggest that one factor placing students at risk of dropping out is school-related, the mismatch between instructional method, classroom conditions, and the learning styles of students. This information seems to lead to the assumption that school personnel could be

influential in preventing a student from becoming at risk of dropping out of high school. If teachers were aware of students' individual learning styles, they could adjust their instructional methods to accommodate the learning styles of all students. They could better meet the needs of potential at-risk students and intervene before these students become dropout statistics. Counselors could be effective with potential at-risk students by advising them of their learning styles and by helping them to understand that there is no judgment of right or wrong styles, thus raising their self esteem. Counselors could help all students by using learning style information to guide students in designing their four year educational plans for high school. Students could capitalize on their strengths and develop strategies with help from teachers and counselors to strengthen their weak areas. This study was conducted to determine the differences in learning styles between students at risk of dropping out of high school and students not at risk or who have been successful throughout their school experience.

All of the 84 students enrolled in the at-risk program and 66 student volunteers in grades ten through 12 enrolled in regular English classes (i.e., not honors or basic) in a suburban school district in the southwest participated in the study. The Learning Style Profile (Keefe & Monk, 1986)

was administered to both groups of students. Data were analyzed by a multivariate T-test using the BMPD program.

The four null hypotheses of this study were retained. No statistically significant difference was found between at-risk students and students not at risk in the categories of cognitive skills and perceptual responses to new information; therefore, the null hypothesis that there would be no statistically significant difference in the cognitive skills of at-risk students and students not at risk was retained, and the null hypothesis related to perceptual responses to new information was also retained. A statistically significant difference was found in the manipulative subscale of study/instructional preferences, but there was no statistically significant difference in the other three subscales of that category, so the null hypothesis was retained. In the subscales of evening preference and group preference in the category of instruction environment preference, a statistically significant difference was found, but since there was no statistically significant difference in the other seven subscales of this category, the null hypothesis was retained.

Discussion

Current research indicates a growing interest in learning styles and the application of learning style

theory to the classroom. Factors contributing to this interest in the application of learning styles in the classroom are several. Learning styles fit into the personalized view of education which is appropriate to the diverse student population of the 1990's. Understanding learning style theories helps teachers better understand differences in their students and provide for these differences, thereby improving learning. Schools should be restructured to improve learning, and the central focus should be on learning styles which can be accommodated by expanding teaching methods and curricula to reach more students and address the dropout problem (Brandt, 1990; McCurdy, 1989; O'Neil, 1990). Learning style research indicates that individual differences in learning styles do exist, and when efforts are made to match the instructional environment to the individual's learning style, the outcome of learning is positively affected (Ferrell 1988).

Learning style advocates (McCurdy, 1989; Willis, 1988) direct their focus toward the at-risk student population suggesting that this group needs special attention given to their learning styles because they are often mismatched with teaching styles and are not flexible in adapting their learning styles to different teaching styles. The results of this cause them to be potential dropouts. Dunn and Dunn (1979) argue that when students are taught by the method

that complements their learning style, they become increasingly motivated and achieve better, thus preventing dropping out. Willis (1988) insists that underachievers are not handicapped as learners but usually are mismatched with the teaching style. Other authorities (Carbo & Hodges, 1988; Dunn & Griggs, 1988; McCurdy, 1989) reiterate that accommodating the learning styles of at-risk students results in increased academic achievement, higher test scores, improved attitudes toward school and learning, fewer incidences of discipline problems, and thus greater success in the educational system and fewer incidences of dropping out. Learning style advocates also contend that the learning styles of at-risk students are different from successful students. Successful students learn through more than one sensory modality (auditory, visual, or kinesthetic), are more flexible and adaptable to different teaching strategies, and are persistent in pursuing learning (Barbe & Milone, 1990; Kolb, Irwin, McIntyre, 1974; McCurdy, 1989).

Research (Dunn & Dunn, 1979; McCurdy, 1989; Stevenson & Burger, 1989) on sensory modalities of learning styles indicates that 90% of instruction in any classroom is lecture or lecture-discussion and, therefore, geared to the auditory learner, but only about 20 to 30% of all students are auditory learners. Successful students whose learning

styles do not show a preference for auditory learning, are flexible enough to adapt to that modality. At-risk students, approximately 90% of whom are kinesthetic learners, do not adapt well to the auditory teaching style. Stevenson and Burger (1989) relate that learning style tests show that 43% of dropouts have fair to poor auditory capabilities, and about 53% have fair to poor visual capabilities, the second most often used teaching strategy. The results of this study indicate that both at-risk and not-at-risk students prefer the visual mode of learning and least prefer the auditory mode, but the mean scores for both groups regarding their preference for auditory style of learning were in the neutral range, indicating that both groups of students are flexible and can adapt to that modality of teaching, contrary to past research. More not-at-risk students indicate a preference for the manipulative or kinesthetic style of learning. This was one of the three subscales that showed a statistical significant difference between the two groups ($p < .0173$), but the group showing the preference is contrary to the research cited. Persistence in pursuing learning was also measured in this research. The mean scores for both groups of students were in the average range, and there was no statistically significant difference between the two scores. This is contrary to past research which indicates

that at-risk students, unlike successful students, are not persistent in pursuing learning.

McCurdy (1989) states that most at-risk students are global learners as opposed to analytic learners. Global learners understand broad concepts and general overviews and prefer that teaching style upon introduction of new material. McCurdy further states, however, that most teaching methods are analytic. Facts and details are presented sequentially, and then conclusions are drawn. This present research indicates that the at-risk students are neutral about analytic teaching with a mean score of 49.6627 with neither a preference for or against analytic teaching. This score in the neutral range also indicates that the students are flexible enough to adapt to this style of teaching. This is contrary to past research cited. Their counterparts, the not-at-risk students, indicate a mean score of 52.6349 which is also within the neutral range and of no statistically significant difference from the at-risk students.

McCurdy (1989) also emphasizes that at-risk students prefer cooperative learning or working in small groups. This was the only subscale in which the students in this study were not in the neutral range. The mean score of the at-risk group is 39.1446, which shows a definite preference for small group instruction in accordance with McCurdy's

research. The not-at-risk group shows a mean score of 35.6508 indicating an even greater preference for small group instruction than that indicated by the at-risk group. There is a statistically significant difference between the two groups, but the group that past research cited to show the greater preference is the at-risk group, not the successful students.

Vornberg and Ramsey (1989) reported on research conducted with dropouts that indicates that they prefer evening for learning and have difficulty functioning in the morning. Carbo and Hodges (1988) and Dunn and Dunn (1987) state to the contrary that at-risk students are more alert during late morning or early afternoon. This study concurs with Carbo and Hodges and Dunn and Dunn. The mean score for the at-risk group was lower for evening study time preference than for any other time of the day. Their highest mean score for study/instructional time preference is late morning. The mean scores for the at-risk students on each of the study/instructional time preference subscales on the Learning Style Profile (Keefe & Monk, 1986) were within the neutral range indicating that these students would be flexible in adapting to instruction at any time of the day or evening. The at-risk students, however, are in a half-day program. Many of them can choose whether they wish to come to school in the morning

or afternoon. They may have become desensitized to how difficult it used to be for them to be in class during the time of day when they did not function well and thus were not so careful in answering these questions about time preference on the survey.

Dunn and Dunn (1979), Carbo and Hodges (1988), and Vornberg and Ramsey (1989) reported that at-risk students require mobility, need frequent breaks, are unable to sit still for long periods, and need to nibble and chew. This present study shows a mean score for the at-risk group of 51.8675 regarding a preference for mobility. This score falls in the neutral range indicating that these at-risk students can adapt to the mobility conditions of the environment. These students, however, again may not be as sensitive to this factor as would other at-risk students because not only do they attend class for just half a day, but they also have freedom of mobility in their program. They may leave a classroom and go to another class at any time; they may move about the classroom as they choose so long as they do not distract others; and there is a scheduled snack break each day when they can socialize and nibble and chew.

Carbo and Hodges (1988) also report that at-risk students learn best in an informal setting with soft lights and listening to music through headsets. The mean score

for posture reported by the at-risk group in this study was 51.7711, indicating that these students are neutral concerning formal or informal posture. Regarding light and sound, the at-risk students again had mean scores that fall in the neutral range, 51.5663 and 46.3855 respectively, indicating no preference. The not-at-risk students had mean scores of 52.0159 and 49.2222 respectively for the same subscales that show no statistical difference from the at-risk group.

Several learning style inventories are available for assessment of students and teachers. Supporters (Keefe, 1987; Letteri, 1988) of the Learning Style Profile (Keefe & Monk, 1986) believe that it more comprehensively analyzes learning skills and environmental preferences that affect a student's academic performance. They argue also that this instrument is particularly strong in assessing the cognitive elements of learning. Subscales analyzing cognitive abilities are analytic, spatial, categorizing, memory skills, and verbal-spatial preference, which is categorized under study/instructional preferences. The mean scores for all of these cognitive subscales for the at-risk group fell into the average range, indicating that most of these students are able to perform academically. These scores were expected because one of the criteria for students to be selected for this at-risk program is that

they were never qualified for special education classes. The mean scores for the not-at-risk group were higher in each of the cognitive subscales but not enough to indicate a significant statistical difference. This would also indicate that these at-risk students possess the necessary cognitive skills to be successful in a traditional education environment.

The Learning Style Profile (Keefe & Monk, 1986) is also unique in its emotive perceptual response and verbal risk orientation. The emotive perceptual response measures the learner's response to new information in terms of feeling. Emotive learners react initially to the physiological or emotional tone of an experience in contrast to visual or auditory learners. Again the mean score of the at-risk students was in the neutral range as was that of the not-at-risk students. Both groups had higher mean scores for the visual perceptual response to new information.

The verbal risk orientation subscale measures a student's willingness to speak out and to state opinions even if others disagree. Both groups have high average scores in this category. The at-risk program from which this group was chosen is designed to be a nonthreatening environment which encourages and safely permits the students to express their opinions.

Temperature is the final factor surveyed by the Learning Style Profile (Keefe & Monk, 1986). The mean scores of the two groups show no statistically significant difference, and their scores are in the neutral area, indicating that both groups of students will adapt to the temperature of the room.

Conclusions

The results of the data presented in this study indicate that there are no significant differences between the cognitive skills of at-risk students and students not at risk of dropping out of school. This would indicate that these at-risk students possess the necessary cognitive skills to be successful in a traditional classroom. It must be concluded that factors other than cognitive skills place the students in this study at risk of dropping out of school.

Based on the results of the data presented in regard to perceptual response to new information, the findings indicate that there are no significant differences between the at-risk group and the not-at-risk students. Both groups indicated more of a preference for visual learning, but both the at-risk students and those not at risk showed scores in the neutral range for the auditory and emotive perceptual responses. This would indicate flexibility in their preferences to responding to new information.

The results of the data presented regarding study/instruction preferences indicate that there is a statistically significant difference between the at-risk students and students not at risk in the preference of a manipulative approach to instruction. Data indicate that more not-at-risk students than at-risk students prefer the manipulative approach. Because there are no significant differences between the two groups in the other three variables, persistence, verbal risk, verbal-spatial, of study/instruction preferences, it must be concluded that there are no significant differences between the at-risk students and students not at risk in the area of study/instruction preferences.

Based on the results of data presented in regard to instructional environment preferences, the findings indicate that there are no significant differences between the at-risk students and the students not at risk. Both groups show a higher preference for studying in the late morning but indicate a flexibility for adaptation to studying and learning at other times of the day. Both groups indicate a definite preference for learning in small groups with no indication of flexibility for learning in large groups. Both groups do show flexibility in adapting to posture and mobility constraints, the amount of noise and light in the room, and the temperature of the room.

Implications

One implication of this study would seem to be agreement with the contention of Dunn and Dunn (1979), Carbo and Hodges (1988), and McCurdy (1989) which so strongly advocates that teaching students according to their learning style will give students at risk greater self-esteem and academic success. The at-risk program selected for this study provides for many of the differences in students' learning styles especially in the areas of study/instruction preferences and instruction environment preferences. It would seem that these students' learning style needs are being met, and therefore, they have greater self-esteem. These at-risk students, therefore, responded to the survey in a similar manner to the not-at-risk students who are having success in the traditional classroom.

Another implication of this study is that the at-risk students from this study are having their learning style needs met and have become desensitized to the conditions in the traditional classroom which made them at risk of dropping out of school. The desensitization perhaps could cause them to no longer be so aware of their preferences and unmet needs in the traditional classroom. This could cause them to respond to the survey as successful students without a significant difference from the not-at-risk

students. Gregorc (1979) reports that some students have used artificial means of adapting to the environment for so long that they report these adaptations as preferred means of learning when really they are not. This, too, could be a reason that there is very little difference between the learning style preferences reported by both groups of students in this study.

An implication also would be to review the contention of Finn (1987), Cormany (1987), and Wittenberg (1988) that there are other factors that place students at risk of dropping out of school. Since the scores of the two groups showed no significant differences on the Learning Style Profile (Keefe & Monk, 1986), there may be other conditions that place these students at risk of dropping out of school. Some of these conditions could be child abuse, alcohol and drug abuse, parents with low education level, low family socioeconomic level, and parents who are not advocates of education.

Recommendations

A knowledge of students' learning styles would seem to be important for all students and educators. When students are aware of their learning styles and understand that there is no judgment made that one characteristic of style is better than another, they can take active control over their learning and realize academic achievement, thus

raising their self-esteem (Keefe, 1987). When teachers are aware of their students' learning styles, they are more apt to adjust their teaching style and curriculum to meet the needs of the students, thus helping students to realize success and greater self-esteem (McCurdy, 1989).

Administering the Learning Style Profile (Keefe & Monk, 1986) to all students would be recommended to give educators information about individual students. Teachers could use the information gained about individual students' learning style to plan curriculum and adjust teaching methods. Counselors could use the profile results to counsel students in using their learning style to their advantage in the classroom and in their study habits.

Much of the research done in the past ten years has been short-term and has focused on a particular age group and a particular element of learning style (Brandt, 1990); therefore, further research is recommended, especially long-term research. Finding no statistical significance between the learning styles of at-risk students and students not at risk in this study yet finding so many other studies in the literature that did find significance between the learning styles of at-risk students and students not at risk would also indicate that further research be conducted.

The results of this study would indicate that the experimental at-risk group of students needs to be selected from traditional classes. These students would not be so desensitized to their conditions as are students in a program designed especially to meet the needs of at-risk students.

Tighter controls on the not-at-risk group would also be recommended to screen out students who might be designated at risk. The lack of ability to screen out at-risk students for this present study seemed to limit the findings and to result in no statistical significant differences between the two groups.

Summary

The present study examined the differences in learning styles between at-risk students and students not at risk of dropping out of school. The null hypotheses tested were:

1. There is no statistically significant difference in the cognitive skills of at-risk students and students not at risk of dropping out of school.

2. There is no statistically significant difference in perceptual responses to new information between at-risk students and students not at risk of dropping out of school.

3. There is no statistically significant difference in study/instruction preferences between at-risk students and

students not at risk of dropping out of school.

4. There is no statistically significant difference in instruction environment preferences between at-risk students and students not at risk of dropping out of school.

The null hypotheses regarding cognitive skills and perceptual responses to new information were retained. Although there is a statistically significant difference in one subscale of study/instruction preferences, the null hypothesis was retained. There were statistically significant differences in two subscales of instructional environment preferences, but the null hypothesis was retained.

Findings suggest that there are no differences in learning style between at-risk students and students not at risk of dropping out of school. Both groups indicate learning style preferences that contradict past research. At-risk students in past research show little flexibility to adapt to traditional teaching styles and classroom environments, but the at-risk students in this study had scores in the range of flexibility in all subscales but one, working in small groups. Not-at-risk students in this present study had higher scores for kinesthetic or manipulative learning style than did the at-risk students who in past research showed a preference for this sensory

modality of teaching.

Results of this study seem to indicate that an awareness of individual students' learning styles is important to raise student awareness of the different ways individuals learn and to also help students understand that there is no judgment of right or wrong styles. Students' self awareness and understanding could raise their self esteem and academic motivation and make them less at risk of dropping out of school. Teachers can also benefit from a knowledge of their students' individual learning styles so that they can adapt their teaching strategies and curriculum to better meet the needs of their students, especially the at-risk students. Counselors need an awareness of students' individual learning styles to help them plan their educational programs to take advantage of their learning style strengths.

Because the results of this study seem to contradict the results of several studies in the literature, the need for further research in this area is indicated to determine if there are significant differences in learning styles between students at risk of dropping out of school and students not at risk of dropping out of school. Research is also needed to determine differences other than learning style between these two groups that would cause some students to be at risk of dropping out of school.

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