The relationship of match or mismatch of student and teacher learning style preference and the formation of teacher expectations of student achievement
by Cynthia Jane Jacobsen

A thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Education
Montana State University
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Abstract:
During the first semester of the 1987-88 school year, the researcher conducted a research study of seventh through twelvth grade students in the Naknek School and the Newhalen School located on the Alaska Peninsula. The problem of this study was to determine if there was a relationship between the match or mismatch of learning style preference of students and teachers, actual student achievement, and teacher expectations of student achievement. The attribute variables of student gender, student age, student attitude toward school, student ethnicity, and the student's family structure were examined to determine the contribution each made toward the formation of teacher expectations of student achievement.

Ten teachers from the two schools identified 160 students who were enrolled in their classrooms for the first time. Each student was rated on a 5-point scale by the teachers as to expected levels of achievement. Each student's and teacher’s learning style preference was identified by Kolb's Learning Style Inventory. Preferences were compared to determine a match or mismatch in learning style preference. Each student provided their own demographic information. The Quality of School Life Scale was used to determine students' attitude toward school. Actual student achievement was obtained from first semester grades.

Multiple regression showed that actual student achievement and student ethnicity contributed to the formation of teacher expectations of student achievement. The match or mismatch of student and teacher learning style preference, student gender, student age, student attitude toward school, and the student's family structure did not contribute significantly. Teachers had higher expectations for Caucasian students than for Alaskan Native students. There was a relationship between student gender and match or mismatch of student and teacher learning style; student ethnicity and actual student achievement; and student's family structure and student gender, student age, and student ethnicity.

Based on this analysis, the researcher concluded that teachers hold higher expectations of achievement for Caucasians than for Alaskan Natives.

THE RELATIONSHIP OF MATCH OR MISMATCH OF STUDENT AND TEACHER LEARNING STYLE PREFERENCE AND THE FORMATION OF TEACHER EXPECTATIONS OF STUDENT ACHIEVEMENT

by

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A thesis submitted in partial fulfillment
of the requirements for the degree

of

Doctor of Education

Montana State University
Bozeman, Montana

May 1988

D378
I545

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ACKNOWLEDGEMENTS

I would like to express my gratitude to the many people who have helped me in the completion of this degree. A special thank you goes to Dr. Leroy Casagranda, chairman of my graduate committee, for his knowledge, expertise, and helpfulness during this study. Appreciation is also expressed to Dr. Gloria Gregg and Dr. Douglas Herbster as members of the reading committee for their much needed assistance. Dr. Eric Strohmeyer and Dr. Duane Melling as the other members of the committee contributed both of their time and expertise, which was greatly appreciated.

The Bristol Bay Borough School District and The Lake and Peninsula School District assisted greatly with this study by allowing me access to their schools. In particular, I would like to thank the teachers who participated in this study.

Finally, I wish to thank my husband, Gary, and two sons, Leif and Lars, for their support and understanding in seeing me through this endeavor.

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ABSTRACT

During the first semester of the 1987-88 school year, the researcher conducted a research study of seventh through twelvth grade students in the Naknek School and the Newhalen School located on the Alaska Peninsula. The problem of this study was to determine if there was a relationship between the match or mismatch of learning style preference of students and teachers, actual student achievement, and teacher expectations of student achievement. The attribute variables of student gender, student age, student attitude toward school, student ethnicity, and the student's family structure were examined to determine the contribution each made toward the formation of teacher expectations of student achievement.

Ten teachers from the two schools identified 160 students who were enrolled in their classrooms for the first time. Each student was rated on a 5-point scale by the teachers as to expected levels of achievement. Each student's and teacher's learning style preference was identified by Kolb's Learning Style Inventory. Preferences were compared to determine a match or mismatch in learning style preference. Each student provided their own demographic information. The Quality of School Life Scale was used to determine students' attitude toward school. Actual student achievement was obtained from first semester grades.

Multiple regression showed that actual student achievement and student ethnicity contributed to the formation of teacher expectations of student achievement. The match or mismatch of student and teacher learning style preference, student gender, student age, student attitude toward school, and the student's family structure did not contribute significantly. Teachers had higher expectations for Caucasian students than for Alaskan Native students. There was a relationship between student gender and match or mismatch of student and teacher learning style; student ethnicity and actual student achievement; and student's family structure and student gender, student age, and student ethnicity.

Based on this analysis, the researcher concluded that teachers hold higher expectations of achievement for Caucasians than for Alaskan Natives.

CHAPTER 1

INTRODUCTION

The area of teacher expectations of student achievement was brought to the forefront of educational research with Rosenthal and Jacobson's publication entitled, Pygmalion in the Classroom. This publication was a report of their study into the area of teacher expectations of student achievement conducted in 1968 at the Oak School in San Fransisco. Critics of Rosenthal and Jacobson's study have produced a great deal of evidence concerning the poor quality of the design and format of the research itself (Brophy, 1983). Supporters of this piece of research have looked beyond the problems with design and have felt that as soon as teachers were trained in communicating high expectations to students, all students would be able to achieve at higher levels. Whether the procedures were designed correctly or the findings were an accurate representation of the situation are no longer important. The fact remains that the study brought this issue to the awareness of educators and the public. The result has been that investigators have become interested in the general area of research concerning

teacher/learner interaction in the classroom, and more specifically, the area of teacher expectations of student achievement. Teacher expectations have continued to be a significant area of educational research as a part of the effective schools' research of the 80's.

The area of teacher expectations has been one of the major themes presented in the effective schools' research (Brookover, et al., 1982). People in the field of education must be aware of the effects they are creating when they categorize students' expected level of achievement. This can be done in many ways and, generally, is done without the individual teacher making a conscious effort to communicate those expectations to the student or to other teachers. Comments made in the teachers' room regarding the ability, the behavior, the attitude, or the home life of particular students can produce feelings as to what other teachers expect from those students (Brookover, 1982). The Coleman Report (1964) suggested that schools, and educators as a whole, could not make any real difference in the achievement levels of low socioeconomic and minority students. The report stated that the major controlling force in the development of these children resulted from the home environment. However, Brookover and others (1982:32) have stated that "our experiences and research indicate strongly that teachers' expectations of students' academic achievement are a major factor in what happens within a school." If an educational

system is to provide quality education to all of the students, there must be an acceptance of the idea that all students can achieve at high levels (Brookover, 1982).

Investigation into the broad area of learning styles is another example of attempts by education to better meet the needs of individual students. The original quest for more detailed and reliable knowledge concerning learning styles can be traced to teachers' observations of students during the learning process (Gregorc, 1984). Gregorc observed that many students achieved at high levels, and that different students used different methods to acquire the necessary knowledge. His observations showed that some students would utilize cramming, while other students would write detailed notes. Similar observations by teachers created the interest and need for more in-depth information gained through research as to why individual students in a classroom would use different methods to learn.

There is a wide range of categories and definitions within the broad area of learning styles. However, there still seems to be some question concerning the idea that different students learn better when different methods are used to present the information (Hyman and Rosoff, 1984). Hyman and Rosoff (1984) have observed that many researchers have investigated learning styles and there does not appear to be any one best definition or

instrument that will measure an individual's learning style in all situations and for all purposes.

Research continues to investigate how individual students process and internalize information. Friedman and Alley stated "cognitive style awareness embraces the concept that both students and instructors are accountable for learning" (1984:80). However, for the purposes of this project it was considered important to attempt to determine how the existing learning style information could be applied to the learning/teaching process. The question addressed in this project was not an investigation of what are learning styles, but rather how are learning styles effecting the learning/instructional process in a particular situation?

> The school learning process is a consequence of learning environment, teaching style, and student learning style. Learning style emerges from this picture as a key element in the movement to make learning and instruction more responsive to the needs of individual students (Keefe, 1979:16).

The issue of how learning styles effect the learning instructional process was approached in this research project by considering the learning style preferences of the individuals, both teachers and students, involved in the teaching/learning process.

Statement of the Problem

The problem of this research project was to determine if there was a relationship between the match or mismatch of learning style preference of students and teachers, actual student achievement, and teacher expectations of student achievement. The attribute variables of student gender, student age, student attitude toward school, student ethnicity, and the student's family structure were examined to determine the contribution each made toward the formation of teacher expectations of student achievement.

Need for the Study

Bargar and Hoover (1984) stated that during the learning process there is a four-way interaction between the learning style of the student, the learning style of the teacher, the instructional method utilized, and the demands of the subject area. As with any interaction, one component cannot be separated from the others without having an effect on the entire process. If the teacher alters the method of instruction within the demands of the subject area, the effects on the learning process must be examined and evaluated as to the overall impact the change could have on student achievement. Determining methods of instructional delivery may simply be a reflection of the teachers' learning style preference. For example, when the

teacher prefers to utilize the method of forming small groups to work on projects in science, it must be determined what the effect could be on students who prefer to work individually, and how effectively the information can be communicated through the chosen procedure. The question needs to be asked, if the objective of the lesson was for the student to understand the relationship of new information to something already known, and the primary method of instruction does not provide for this, would this reflect the student's interest and/or ability as much as it would reflect a difference between the student's learning style preference and the teacher's chosen teaching style?

> It would be useful, therefore, to know whether a given (teacher's) style leads a teacher to select a particular type of classroom activity to emphasize particular kinds of academic work or to treat students in particular ways (Doyle and Rutherford, 1984:24).

The implications for education are that when the teacher and student are of opposite learning style types, they are operating, unconsciously, in different manners (Bargar and Hoover, 1984). Bargar and Hoover (1984) further stated that teachers project information and behaviors utilizing instructional methods with which they feel most comfortable, and a student, who does not feel comfortable with the chosen instructional methods, can become confused, can feel rebellious, or can give in to the teacher's way of looking at information and

try to deal with the discomfort he/she is feeling. Bell (1986:18) also stated that, "Stress, frustrations and burn-out can result." Bargar and Hoover (1984:19) concluded that when the student does not show high achievement, the teacher may decide the student, "just isn't trying, doesn't care, or lacks ability" without considering the possible involvement of methods that different individual students employ to process and internalize information.

It is critical that the underlying causes for student frustrations be examined so methods can be implemented that will reduce those frustrations, thus allowing students to direct their energies toward more efficient learning. A thorough understanding of learning styles could help the teacher determine how best to help students work within their own styles, as well as learn to feel more comfortable when information is presented in a manner that is not their first preference (Gregorc, 1984).

> Perhaps teachers set a "tone" in their classrooms which favor certain styles, systems of thought, and mind qualities. Those learners who comply with the teacher's preferred style may receive favoritism while their counterparts are reprimanded for their individualities. Learners who refuse to accommodate to the preferred style may sometimes be labeled learning disabled (Gregorc, 1984:54).

Dusek and Joseph (1983) reported in their meta-analysis of research dealing with teacher expectations that research has

shown several non-academic pieces of information which have an effect on the formation of teacher expectations. They found that such things as student ethnicity, student gender, students' attitude toward school, and students' family structure played a part in the formation of those expectations. From Dusek and Joseph's research there appeared to be general agreement that teacher expectations of student achievement, formed as a result of those characteristics, are made unconsciously by the teacher. Although a majority of researchers support the idea that intelligence is independent of style (Guild and Garger, 1985), the question remains that when a difference exists between the characteristics and behaviors of teachers and students, how will the students' resulting frustrations effect the teachers' expectations for successful achievement?

When teachers' ratings of student achievement were based on classroom attentiveness, self-confidence, and the ability to work independently, there appeared to be higher and more enduring correlations with actual student achievement levels than when the ratings were based on fictitious students' names, records, or physical characteristics (Dusek and Joseph, 1983). The characteristics of work independence, self-confidence, and ability to concentrate on classroom presentations are frequently the same components that are present in discussions of learning styles. The degree that teachers perceive the relative strength and/or weakness of these characteristics in students can be

related to the teachers learning style preference as well as the learning style preference of students. Dusek and Joseph (1983) indicated that future research should be directed at examining the importance of the differential effects that student learning characteristics have for teacher expectancies.

General Questions to be Answered

The research process answered the following questions:

1. Were there multiple correlation between the dependent variable (teacher expectations of student achievement) and the independent variables of match or mismatch of teacher and student learning style preference, student gender, student age, student ethnicity, student attitude toward school, the student's family structure, and actual student achievement as measured by end of semester grades?
2. Did one or more of the independent variables make a unique contribute to teacher expectations of student achievement when the other independent variables were taken into account.
3. Was there any intercorrelation among the independent variables of match or mismatch of teacher and student learning style preference, student gender, student age, student ethnicity, student attitude toward school,

student's family structure, and actual student achievement as measured by end of semester grades?

4. Was there interaction between student learning style preference, based on the "Learning Style Inventory" developed by David Kolb and student ethnicity on teacher expectations of student achievement?
5. Was there a statistically significant difference between the mean scores of teacher expectations of student achievement of Caucasians and Alaska Natives?
6. Was there a statistically significant difference in the mean scores of teacher expectations of student achievement among the student learning style preferences of Diverger, Converger, Accommodator and Assimilator, based on the "Learning Style Inventory" developed by David Kolb?
7. Was there interaction between student learning style preference, based on the "Learning Style Inventory" developed by David Kolb, and student gender on teacher expectations of student achievement?
8. Was there a statistically significant difference in the mean scores of teacher expectations of student achievement between males and females?
9. Was there interaction between student learning style preference, based on the "Learning Style Inventory"

developed by David Kolb, and student attitude toward school on teacher expectations of student achievement?

10. Was there a statistically significant difference in the mean scores of teacher expectations of student achievement among the three student attitudes of high, medium, or low toward school?
11. Was there interaction between student learning style preference, based on the "Learning Style Inventory" developed by David Kolb, and student age on teacher expectations of student achievement?
12. Was there a statistically significant difference in the mean scores of teacher expectations of student achievement among the student age groups of 12-14, 15-16, or 17-18?
13. Was there interaction between student learning style preference, based on the "Learning Style Inventory" developed by David Kolb, and the student's family structure on teacher expectations of student achievement?
14. Was there a statistically significant difference in the mean scores of teacher expectations of student achievement among the student's family structure of both parents, one parent, or guardian other than a parent?

General Procedures

The population of this study consisted of seventh through twelfth grade students enrolled in school at the Naknek School in the Bristol Bay Borough School District located in Naknek, Alaska, and at the Newhalen School located in Newhalen, Alaska, in The Lake and Peninsula School District during the first semester of the 1987-88 school year. Criteria for student participation in this study was that the student had not previously been enrolled in a class taught by the participating teacher.

The study began during the second week of the fall semester of the 1987-88 school year. This allowed time for the organizational structure of the classroom to be established by the teacher and allowed the teacher time to become personally and academically acquainted with the students new to each teacher. However, the data were gathered prior to the first summative examination administered to students by each teacher.

For the purposes of this study, learning style preference for both teachers and students was determined by the "Learning Style Inventory" (LSI) developed by David A. Kolb (1985). The four learning style types identified by the LSI are the Converger type, the Diverger type, the Assimilator type, and the Accommodator type. Student attitude toward school was

assessed through the use of The Quality of School Life Scale (QSL) developed by Joyce L. Epstein and James M. McPartland (1978). This instrument is divided into three subsections that examine students' feelings toward school, students reaction to classwork, and students reaction to teachers. The subsection scores are combined into one raw score that is used to determine high or positive attitude, medium or average attitude, and low or negative attitude toward school.

Information regarding the attribute variables of student age, student gender, student ethnicity, and the student's family structure were gathered from students using a demographic sheet developed by the researcher (Appendix A). As a final step in gathering data during the initial stages of the research, each teacher was asked to identify each learner's expected level of achievement on a five-point scale with five (5) being high and one (1) being low. This information was gathered from information sheets developed by the researcher (Appendix B). At the completion of the first semester, each teacher's actual achievement level for each student was gathered from student report cards for the first semester.

The data were analyzed using multiple regression to determine if there was a relationship between match or mismatch of teacher and student learning style preference, actual student achievement, student age, student gender, student ethnicity, student attitude toward school, and the student's

family structure and teacher expectations of student achievement. The attribute variables were also analyzed using two-way ANOVA's to determine if there was interaction between each of those variables and teacher expectations of student achievement.

Limitations

The scope of this study was limited by the following items:

1. The population was limited to students in grades seven through twelve enrolled in regular classrooms with teachers for the first time.
2. The population was limited to students enrolled in the Naknek School of the Bristol Bay Borough School District and the Newhalen School of The Lake and Peninsula School District.
3. For those students enrolled in the Naknek School, the instructional content was limited to those goals and objectives established by the Bristol Bay Borough School District.
4. For those students enrolled in the Newhalen School, the instructional content was limited to those goals and objectives established by The Lake and Peninsula School District.

Delimitations

This study was restricted by the following delimitations:

1. Measurement of learning style preferences for students and teachers was made using Kolb's "Learning Style Inventory".
2. The timeframe of the study was the first semester of the 1987-88 school year at the Naknek School of the Bristol Bay Borough School District and at the Newhalen School of The Lake and Peninsula School District.

Definition of Terms

The following definitions were used during the course of this study:

1. Achievement - as measured by the end of the first semester grades of A, B, C, D, or F of students based on district curriculum guides and objectives of the Bristol Bay Borough School District and The Lake and Peninsula School District, respectively.

2. Frustrations - situations that prevent the student from using his/her best qualities -- behavioral signals that learning is being thwarted by style-controlled conditions (Butler, 1984:148).

3. Learning Style - a consistent pattern of behavior but with a certain range of individual variability (Cornett, 1983:9).

A. Accommodator Learning Style Preference - have the ability to learn primarily from "hands-on" experience. People with this style enjoy carrying out plans and involving themselves in new and challenging experiences and have a tendency to act on "gut" feelings rather than on logical analysis. These people may rely more heavily on people for information than on their own technical analysis (Kolb, 1985: 7).

B. Assimilator Learning Style Preference - are best at understanding a wide range of information and putting it into concise, logical form. People with this style are less focused on people and more interested in abstract ideas and concepts and find it more important that a theory have logical soundness than practical value (Kolb, 1985: 7).

C. Converger Learning Style Preference - are best at finding practical uses for ideas and theories. People with this style have the ability to solve problems and make decisions based on finding solutions to questions or problems and would rather deal with technical tasks and problems than with social and interpersonal issues (Kolb, 1985: 7).

D. Diverger Learning Style Preference - are best at viewing concrete situations from many different points of view. People with this style would rather observe than

take action and may enjoy situations that call for generating a wide range of ideas, as in a brainstorming session. These people have broad cultural interests and like to gather information (Kolb, 1985:7).

4. Matched Learning Styles - when the teacher and the student both have the same learning style preference as identified by Kolb's "Learning Style Inventory".

5. Mismatched Learning Styles - when the teacher has a learning style preference that is different from the student's learning style preference as identified by Kolb's "Learning Style Inventory".

6. Teacher Expectations - the level of achievement that the teacher anticipates from each particular student.

The next step in this research project was a review of the literature and research related to teacher expectations of student achievement and learning styles. This is found in Chapter 2.

CHAPTER 2

REVIEW OF LITERATURE

Introduction

There are many different views as to exactly what learning styles are and what, if any value, the identification of students' learning styles can have for education. Although there does seem to be general agreement as to the value of knowing more about a student's learning style, there appears to be many different definitions and criteria for evaluating the learning style of students. Definitions for learning styles range from preferred sensory modalities to personality characteristics that suggest behavior patterns (Smith and Renzulli, 1984). Once a student's learning style has been identified, there exists a wide range of opinions concerning how this information effects the student in reaching his/her educational goals and objectives. Keefe (1979:16) stated: "Learning style emerges from this picture as a key element in the movement to make learning and instruction more responsive to the needs of individual students."

Teacher expectations have been found to have an effect on the level of student achievement (Brookover et al., 1982). Expectations have been defined by Keefe (1979:11) as follows: "Expectancy is the subjective certainty that a particular outcome will follow a particular act, that something will or will not occur."

Although the Pygmalion research conducted by Rosenthal and Jacobson has been critically analyzed as to weaknesses within the design, it did bring the subject of teacher expectations and possible effects and ramifications that teacher expectations might have on student achievement to the attention of educators.

> Early studies of expectations effects (i.e., Rosenthal & Jacobson, 1968) generated considerable controversy. This was due mainly to differences in educators' beliefs concerning the inferential power of isolated studies and to methodological problems associated with *in vivo* educational research. (Cooper, 1979:389)

Concerns regarding the early teacher expectations research have been overcome in the research of the 70's (Brophy, 1986). Since that time the research has been able to concentrate on the investigation of factors that could contribute to the formation of teacher expectations. Bargar and Hoover (1984) suggested learning styles could affect how teachers formulate their

expectations for students to achieve as well as what level of achievement teachers expect from different students.

The following review of literature concentrated on the subject areas of definitions of learning styles, matching teaching styles and learning styles, effective schools and teacher expectations, teacher expectations, communication of teacher expectations, factors that contribute to teacher expectations, and effective communication of expectations.

Definitions of Learning Styles

The basis of learning style identification and research can be traced to Jung's four psychological types (Bargar and Hoover, 1984). These psychological types have been used as the basis for explaining how different people perceive and judge the information they encounter (Kolb, 1984). An individual's psychological type is a reflection of what and how that individual thinks about things. Kolb further stated that learning style theory builds on the psychological types and relates them directly to the learning process. Just as one psychological type is not superior to the other three types, no one learning style has an advantage over the other learning styles. Kolb (1984:77) stated, "Each of us in a unique way develops a learning style that has some weak and some strong points."

There is a background of commonality within the style differences. Kolb (1984) established two distinct dimensions,

one deals with understanding experiences in the world, and the other deals with transforming that experience. He represented these dimensions with the following titles: Concrete Experience (CE)-Abstract Conceptualization (AC) and Active Experimentation (AE)-Reflective Observation (RO), respectively. Each of these functions has a dichotomy of descriptors which are polar to the other descriptors forming two continua. The differences are found within the commonality of attitude, perception, and judgement.

Hyman and Rosoff (1984) in their article, "Matching Learning and Teaching Styles: The Jug and What's In It," made an analysis and comparison of the various learning style definitions and related those definitions to the act of teaching. They made the following recommendations. 1. Teaching consists of student, teacher, and subject matter, in the context of environment and time. 2. Learning styles are not static. 3. Teachers should use a multi-dimensional perspective, looking at actions not ability. 4. Teachers should look beyond just cognitive areas. 5. Teachers should recognize they can control only their own actions. 6. Teachers need to be students of teaching - staying current. 7. Teachers should avoid a unilateral approach.

Rita Dunn (1984:12) defined learning style as: "Learning Style is the way in which each person absorbs and retains information and/or skills; regardless of how that process is described, it is dramatically different for each person."

However, Hyman and Rosoff (1984) stated that the Dunn definition of learning styles doesn't account for any interaction of the various elements, the differences of intelligence, or the processing of information. David E. Hunt (1979:27) stated that: "Learning style describes a student in terms of those educational conditions under which he is most likely to learn. Learning style describes how he learns, not what he has learned." Hunt's definition dealt with three conceptual levels identified as stages A, B, and C. Stage A describes a student as concrete, impulsive, and having a poor tolerance for frustration. Stage B describes a student as being concerned with rules, a categorical thinker, and dependent on authority. State C describes a student as inquiring, questioning, and self-assertive. This definition doesn't tell how students process information, although it does describe how much structure students need in their learning environment.

The area of learning styles is much more involved than just environmental considerations. Both Gregorc's and Keefe's definitions of learning styles are given in behavioral terms. Keefe (1984:4) stated: "Learning styles are characteristic cognitive, affective, and physiological behaviors that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment." Cornett (1983) further expanded the understanding of these behaviors by stating that the cognitive style refers to the way information is processed and is associated with hemisphericity; the affective

style deals with emotional and personality characteristics; and finally, physiological style pertains to environmental and perceptual elements. Keefe's definition did discuss all three style domains, but didn't provide any specific behaviors within each of those style domains.

Gregorc (1979:19) defined learning style as: "The consistence of distinctive and observable behaviors that provide clues about the mediation abilities of individuals." Gregorc's definition was in reference to cognitive style, while Keefe's included all three areas, cognitive, affective, and physiological style domains. Gregorc's definition only addressed one area and ignored the others.

The definition that has considered many of these various components is stated by Claudia Cornett (1983:9): "Learning style can be defined as a consistent pattern of behavior but with a certain range of individual variability." However, she further recommended that "Rather than simply looking at learning styles in isolation, educators need to understand styles as they are manifested in the classroom, interacting and influencing one another in an infinite number of ways."

Matching Teaching Styles and Learning Styles

There appears to be two categories within the general topic area of matching teaching and learning styles. One category addresses the matching of students and teachers by

personality characteristics or learning behavior, while the other category deals with matching the teaching strategies to be utilized with the student's learning style preference (Smith and Renzulli, 1984).

Within the category of matching students and teachers by learning style preference some type of assessment instrument would be used to identify both the student's learning style preference and the teacher's learning style preference. Students and teachers with similar learning behaviors and approaches to the learning process are matched with each other in the same learning environment. Smith and Renzulli (1984) believe that matching learning characteristics and behaviors of the teacher with those of the student can improve the classroom climate. There is an ease of learning when the environmental demands and expectations for the students are similar to their own system of thought. It is also true that when the environmental demands are outside of the student's range of tolerance, the student finds the learning challenging, hard, and even distasteful (Gregorc, 1984).

Joyce (1984) defined marginality as when the learner has difficulty relating to the educational environment which can result in frustration on the part of the learner, and feelings that he/she can not learn in that particular environment or even that he/she can't learn anything. He continued that marginal learners are "twice" punished, once through frustration and once through stigmatization. Not only does the learner feel inadequate within

him/herself, but at the same time the learner must deal with pressure from peers and teachers as to the learner's capabilities for learning. The areas people feel the most uncomfortable with and will try to avoid using can create prejudicial feelings from those individuals who are able to operate successfully within that circumstance. These feelings can effect the interpersonal relationships between students and teachers, between fellow students, and between fellow teachers (Bargar and Hoover, 1984).

When teacher and student are of opposite types, they are operating, unconsciously, in different manners (Gregorc, 1984). Teachers project the information in a manner that is most comfortable for them. Learners must try to adjust their information processing capabilities to match those of the teacher. When there is a mismatch of learning style preference between the teacher and student, the student can feel rebellious, can become confused, or can give in to the environment. When the latter happens the learner must attempt to adjust him/herself to the teacher's style. When the student shows signs of rebellion, disinterest, or confusion, the teacher may decide that the student just isn't trying, doesn't care, or lacks ability (Bargar and Hoover, 1984). An alternative would be to explore the possibility that there is another variable that needs to be examined.

Gregorc (1984) stated that there is a strong correlation between the learner's disposition, media, and teaching approach. Bargar and Hoover, (1984) stated that learning is a four-way interaction between the learning style of the student, the learning style of the teacher, the type of instructional method, and the demands of the subject area. This same concept has been stated from the instructional side by Keefe (1979) when he said that the quality of instruction is greatly influenced by the particular mix of student characteristics, teacher, approach, and classroom organization. Bell (1986:18) advocated that, "Learning proceeds best if individual learning styles are addressed and teaching activities are planned to utilize those styles." These concepts support Henson and Borthwick's (1984) suggestion that the teacher should develop a number of teaching styles which will provide a variety of learning environments that will match students' learning styles.

If, however, the environment is too comfortable, the learner can become satisfied to remain at that developmental stage of concrete thinking (Joyce, 1984). There needs to be a challenge to the comfort level, but the challenge should not overwhelm the learner. An attempt should be made to find the level of confidence for the student. Different teaching methods can create demands for different skills from different students. Smith and Renzulli (1984) discussed the notion that some students will find a particular method very comfortable, other

students will find the same method somewhat uncomfortable, and still other students will find the same method very stressful. The students who are somewhat uncomfortable can feel some anxiety during the instruction. The students with a very stressful reaction may be unable to learn when that particular method is utilized.

Individual learning systems recognize the need for students to learn in their preferred style, and that teachers have some responsibility to adjust their teaching style to fit the needs of the learners (Henson and Borthwick, 1984). The development of instructional units and lesson plans needs to include activities that address the learning comfort level of students (Kusler, 1979). Through time and specifically designed instruction, the approaches with which students can function at a comfortable, but challenging level, can be expanded to include a wide range of teaching methods. The teacher may attempt to vary class presentation to include a range of learners' preference, and at other times help students learn to use the only method that is presented (Gregorc and Ward, 1977).

The other category of matching teaching styles with learning styles dealt with matching the teaching strategies to be utilized with the student's preferred learning style (Smith and Renzulli, 1984). Teaching strategies are the methods used during instruction, such as lecturing or small group discussions. Teaching strategies or instructional methods are not the same as

teaching styles (Smith and Renzulli, 1984). When matching learning styles to teaching strategies, there are two steps that must be taken beyond matching the appropriate teaching strategy with the students' preferred learning style. Time must be taken to analyze the instructional methods and determine how those particular methods can address or meet the needs of the various learning styles. There are further considerations that must be made depending on whether the student's learning style was determined using a specific instrument designed to measure student learning style, was the student allowed to select the instructional method based on his/her own perceptions of what would best meet his/her needs, or was this information gained informally through observations of the teacher (Smith and Renzulli, 1984). Once the student's learning style preference has been determined, the teacher proceeds to design instruction that would meet the needs of that student or other similar students (Anderson and Bruce, 1979). This approach of meeting the individual needs of the students does not consider the style that is most comfortable for the teacher. The teacher is expected to adjust his/her teaching style to meet the needs of all the students.

There are several factors that would control the decisions of when to use which of these approaches. Consideration needs to be given to the general area of subject matter and, specifically, to the objectives of that particular lesson. Many

times the nature of the objectives or the specific information to be presented will determine the approach that is the most appropriate.

Other considerations would be the students and the teacher. Teaching consists of three elements, teacher, student, and subject matter, and all need to be considered when selecting instructional methods that will be used (Hyman and Rosoff, 1984). Sometimes the teacher will approach instruction through a style that is the least comfortable for the student with the results ranging from inattentiveness to outright resistance. Bargar and Hoover (1984) suggested that the teacher remember to: a) use a non-judgmental approach, b) use concrete, clear, illustrated instructions, c) use demonstrations, and d) use positive encouragement and supportive feedback. These steps can lower the anxiety level of the student and help to make the learning situation more successful. Doyle and Rutherford (1984) have suggested that when reviewing the style preferences of the various students, the teacher must determine which component should be given the first priority, which component is the most important for that particular lesson. A further consideration was stated by Reid (1987) when she cautioned against turning learning style information into stereotypes that could place students in pigeonholes that would deny them the opportunity to develop fully.

The degree of structure needed is just one example of the 21 different modalities that are identified through the Learning Style Inventory developed by Dunn, Dunn, and Price (1979). It is possible to determine the degree of structure that each student will function in most successfully, as well as which resources will be most effective in helping each student achieve the instructional objectives. The average student only shows a strong preference in six to eight of the different modalities (Dunn and Dunn, 1979). When a profile of those modalities has been established where the students with a strong negative or positive preference have been identified, the teacher must design instructional methods or strategies that will assist each student in achieving the stated educational objectives. The Dunn, Dunn, and Price Learning Style Inventory (1979) has five major areas with a number of stimuli within each of those areas, which presents the teacher with thousands of possible combinations that could be required for the students in each classroom. The combinations of cognitive, affective, and physiological style preferences would be different for each student.

Doyle and Rutherford (1984) addressed the problem of the overwhelming task of record-keeping with this approach. The time and energy that would be necessary to maintain records for each student's learning style preference and to identify which teaching strategies were used for each student would be unmanageable. With the time requirements that would be

necessary for these records, the teacher would not have time left for instruction.

The Learning Style Inventory (LSI) developed by Renzulli & Smith (1978) determines student's attitudes toward different teaching methods. This instrument also comes with a corresponding form for the teacher to determine his/her own instructional style. These can facilitate more effectively determined matches of student's learning styles and the instructional methods needed. Using this information, a teacher can determine the learning environment and the instructional methods that will best meet the learning needs of each student. This is more clearly shown in Keefe's (1979) Applied Model of the School Learning Process, Figure 1.

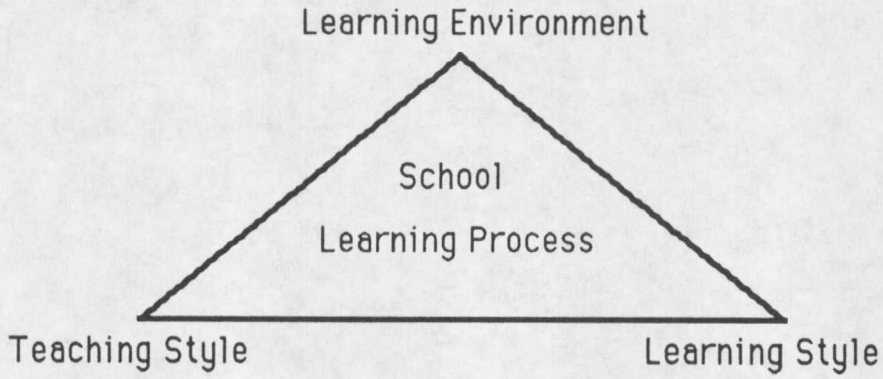


Figure 1. Applied Model of the School Learning Process

An example of learning style information teachers could utilize is that global learners work from the whole to the parts, while analytic learners work from the parts to the whole

(Brennan, 1982). With this background information, teachers should be able to more effectively structure their lesson strategies to present the information in an appropriate manner for both types of learners. This could be done with one lesson where the teacher incorporates both approaches to the information. An alternative strategy could be where the student was allowed to select the assignment that the student preferred from several options. All options would fulfill the objectives of the lesson. The difference would be in the method the student would use to reach the objectives.

Joyce (1984) suggested several approaches that could be used for designing instruction that would best meet the needs of all the individuals involved. One would be to teach students the skills necessary to learn in each of the many different environments. In other words, teachers need to help students learn the basic skills that will enable them to learn the information in several different modes. Another approach would be to select the instructional model that was best suited to the objectives, but modify the model for different learners, such as more structure or less structure depending on the individual learner. The third approach would be to eliminate the environment that is marginal for that learner. A major weakness with this approach is that it would be difficult to find enough instructional models that would meet the instructional objectives as well as the student's needs (Joyce, 1984). Guild

and Garger (1985:88) also reacted to the varying points of view on this issue when they stated: "Some researchers believe that schools and teachers must adapt [to student's learning styles]. Others believe that learners must be given the skills required for success in school, and still others advocate a little bit of each."

Effective Schools and Teacher Expectations

Information regarding effective schools has been gathered through intensive studies of schools that have been termed effective (Lewis, 1986). Researchers then examine these schools in an attempt to identify the characteristics that effective schools have in common. "Deciding what is effective or exemplary or deserving of recognition is a slippery and subjective undertaking" (Lewis, 1986:187). This process is subjective and could overlook variables that would add considerably to the knowledge of effective schools. Edmonds and Lezotte (1982) in their, "The Correlates of School Effectiveness," discussed a summary of the correlates of school effectiveness from the research literature. The five major correlates were discussed in the following order: "administrative style", "instructional emphasis", "school climate", "teacher conveyance of academic expectations", and "use of achievement data for program evaluation." They further divided "teacher conveyance of academic expectations" as the teacher having a clear understanding of the minimum body of knowledge expected at

each grade level, and the teacher possessing behaviors that convey to students the idea that all students are expected to attain those minimum levels of mastery. Although their "list" is not a complete summation of the research, the five components listed are common to most research and reports dealing with effective schools (Brophy, 1986; Brookover, 1982).

Many of the comments regarding individual student's abilities or capabilities that are heard in some teachers' lounges can produce lower expectations of achievement by other teachers for that particular student as well as for the teacher making the comments. When this situation occurs, the teacher is not intentionally lowering his/her expectations for that student, nor is the teacher intentionally lowering the expectations of the other teachers for that particular student. This is true of most of the behavior patterns that teachers exhibit when communicating lower expectations of student achievement. Once teachers become aware of these behavior patterns and learn behavior patterns that communicate high expectations of achievement, they will exhibit the positive behavior patterns. Teachers in effective schools do not lower either the school's standards or their own for students, but prepare the students to be able to meet or exceed the expected levels of achievement (Lewis, 1986).

Teacher Expectations

The current interest in the area of teacher expectations began with the study done by Rosenthal and Jacobson in 1968 in the Oak School Experiment, more commonly called the Pygmalion Study. This study has produced a great deal of controversy because of weaknesses in the design and format of the research project itself. The skeptics of this study have criticized the fact that there were no classroom observations, as well as the conclusions that were drawn from the results (Brophy 1983). Although there has been a great deal of work done in the area of teacher expectation effects and the self-fulfilling prophecy, the positive results from this study have never been replicated when using the same procedures. At the other end of the spectrum, are people who have supported the findings and seem to believe that as soon as all teachers are trained in demonstrating high expectations for student achievement, students will begin to achieve at higher levels than they are presently achieving (Brophy, 1983). As with most controversies, the truth is likely to exist somewhere between the two extremes. Within the tremendous body of research of effective schools and investigations into the components that make up an effective school, the subject of teacher expectations has surfaced as one of the major components.

There have been many different points of view and many different interpretations of the initial work done by Rosenthal and Jacobson. The fact remains that the study brought this issue to the awareness of educators and the public. Whether the procedures were designed correctly or the findings were accurate representations of the research is no longer the most important factor. This study was just one of many that have investigated the area of teacher expectations. Once the issue was addressed as an area that needed to be investigated in detail, the specific evidence and findings of the Pygmalion Study have become less important. Brophy (1986) in a review of the literature of teacher expectations discussed eight different aspects that have been addressed resulting in an improvement of the more current research. He (1986:1069) went on to state that:

> Due to such improvements, the 1970's yielded a substantial collection of replicated correlational findings as well as several experimental studies that documented causal relationships between teacher behaviors and student achievement.

Several problems exist in developing and researching the question of teacher expectations. One of the first problems has been that of developing a consistent definition of what was meant by teacher expectations (Brophy, 1983). With the definition changing from one researcher to another and from one reviewer to another, there has been a great deal of confusion as

people have tried to relate one study to another when different definitions have been utilized. A second area of concern has dealt with the differences in basic design of the research projects (Brophy, 1983). Some studies created fictitious students and asked teachers to predict achievement levels based on the information in a school record file. Other studies asked teachers to rank order the achievement levels of students who had just entered their classroom. A third method has asked teachers to predict levels of achievement of students who have been in their classroom for a period of time and with whom the teachers have had an opportunity to have classroom interaction. A final example of attempts to evaluate teacher expectation has been by the observation of both verbal and nonverbal treatment of various ability level students by different teachers. Frequently, the behavior of the teacher has told more than the verbal interaction between the teacher and the student about how and what the teacher expected from that student (Cooper, Findley, and Good, 1982). It has been suggested that expectation effects are the consequence of spontaneous but recurring affective responses of teachers.

In an attempt to clarify what topics within teacher expectations have been researched, Thomas Good (1982:26) has developed the following:

1. The teacher expects specific behavior and achievement from particular students.

2. Because of these varied expectations, the teacher behaves differently toward different students.
3. This treatment communicates to the students what behavior and achievement the teacher expects from them and affects their self-concepts, achievement, motivation, and levels of aspirations.
4. If this treatment is consistent over time, and if the students do not resist or change it in some way, it will shape their achievement and behavior. High-expectation students will be led to achieve at high levels, whereas the achievement of low-expectation students will decline.
5. With time, students' achievement and behavior will conform more and more closely to the behavior originally expected of them.

Dusek and Joseph (1983) suggested an area that was considered by many as the most important area for future research deals with conducting research with classroom teachers and their own students as opposed to fictitious students whom the teachers have never met or interacted with in the classroom.

Communication of Teacher Expectations

Good and Brophy (1980), based on several of their studies regarding communication of teacher expectations, suggested that most teachers fit into one of three categories when interacting with low achieving students. These are the overactive teacher, the reactive teacher, and the proactive teacher (Good, 1982). The overactive teacher appeared to exaggerate the initial deficiencies of the low achievers. The reactive teacher seemed to give high achievers more opportunities to interact with the teacher by calling on the high achievers more frequently to answer questions than low achievers. The third category was made up of proactive teachers, who didn't allow their expectations for low achievers to interfere with the teacher's attempts to teach these lower achieving students.

Within a single year, low achievers are asked to adjust to a wider range of expectations than are high achievers (Brophy, 1983). Brophy continued that the manner in which teachers interact with high achieving students is generally consistent; however, there is not the some consistency among teachers when interacting with low achieving students. Not only is there no consistency among teachers for dealing with low achieving students, but these same students are exposed to more teachers, each with his/her own way of interacting and expressing expectations. These additional teachers are in the form of

remedial reading teachers and remedial math teachers. High achievers have been encouraged to ask questions, to contribute to class discussions, and to succeed within this type of instructional system (Good, 1982). The rewards high achieving students receive have prompted them to continue with the behavior that earned these rewards. The response that the high achiever receives is generally consistent with most teachers (Good, 1982). When a student volunteers and answers a question correctly and receives praise for that correct answer, that student will continue to volunteer and participate in the class discussion.

Low achievers very often become discouraged from participating in the interaction of the class. When low achievers do attempt to participate, some teachers will pass them by and seek a response from a student the teacher feels will have a better chance of answering the question correctly. The teacher will often rationalize this situation by telling him/herself that he/she didn't want to embarrass the student when the student didn't know the correct answer. Other teachers will give the correct answer to the student without giving clues or attempting to lead the student to the correct answer. Still other teachers will give rewards for partially correct answers or incorrect answers. Many times the student will feel that the teacher doesn't expect the correct answer, and therefore, didn't give the student an opportunity to participate in the same manner as

higher achieving students. A low achieving student then becomes less likely to risk possible rejections by volunteering another time.

A proactive teacher will call on the low achieving student and, if the student doesn't know the answer or can't express the answer clearly, the teacher will draw out the student leading him/her to the correct answer. In this manner everyone benefits from the learning situation. The high achieving student could see the problem from a different perspective and perhaps understand the information more clearly, the low achieving student can feel a degree of success in being able to answer the question to the satisfaction of the teacher and will perhaps risk answering questions more frequently in the future, and the teacher will gain the inner satisfaction of seeing a student grow and develop his/her self-concept as well as acquire some needed information. Discontinuities of expectations are useful when needed and appropriate, but in most cases sharp differences in work expectations that teachers hold for different students need to be explained to students (Good, 1982). The differences in teacher expectations could be the result of many different factors; however, these differences should not affect the interaction between the student and the teacher in the classroom.

Kerman (1979:716) indicated that "Normally, one defines low achievers as those students functioning below grade-level

expectancy; high achievers function above grade level." The relative nature of characteristics on a continuum must be remembered during any discussion of high and low achievers. Students are seen as high, low, or in between only in relationship to others. In every instructional group or classroom, there are students that are viewed as high achievers and those students that are viewed as low achievers. A seventh-grade student working to the limits of his ability in a remedial class is viewed as a high achiever, and by the same token, a student having difficulty in an advanced chemistry course can be viewed as a low achiever. Each of the students in the preceding example could be seen as the opposite level of achieving student in a different setting. In an advanced seventh-grade math course, the seventh-grade student would probably be seen as a low achiever and treated as such, and the chemistry student would be seen as a high-achiever in an introductory physics course. The terms high and low achievers are relative, and regardless of the classroom or situation, if there is more than one student in a learning environment there will be high and low achievers. Kerman (1979:716) stated "The point is that all classrooms, regardless of number enrolled, curriculum content, grouping strategies, etc., will, in the eyes of the teacher, have low and high achievers. And how they are perceived will predictably determine how they are taught from day to day."

Students are very often able to perceive how teachers view their ability levels and will frequently live up to the expectations they feel the teacher holds for them whether those expectations are high or low (Brattesani, Weinstein, and Marshall, 1984). Students tend to feel that teachers are better able to evaluate the student's potential than the student him/herself. Students accept how teachers perceive the students ability levels without question. These perceptions very often become self-fulfilling prophecies of either high or low achievement levels. "Our findings heavily underscore the important role of student perceptions of teacher treatment in the mediation of the self-fulfilling prophecy in the classroom" (Brattesani, Weinstein, and Marshall, 1984:246). Clifton et al. (1986:59) concluded that there are four steps in the operation of teacher expectations in the classroom.

> First, differential expectations are established within the classroom and are accepted by both the students and the teacher. Second, certain students begin to be treated differently in accordance with the differential expectations held by the teacher. Third, in response to differential treatment, each student tends to exhibit behavior that complements and reinforces the teacher's expectations. Finally, over a period of time, differences in the teacher's expectations are reflected in the achievement levels of the students and the social organization of the classroom.

It is important to remember that the student's perceptions of teacher expectations are not always accurate nor do they always match those of the teacher. Brophy (1983) stated that the teacher expectation effects can raise or lower students level of achievement by an average of as little as 5% or as much as 10%. These differences become even more significant as they are compounded over several school years.

There have been several different rationales for why students aren't motivated to achieve in school. Setting appropriate standards for achievement is an important consideration in improving achievement levels. If students are to achieve at 'normal increments', the goals and standards of achievement levels must be appropriate for the student's grade and maturation level. It is important that students be involved in setting standards for their own achievement level rather than just comparing their achievement level to others (Cook, 1983). Children should not be made to feel that they must achieve at equally high levels in all areas. Individual differences must be taken into account as children learn to evaluate their own efforts. Adults sometimes make students feel that they must be all things to all people at all times (Cook, 1983). It is an easy trap for parents and teachers to fall into, but they should be aware of this tendency and guard against it. When parents and teachers are attempting to encourage children to be all that they can be, it can be confusing to children and make them feel that

they must achieve at high levels in everything they do. Unfortunately, children will sometimes decide that they cannot achieve at the level that is expected of them, and therefore, they should not waste their time and energy in attempting what they feel they cannot obtain.

When teachers become involved with culturally different students there are several important considerations that must be addressed. Clifton et al., (1986:58) stated that, "Despite the emphasis on universalism in education, there is considerable evidence that teachers do not always treat their students according to univeralistic principles." Teachers need to stress, both in the classroom and to themselves, that different means just that--different, not better or worse. The students from a different culture should be made to feel that their differences are not negative, but that the differences are acceptable and appreciated (Baker, 1983). Sometimes teachers become so involved with the content areas and the information that needs to be covered they overlook the value of their attitudes and expectations, especially in regard to minority students. Teachers must guard against having lower expectations for minority students when those expectations are based solely on the fact that the students are from a cultural background different from their own.

On the other side of this issue, minority students and their parents must overcome the tendency to accept and use excuses

for poor performance levels. It has been suggested that perhaps by allowing a poorer quality of class work and lower levels of achievement, minority students have come to accept the notion that they cannot achieve at the same levels as students from the majority background (Pinkney, 1982). If the cultural differences are adequately dealt with, and minority students are made to feel they are on the same level as other students, then perhaps these students will no longer need the crutch of lower expectations.

Factors That Contribute to Teacher Expectations

Research has shown there are some specific areas which contribute to the formation of teacher expectations. In a meta-analysis of these studies, Dusek and Joseph, (1983) reported that a majority of the studies dealing with the factors that affect teacher expectations have been concerned with the attractiveness of the student to the opposite sex, attributes of personality traits, and the teacher's evaluation of transgressions.

An example of research illustrating teachers' attitudes to students that had been described as problem students was done in the public schools of England. Mathews (1982) conducted a study that dealt with student achievement levels in chemistry classes in a very structured teaching situation, the public school system of England. Twelve groups of randomly-selected mixed

ability students in chemistry were selected to participate in this study. A class with a bad reputation did poorly although the class had an average distribution of higher ability students. The mean on the final test was 50.2 for all students taking the class, while the class with the attitude problem, 3S, had a mean score of 40.4 which was second from the lowest mean score for the twelve groups. It was felt by the instructors that the students were poorly behaved as well as unintelligent. Mathews (1982:497) sited two difficulties in measuring these effects. "The first was the difficulty of finding groups between which valid comparisons could be made. The second difficulty arose from the complex nature of the teaching situation." However, the results tend to support the concept of lower expectations for students who were poorly behaved in the classroom setting.

Classroom behavior patterns, self-confidence of the students, and the ability of the student to work independently have been shown to have a larger and more enduring correlation with teacher expectations of achievement than physical characteristics of individual students. A student's name as well as the student's family background situation have been shown to have an effect on a teacher's expectations for achievement. Different studies have shown that each of these different factors can have an effect on the expected achievement level of students (Dusek and Joseph, 1983).

Teacher expectations research findings showing how lower achieving students are dealt with in the classroom have been summarized by Jere Brophy (1981:416). Brophy compiled the following list from his summary:

1. Seating slow students farther from the teacher or in a group (making it harder to monitor low-achieving students or treat them as individuals).

2. Paying less attention to lows in academic situations (smiling less often and maintaining less eye contact).

3. Calling on lows less often to answer classroom questions or make public demonstrations.

4. Waiting less time for lows to answer questions.

5. Not staying with lows in failure situations (providing clues, asking follow-up questions).

6. Criticizing lows more frequently than highs for incorrect public responses.

7. Praising lows less frequently than highs after successful public responses.

8. Praising lows more frequently than highs for marginal or inadequate public responses.

9. Providing low-achieving students with less accurate and less detailed feedback than highs.

10. Failing to provide lows with feedback about their responses more frequently than highs.

11. Demanding less work and effort from lows than from highs.

12. Interrupting the performance of low achievers more frequently than that of high achievers.

There doesn't seem to be a comprehensive study that has addressed all of these components within the design of one study. It would be interesting to see these factors compared and rank-ordered as to which factors had an effect on the formation of teacher expectations and to what degree each identified factor contributed to teacher expectations. Just being aware that these various factors could have an effect on how teachers view their students should help to minimize the impact of these factors on student achievement. Guskey (1982:348) stated that "Under more effective instructional conditions teachers may interact similarly with high- and low-expectancy students, provide similar types of praise for each, provide similar kinds of feedback to each, and make comparable demands for work and effort of each."

Most of the research on teacher expectations deals with the initial views of the teacher in regard to students expected level of achievement. Those studies that have examined the effects of these factors over a longer period of time or after the teacher has had an opportunity to interact with the students, indicate the effects are diminished over time (Brophy, 1983). This concept was supported by Guskey (1982:348) when he stated that "As teachers adopt more effective instructional practices and as a result, experience a change in their effectiveness with

students, the relationship between their initial expectations for performance and (actual) student achievement outcomes does appear to be reduced."

Effective Communication of Expectations

In today's climate of accountability in education and the need to measure the justification of innovations in the classroom in monetary terms, the area of teacher expectations of student achievement would appear to withstand this criteria. Schools have an obligation to assist each student in maximizing his/her educational potential. Conveying positive expectation levels to students has become a major component as schools move toward becoming more effective. The financial burden to a school district would be minimal because there would be no need for extensive retraining of teachers nor would there be costly equipment or material demands. Brophy (1986:1075) advocated that:

> This implies, and experimental studies confirm, that school improvement efforts based on principles derived from process-product research will not face the feasibility and cost-effectiveness problems that often plague attempted innovations based on principles developed outside the classroom setting.

The inservice setting is one method of providing teachers with effective ways of interacting with both high- and low-

achievers, minority and non-minority students. With leadership from both administrators and curriculum specialists, information can be presented regarding how teacher behavior can differ between high achieving students and low achieving students. Another method of providing examples of successful interaction can be done through observations of successful classroom communications through visual aids or on-site visitations to classrooms where these effective methods are practiced. Teachers need to be reminded that student failure calls for reteaching rather than a rationalization of those failures. Finally, the school system can be encouraged to develop a coordinated curriculum. It is important to build meaningful continuity and variety across consecutive grade levels. Research indicates that in effective schools, higher expectations for student achievement are part of a pattern that maximizes their students learning gains (Good, 1982). The literature does show that students are more likely to move toward the expected behavior and achievement levels rather than away from that which is expected. It would seem to follow then that if teachers have high as well as positive expectations of all their students, those students would move toward fulfilling that prophecy (Brophy, 1983).

The specific procedures used to conduct this research project are outlined in Chapter 3.

CHAPTER 3

PROCEDURES

Introduction

The problem of this research project was to determine if there was a relationship between the match or mismatch of learning style preference of students and teachers, actual student achievement, and teacher expectations of student achievement. The attribute variables of student gender, student age, student attitude toward school, student ethnicity, and the student's family structure were examined to determine the contribution each made toward the formation of teacher expectations of student achievement.

To report the procedures used during this research project, the following components were identified and make up the major divisions of this chapter.

1. Population Description
2. Control of Extraneous Variables
3. Methods of Collecting Data
4. Methods of Organizing Data

5. Analysis of Data
6. Statistical Hypotheses
7. Precautions Taken to Insure Accuracy

Population Description

The population of this study consisted of 160 students enrolled in regular classrooms in grades seven through twelve at the Naknek School of Bristol Bay Borough School District and at the Newhalen School of The Lake and Peninsula School District. These students had not previously been enrolled in a class taught by the participating teacher. By restricting the population to those students new to each teacher, it eliminated the possibility that the teacher had preconceived expectations about the achievement levels of the students.

Students enrolled in the Naknek School of the Bristol Bay Borough School District come from the communities of Naknek, South Naknek, and King Salmon. Naknek, the seat of the borough government, is located at the mouth of the Naknek River. Naknek has developed over the years as a major fishing and salmon processing center. In late May, the king salmon run starts the fishing season, followed by the red salmon in late June and the pinks in July, silver and chum runs finishing up in the fall. At the peak of the season, 4000 to 5000 people are employed in the fishing industry in the Naknek area. Although relatively few are

full-time local residents, fishing does provide the economic base for the community. South Naknek is located across the river from Naknek and is accessible by water or air. A number of salmon canneries and processors are located in South Naknek providing the economic base for that community. The village has a grade school with grades kindergarten through six, but students in grades seven through twelve are flown to Naknek daily for classes. King Salmon is connected to Naknek by a 15-mile road with students from King Salmon being transported to Naknek by bus for classes. King Salmon has become a regional transportation center, having a 10,000 ft. paved and lighted runway with modern airport facilities. A number of state and federal agencies are located in King Salmon such as the U. S. Air Force base, Federal Aviation Administration, U. S. Park Service, State Department of Transportation, Alaska State Troopers, National Oceanic and Atmospheric Administration, and Alaskan Department of Fish and Game. Sportsmen and other recreational users travel through King Salmon to Katmai National Park as well as other parts of the region. Government jobs offer the main source of year-round employment in King Salmon. The King Salmon Air Force Base is self-contained, and does not contribute substantially to the local economy. There are no facilities for family housing on-base, nor do military personnel live off-base. The year-round population of the borough is roughly 2000 people which includes the 375 people stationed at the Air Force base.

The population of Bristol Bay Borough is composed of several minority groups which include: Alaska Natives, both Aleut and Eskimo, Blacks, and Asians.

The class size at the Naknek School of grades seven through twelve ranged from 14 to 24 students. There were approximately 120 students enrolled in regular classrooms in grades seven through twelve at the Naknek School with 15 teachers for those grade levels. Seventy-two students were identified as being in a teacher's classroom for the first time. However, a number of students were identified by more than one teacher, which produced multiple rates for some students. There were a total of 114 student cases that participated in this study from the Naknek School. Students were assigned to classes by grade level and subject area. Teachers were assigned to classes based on their areas of concentration during teacher training and administrative decision. Because of the size of the classes and the school, the entire population participated in this research project.

Students enrolled in the Newhalen School of The Lake and Peninsula School District reside in two communities, that of Newhalen and Iliamna which are connected by a five-mile gravel road. The children living in Iliamna are daily transported by bus to Newhalen where the school is located. Newhalen, a community of approximately 150 people, is located on the north shore of Lake Iliamna at the mouth of the Newhalen River. Iliamna, a

community of approximately 75 people, is located five miles east of Newhalen along the north shore of Lake Iliamna. The residents of these communities are Aleuts, Eskimos, and Caucasians. The only air terminal for scheduled airline service on the lake is located at Iliamna with transportation and mail service provided by Ryan Air four days a week during most of the year. The economy of this area is based on the red salmon fishery of Bristol Bay. Lake Iliamna is a prime red salmon spawning area and is connected to Bristol Bay through the Nushagak and Kvichak River systems. There are a large number of hunting and fishing lodges within the Iliamna-Newhalen area that provide seasonal employment and contribute to the economic base of these communities.

The class size at the Newhalen School ranged from 5 to 15 students in a classroom during each class period. There were 20 students enrolled in regular classrooms grades seven through twelve with 3 teachers for those grades. The three teachers were all new to the Newhalen School and, therefore, all 20 students were instructed by these 3 teachers for the first time. Because more than one teacher rated each of the students, there was a total of 46 student cases from the Newhalen School. Each classroom was multi-graded with the teacher teaching more than one grade level during a single class period. Students were assigned to classes by grade level and subject area. Teachers were assigned to classes based on their areas of concentration

during teacher training and administrative decision. Because of the size of the classes and the school, the entire population participated in this research project.

Seven of the teachers teaching grades seven through twelve in the Naknek School and three of the teachers teaching grades seven through twelve in the Newhalen School volunteered to participate in this study. Six of the teachers were male and four of the teachers were female. One of the teachers was Native American and the other nine teachers were Caucasian. Five of the teachers preferred the Assimilator learning style, four preferred the Converger learning style, and one teacher preferred the Diverger learning style as measured by Kolb's Learning Style Inventory (1985).

Teachers who participated in the study identified students who were enrolled in their classes for the first time during the first semester of the 1987-88 school year. The identification process produced 187 students at the two sites. During the course of this study 27 students were eliminated from the study for several reasons. Some students transferred out of the participating teachers' classrooms, some students did not complete the course of study for the first semester, and therefore, received incompletes for grades for the first semester, and some students transferred out of the respective school districts. This left 160 students who participated in the study to its completion.

Of the 160 students who participated in the study, 83 were male and 77 were female. Information regarding age of students was tabulated in three groups of low, medium, and high. The low group was comprised of students aged 12 to 14, the medium group was comprised of students aged 15 to 16, and the high group was made up of students aged 17 to 18. Generally, the low age group represented seventh- and eighth-grade students, the medium age group represented ninth- and tenth-grade students, and the high age group represented eleventh- and twelfth-grade students. There were 72 students in the low age group of 12- to 14-year olds, 60 students in the medium age group of 15- to 16-year olds, and 28 students in the high age group of 17- to 18-year olds.

Control of Extraneous Variables

There were several extraneous variables that had to be controlled to eliminate the possibility that the results of this research project were due to those extraneous variables rather than the identified independent variables under investigation. The variables that were determined to be possible contaminants were: student age, student gender, student ethnicity, student attitude toward school, and the student's family structure. These variables were controlled through statistical analysis (Ferguson, 1981).

Recent research in brain growth shows that most students are able to carry out concrete operations by the time they have reached age twelve. Epstein (1978) stated that while students find it easier to acquire new and higher levels of cognitive abilities during growth spurts, it is also true that students find it very difficult to develop new and higher levels of cognitive abilities during a plateau. He further stated that during the in-between years of 12 to 14, most students, 85 to 90 percent, have plateaued in brain growth, and a majority of students in this age group have not developed the ability to function at a formal operations level or an abstract thinking level. The planning of learning activities should be centered around strategies that will help students learn to consolidate and develop the thinking skills acquired during the last growth spurt. It is very important that these students not be put into the position of being expected to handle thought processes they are not capable of accomplishing at that particular stage of their development (Toepfer, 1979).

One of the major areas learning style inventories assess is the subject's preference for thought processing through abstractness or concreteness. Students enrolled in grades seven through nine are generally 12 to 14 years of age, or in the middle of a brain plateau between concrete operations and abstract thinking levels. There is a possibility that the learning style preference of students could have been attributed to the

student's present level of brain growth and development rather than a true learning style preference. The variable of student age, therefore, had to be examined to determine if student preference was due to age rather than a true learning style preference. A two-way analysis of variance was used to determine if any difference in variability of student learning style preference was the result of student age (Ferguson, 1981). The independent variables in this analysis were student age and student learning style preference with teacher expectations of student achievement as the dependent variable. When interaction was present, student age and student learning style preference would have a unique effect on teacher expectations of student achievement.

The tendency of people to use the processing style of one hemisphere rather than the processing style of the other hemisphere has been identified as hemispheric preference (Zenhausern, 1982). The hemispheric preferences are identified by the way each half of the brain processes information (Sinatra, 1982). The dominant information processing style of the right side of the brain is holistic and intuitive with the functions of the right hemisphere, primarily divergent. The dominant information processing style of the left side of the brain is analytical and logical with the functions of the left hemisphere, primarily convergent. It must be remembered that both hemispheres of the brain are used by everyone with varying

reliance on one side over the other, and the preferences are expressed along a continuum (Zenhausern, 1982). Current brain research shows that females tend to be more left-brained and males tend to be more right-brained (Rubenzer, 1982). Therefore, to examine the possibility that gender could have effected the learning style preference of the students, the variable of gender was controlled through statistical analysis. A two-way analysis of variance was used to identify any difference in variability that resulted from student gender (Ferguson, 1981). The independent variables in this analysis were student gender and student learning style preference with teacher expectations of student achievement as the dependent variable.

Dusek and Joseph (1983) have found that ethnicity can be a factor in the formation of teacher expectations. There are several ethnic groups within the Bristol Bay Borough School System and The Lake and Peninsula School District. These include: Whites, Blacks, Asians, and Alaskan Natives including Aleuts, Eskimos, and Athapascan Indians. The variable of students' ethnicity, therefore, had to be examined. Within this study there were many students who identified themselves as a mixture of the Alaskan Native group; therefore, these students were combined into one group. Only three students identified themselves as having an ethnic background other than Caucasian or Alaskan Native and, because of this small number, these students were dropped from analysis regarding ethnicity. There

were 90 Alaskan Native students and 67 Caucasian students who took part in this study. A two-way analysis of variance was used to control for any difference in variability that resulted from student ethnicity (Ferguson, 1981). The independent variables in this analysis were student ethnicity and student learning style preference with teacher expectations of student achievement as the dependent variable.

Currently, there are several different family structures that exist in our society. The traditional family structure consists of both mother and father living together in the same home with the child(ren). Another family structure that is less traditional, but becoming more common, is the single parent as head of the household, usually the mother, who is responsible for the major portion of the child's rearing. A final family structure considered is when the child(ren) resides with an adult other than his/her parent, who might or might not be a relative. The literature suggested that the type of family structure which the student came from could be a factor in the formation of teacher expectations, when Dusek and Joseph (1983:340) stated that "Teachers may have different attitudes toward children from different family situations, and this may be a source for forming expectancies". The category of the student's family structure was divided into three groups. The first group was made up of those students living with both parents, the second group was made up of those students living with one parent, and the third

group was made up of those students who lived in some other family structure, which could have been with a family member other than a parent or someone other than a family member. There were 101 of the students who lived with both parents, 48 students lived with one parent, and 11 students who lived in some other structure. A two-way analysis of variance was used with the family structure of the student and student learning style preference as the independent variables and teacher expectations of student achievement as the dependent variable (Ferguson, 1981).

There has been much discussion concerning the relationship of student attitude toward school and teacher expectations. Although there is no clear evidence that student attitude toward school is the result of teacher expectations, Brophy (1983) does discuss the effects of the self-fulfilling prophecy theory in regard to students' performance in school.

To investigate the effects on teacher expectations of student achievement that might have been the result of student attitude toward school, a two-way analysis of variance was used with student attitude toward school and student preferred learning style as independent variables and teacher expectations of student achievement as the dependent variable (Ferguson, 1981).

Methods of Collecting Data

Three of the teachers of grades seven through twelve at the Newhalen School in The Lake and Peninsula School District and seven of the teachers of grades seven through twelve at the Naknek School of the Bristol Bay Borough School District volunteered to participate in this research project. During the fall semester of 1987, these teachers identified the students enrolled in their class for the first time. The identified students participated in this research project. Each teacher rated each identified student on a five-point scale as to the level of achievement the teacher expected from that student on an information sheet developed by the researcher (Appendix B). Teachers used a five-point scale where five (5) was high and one (1) was low. The five-point scale was selected to correspond with the five-point grading scale, used at both schools, of A, B, C, D, and F. Actual student achievement as measured by first semester grades and teachers' expected levels of achievement were analyzed to determine if there was a relationship between actual achievement and expected achievement.

The demographic data of student age, student gender, student ethnicity, and student family structure were gathered from the students through the use of a demographic sheet developed by the researcher (Appendix A). The names of students

and teachers were used to insure accuracy in compiling the data, but the names of students and teachers have not been reported.

Learning style preference for both teachers and students was measured using the "Learning Style Inventory" developed by David Kolb (1985). The "Learning Style Inventory" (LSI), chosen because it identifies learning styles that are a combination of perceiving and processing information was developed from Kolb's Model of Experiential Learning. Kolb's Model was based upon the Jungian concept of individual styles and personality types (Kolb, 1985). Technical data of this instrument revealed an internal consistency reliability of the four learning styles of .73 to .83 when measured by Cronback's Standardized Scale Alpha. The "Learning Style Inventory" was revised in 1985 and the Spearman-Brown reliability coefficient was done between the old Learning Style Inventory and the revised Learning style Inventory. This reliability coefficient of the four learning style preferences ranged from .87 to .92 indicating the two instruments were closely related (Kolb, 1985).

People perceive information on a continuum from concrete experience to abstract conceptualizing and process experiences and information on a continuum from reflective observation to active experimentation (Kolb, 1984). The four modes of Kolb's Learning Style Inventory are: Concrete Experience (CE), Reflective Observation (RO), Abstract Conceptualization (AC), and Active Experimentation (AE). This instrument consisted of

twelve partial sentences with a group of four words to be rated from one (1) to four (4) by the respondent to complete the sentence. Each of the words represented one of the four modes of learning style preference as defined by Kolb.

A numerical value, ranging from one to four with four (4) representing the most preferred and one (1) representing the least preferred, was assigned to each word in each group of four words providing a rank-order of the four words to complete the twelve sentences. The numerical columns were totaled. These totals produced a score for each of the four learning modes. The Concrete Experience score was subtracted from the Abstract Conceptualization score, and the Reflective Observation score was subtracted from the Active Experimentation score. This produced two combination scores which were used to plot the point of interception on the Learning-Style Type Grid, or data point in each of the four quadrants. The quadrants were identified as: Accommodator, Diverger, Converger, and Assimilator on the Learning-Style Type Grid, Figure 2.

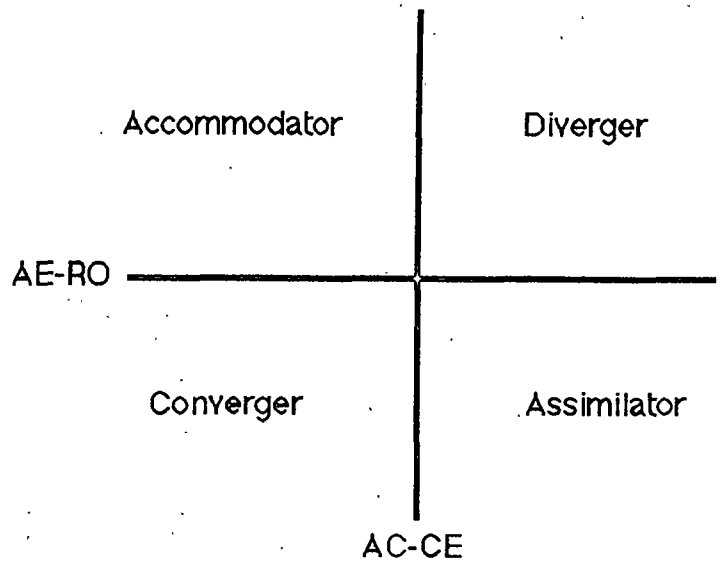


Figure 2. Kolb's Learning-Style Type Grid.

There were 44 students who preferred the Diverger learning style, 38 students with the Converger learning style preference, 25 students who preferred the Accommodator learning style, and 53 students with the Assimilator learning style preference.

The Quality of School Life Scale developed by Epstein and McPartland (1978) was used to assess the attitudes students had toward school. The grade range for this instrument is grades four through twelve. There are three sub-scores that are related to individual student's satisfaction with school, individual student's commitment to classwork, and individual student's reactions to teachers. The Satisfaction with School subscale deals with students' general reactions to school. The

Commitment to Classwork subscale assesses students' interest in completing classwork as well as the classwork's value. The Reactions to Teachers subscale looks at the students' opinion of classroom instruction and the teacher's personal interaction with the students. Technical data on the instrument revealed an overall Kuder-Richardson reliability of .87 and .89 for secondary and elementary students, respectively as measured by Kuder-Richardson Formula 20 and Formula 8. The Kuder-Richardson Formula 20 reliability coefficient ranged from .79 to .81 for the Satisfaction with School subscale, .72 to .80 for the Commitment to Classwork scale, and .64 to .73 for the Reaction to Teacher subscale. The Quality of School Life (QSL) reliability coefficients for the subgroups range from .82 to .91 for the 27-item scale.

The standard error of measurement showed the discrepancies between obtained scores and true scores. For the QSL, the standard error of measurement was 1.99 and 2.14 for the elementary and secondary samples, respectively. Therefore, 95% of all students' scores were expected to be within 4 points of their true scores, which suggested that the QSL could be used with confidence.

To establish construct validity, intercorrelations were done between each of the subscales. These intercorrelations were high as the subscores examine the concept of the quality of school life. Sechrest's incremental validity methods were used

to examine the relationship of the subscales to a number of external variables such as participation in activities, absence rate, hours of homework, college plans, frequency of getting into trouble, and students' opinion of teachers' fairness in grading. Results strongly suggest that each of the subscales was responsive to a different dimension of schooling.

The Quality of School Life Scale (Epstein and McPartland, 1978) provided tables to convert the raw score by grade to high attitude, medium attitude, and low attitude toward school. These tables were used to determine the attitude level toward school for each student who participated in the study. There were 58 students with a high attitude toward school, 80 students with a medium attitude toward school, and 22 students with a low attitude toward school.

Methods of Organizing Data

StatView 512+ was the statistical program that was selected to analyze the data gathered from this research project (Cuneo and Feldman, 1986). This statistical program allows for the following types of data to be entered: integer, real, long, category, and string. Data of the category type were entered in alpha-numeric form and were treated as belonging or not belonging, which eliminated the necessity of coding the data to be entered for statistical analysis.

Statistical Hypotheses

Each of the hypotheses were tested at the .10 level of significance to reduce the probability of making a Type II error. A Type I error would occur if a true null hypotheses was rejected. Within this study, a Type I error would have rejected the hypothesis that there is no relationship between the dependent variable, teacher expectations, and each of the independent variables, such as student learning style preference. This would have stated that there was a relationship when one did not exist. A possible consequence of this would have been that teachers would have been made aware of the relationships, and, possibly through inservice training, the teachers would have adjusted their teaching styles to reflect an awareness of learning style differences among students. The draw backs of making a Type I error would have been the time and expense of the inservice training for teachers when there was no need for training that dealt with learning style preferences.

A Type II error would have been where a false null hypothesis was retained. In the context of this study, a Type II error would have retained the concept that there was no relationship between the dependent variable, teacher expectations, and one or more of the independent variables such as student learning style preference, when, in fact, there was a relationship. Learning style differences would have continued to

contribute to the formation of teacher expectations. This could have resulted in some students not achieving at the higher levels at which they are capable simply because the teachers' do not have an awareness of learning styles which could help to meet the needs of students.

The consequences of making a Type I error would be the expense of time and money for inservice training when inservice training is required by Alaskan law. While the consequences of making a Type II error are the chances that students will not achieve to their full potential. It is much more important that students be provided every opportunity to achieve, particularly when the cost in time and money would be minimal. The researcher decided that for the purposes of this study, the hypotheses would be tested at the .10 level of significance, because the consequences of making a Type II error would be more detrimental to students and education, in general, than making a Type I error. The general questions outlined in Chapter 1 were answered by testing the following null (Ho) hypotheses:

1. Ho: The R^2 between the dependent variable (teacher expectations of student achievement), and the independent variables (match or mismatch of student and teacher learning style preference, actual student achievement, student age, student gender, student ethnicity, student attitude toward school, and the student's family structure) was 0.

2. Ho: The Beta weights associated with the independent variables were zero (i.e., $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0$).

3. Ho: There was no intercorrelation among the independent variables of match or mismatch of student and teacher learning style preference, student gender, student age, student ethnicity, student attitude toward school, student's family structure, and actual student achievement as measured by first semester grades.

4. Ho: There was no interaction between the independent variables (student learning style preferences and student ethnicity) on the dependent variable (teacher expectations of student achievement).

5. Ho: There was no statistically significant difference between the mean scores of teacher expectations of student achievement of Caucasians and Alaska Natives.

6. Ho: There was no statistically significant difference between the mean scores of teacher expectations of student achievement among the student learning style preferences.

7. Ho: There was no interaction between the independent variables (student learning style preference and student gender) on the dependent variable (teacher expectations of student achievement)

8. Ho: There was no statistically significant difference among the mean scores of teacher expectations of student achievement between males and females.

9. Ho: There was no interaction between the independent variables (student learning style preference and student attitude toward school) and the dependent variable (teacher expectations of student achievement).

10. Ho: There was no statistically significant difference among the mean scores of teacher expectations of student achievement among the three student attitudes of high, medium, or low attitudes toward school.

11. Ho: There was no interaction between the independent variables (student learning style preference and student age) on the dependent variable (teacher expectations of student achievement).

12. Ho: There was no statistically significant difference among the mean scores of teacher expectations of student achievement among the student age groups (12-14, 15-16, 17-18).

13. Ho: There was no interaction between the independent variables (student learning style preference and the student's family structure) on the dependent variable (teacher expectations of student achievement).

14. Ho: There was no statistically significant difference among the mean scores of teacher expectations of student

achievement among the student's family structures of both parents, single parent, or guardian other than a parent.

Analysis of Data

The design of this research project suggested the use of Multiple Regression for the analysis of the data for null hypotheses one, two, and three. The data from null hypotheses 4 through 14 were analyzed with the statistical procedure analysis of variance (ANOVA). Multiple regression and two-way ANOVA's were used to test null hypotheses written in the following manner:

Multiple Regression Null Hypotheses

Ho 1 : $R^2 = 0$ Ho 2 : $\beta_1 = \beta_2 = 0$

Analysis of Variance (ANOVA)

Two-Way Interaction Null Hypothesis	Main Effects Null Hypothesis
Ho: $\mu 11 - \mu 21 = \mu 12 - \mu 22$	Ho: $\mu 1 = \mu 2$

Multiple Regression

Multiple regression was selected to analyze the data to enable the researcher to identify those variables that related to teacher expectations of student achievement. Multiple

regression determines the collective and separate contribution of two or more independent variables to the variability of the dependent variable. R^2 tells the amount of variability of the dependent variable that was accounted for by a knowledge of the independent variables. By adding these independent variables to the model, the researcher was able to increase the knowledge of R^2, and to reduce the amount of error or unexplained variability of the dependent variable. The R^2 is a biased estimate of the correlation coefficient. The amount of bias is related to the sample size and the number of independent variables. When the predictions from the sample are applied to the population, the R^2 will be reduced (Ferguson, 1981). The degree of overestimation, or the amount of shrinkage, to be expected is related to the sample size and the number of independent variables. The Adjusted R^2 represents the amount of variance that can be accounted for from a knowledge of the independent variables after allowing for shrinkage.

The instruments were handscored and the data were transferred to summary sheets. Prior to input into the computer from these summary sheets, the data were rechecked for accuracy. As a result of the design of the research project and the type of data gathered, the researcher determined that the most appropriate statistic to be used in analyzing the data was multiple regression for Hypotheses one, two, and three and two-

factor ANOVA (analysis of variance) for the remaining hypotheses (Ferguson, 1981).

The Stat View 512+ program also provided the intercorrelations among the independent variables. The independent variables of match or mismatch of student and teacher learning style preference, actual student achievement, student gender, student age, student attitude toward school, student ethnicity, and students' family structure, were represented by X_1, X_2, X_3, X_4, X_5, X_6, and X_7 respectively.

ANOVA

Two-way analysis of variance was utilized to test for interaction and main effects between the independent variable of student learning style preference and the other independent variables of student ethnicity, student gender, student age, the student's family structure, and student attitude toward school on the dependent variable of teacher expectations of student achievement. This showed if the two independent variables under investigation interacted with each other on the dependent variable of teacher expectations of student achievement at a statistically significant level. The main effects for each of the independent variables was investigated to see if there was a statistically significant difference between the subgroups within each independent variable.

Precautions Taken for Accuracy

The data was tabulated prior to being input into a computer. The computer printout was compared to the original data by the researcher and another person to insure accuracy.

The statistical analysis of the data is presented in Chapter 4.

CHAPTER 4

ANALYSIS OF DATA

Introduction

The data from this study were analyzed to determine whether there was a relationship between the match or mismatch of learning style preference of students and teachers, actual student achievement, and teacher expectations of student achievement, as well as to determine the contribution of student age, student gender, student ethnicity, the student's family structure, and student attitude toward school to the formation of teacher expectations of student achievement.

This research project was conducted using ten different teachers from the Bristol Bay Borough School District and The Lake and Peninsula School District both of which are located on the Alaska Peninsula. There were 160 students from these two school districts who met the criteria for inclusion. For the purposes of reporting the data, each of the null hypothesis listed in Chapter 3 is presented followed by the statistical summary tables and a description of the results.

Statistical Hypotheses

Hypotheses 1, 2, and 3 were tested using multiple regression. Hypotheses 4 through 14 were tested using two-way ANOVA. There were multiple testings of Hypotheses 6 which tested the main effects of the mean scores of teacher expectations of student achievement among the learning style preferences. This was done because of the changes in the frequencies and mean scores of teacher expectations of student achievement when analyzed with the other independent variables. The null hypotheses were tested at the .10 level of significance.

Hypothesis 1: The R^2 between the dependent variable (teacher expectations of student achievement) and the independent variables (match or mismatch of student and teacher learning style preference, actual student achievement level, student gender, student age, student attitude toward school, student ethnicity, and the student's family structure) was 0.

Table 1 summarizes the Analysis of Variance (ANOVA) testing the significance of the R^2.

Table 1. ANOVA Table for Multiple Regression.

Source	df	F	p-value
Regression	7	10.288	.0001
Residual	149		
Total	156		
	R^2 = .326	Adj. R^2 = .294	

Test: At the .10 level of significance, Hypothesis 1 was rejected. The p-value was .0001.

Result: The R^2 (.326) between the dependent variable and the seven independent variables was significantly greater than zero. Thus, 32.6% of the variability in teacher expectations of student achievement can be accounted for from a knowledge of the seven independent variables. After allowing for shrinkage or an over estimation of R^2, the adjusted R^2 was .294. The results showed that there is a relationship between the seven independent variables and the dependent variable.

Hypotheses 2: The Beta weights associated with the independent variables were zero (i. e., $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0$).

Table 2 shows the Beta Coefficients for the independent variables of match or mismatch of student and teacher learning style preference, actual student achievement, student gender, student age, student attitude toward school, student ethnicity, and the student's family structure.

Table 2. Beta Coefficients for the Seven Independent Variables.

Variable	Beta	t value	p-value
M/Mis S/T Learning Style	-.039	.558	.5774
Student Achievement	.472	6.663*	.0001
Student Gender	.008	.110	.9128
Student Age	-.024	.345	.7302
Student Attitude	-.030	.431	.6669
Student Ethnicity	-.202	2.796*	.0058
Family Structure	-.036	.508	.6122

*statistically significant

Test: Hypothesis 2 was rejected at the .10 level of significance. The p-value for actual student achievement was .0001 and the p-value for student ethnicity was .0058.

Results: The independent variables of actual student achievement and student ethnicity made a significant unique contribution to teacher expectations of student achievement when the other independent variables were taken into account.

Hypotheses 3: There was no intercorrelation among the independent variables of match or mismatch of student and teacher learning style preference, student gender, student age, student ethnicity, student attitude toward school, student's family structure, and actual student achievement as measured by end of semester grades.

Table 3 identifies each of the seven independent variables and the symbolic representation that was utilized in Table 4.

Table 4 depicts the intercorrelations among the independent variables that were used in this study.

Table 3. Symbolic Representation of Independent Variables

Independent Variables	Symbol
Match/Mismatch S/T Learning Style	X_1
Actual Student Achievement	X_2
Student Gender	X_3
Student Age	X_4
Student Attitude Toward School	X_5
Student Ethnicity	X_6
Students' Family Structure	X_7

Table 4. Intercorrelations Among the Independent Variables.

Variables	X_1	X_2	X_3	X_4	X_5	X_6	X_7
X_1							
X_2	-.001						
X_3	.208*	.048					
X_4	-.104	.021	.033				
X_5	.095	.038	-.074	.041			
X_6	-.061	-.300*	.052	-.105	-.140		
X_7	.061	-.097	.206*	-.185*	-.051	.154*	

*statistically significant

Test: At the .10 level of significance, Hypothesis 3 was rejected.

Result: Significant correlations were found between the following pairs of independent variables: match or mismatch of student and teacher learning style preference and student gender; actual student achievement and student ethnicity; student's family structure and student gender; student's family structure and student age; and student's family structure and student ethnicity.

More male students matched learning style preference with their teachers' learning style preference than did female students. Alaskan Native students had lower actual achievement levels than did Caucasian students. More male students lived in the traditional family structure with both parents present than did female students, while older students lived in less traditional family structures of one parent or neither parent than did younger students. Further, more Alaskan Native students lived in the less traditional family structures than did Caucasian students.

To determine to what degree each of the independent variables contributed to the variability of the dependent variable, a step-wise regression analysis was performed. In performing the step-wise regression the critical value of F to enter was 2.75, which produced two steps in the regression model. This indicated that two of the independent variables (actual student achievement and student ethnicity) provided a significant unique contribution to the prediction of the dependent

variable (teacher expectations of student achievement) after the other independent variables had been taken into account. The two variables account for 32.2 percent of the variability in the dependent variable.

Table 5 shows at what levels the two independent variables accounted for the variability of teacher expectations of student achievement.

Table 5. Independent Variables in the Step-Wise Regression.

Step	Variable	R^2	F to Enter
1	Actual Achievement	.287	46.892
2	Student Ethnicity	.322	8.022

Hypotheses 4, 5, and 6 examined the interaction and main effects of student learning style preference and student ethnicity.

Hypothesis 4: There was no interaction between the independent variables (student learning style preference and student ethnicity) on the dependent variable (teacher expectations of student achievement).

Hypothesis 5: There was no statistically significant difference between the mean scores of teacher expectations of student achievement of Caucasians and Alaska Natives.

Hypothesis 6: There was no statistically significant difference between the mean scores of teacher expectations of

student achievement among the Diverger, Converger, Accommodator and Assimilator student learning style preferences.

Table 6 shows the group and cell means of teacher expectations of student achievement for each of the learning style preferences of the ethnic groups. The ANOVA summary table is shown in Table 7.

Table 6. Group and Cell Means: Students of Caucasian and Alaskan Native Ethnic Groupings.

	Caucasian	Alaskan Native	Group
Diverger	4.000	3.656	3.750
Converger	4.565	3.667	4.211
Accommodator	4.267	3.444	3.958
Assimilator	4.353	3.853	4.020
Totals	4.343	3.711	3.981

Table 7. ANOVA for Student Learning Style Preference and Student Ethnicity.

Source	df	F	p-value
Student Learning Style	3	1.080	.3595
Ethnicity	1	17.592	.0001*
Interaction	3	.772	.5116
Residual	149		

*statistically significant

Test: At the .10 level of significance, Hypotheses 4 and 6 were retained. Hypothesis 5 was rejected.

Results: There was no interaction between student learning style preference and ethnicity on teacher expectations of student achievement. There was a statistically significant difference of teacher expectations of student achievement of Caucasian and Alaskan Native groups. The mean score difference between the Caucasian group and the Alaskan Native group was .632. This was based on a five-point scale. The Caucasian mean was significantly higher than the Alaskan Native Group. There was no statistically significant difference in teacher expectations of student achievement of the learning style preferences.

Hypotheses 7, 8, and 6 analyzed the interaction and main effects of student learning style preference and student gender.

Hypothesis 7: There was no interaction between the independent variables (student learning style preference and student gender) on the dependent variable (teacher expectations of student achievement).

Hypothesis 8: There was no statistically significant difference among the mean scores of teacher expectations of student achievement between males and females.

Hypothesis 6: There was no statistically significant difference between the mean scores of teacher expectations of student achievement among the Diverger, Converger,

Accommodator, and Assimilator student learning style preferences.

Table 8 shows the group and cell means of teacher expectations of student achievement for male and female students. The ANOVA summary table is shown in Table 9.

Table 8. Group and Cell Means: Males and Females.

	Male	Female	Group
Diverger	3.739	3.762	3.750
Converger	4.333	4.059	4.211
Accommodator	4.286	3.889	4.000
Assimilator	3.875	4.143	3.981
Totals	3.988	3.961	3.975

Table 9. ANOVA for Student Learning Style Preference and Student Gender.

Source	df	F	p-value
Student Learning Style	3	1.670	.1758
Gender	1	.354	.5528
Interaction	3	.925	.4303
Residual	152		

Test: At the .10 level of significance, Hypotheses 7, 8, and 6 were retained.

Results: There was no interaction between student learning style preference and student gender on teacher

expectations of student achievement. There was no statistically significant difference in the mean scores of teacher expectations of student achievement between males and females. There was no statistically significant difference between the mean scores of teacher expectations of student achievement among the learning style preferences.

Hypotheses 9, 10, and 6 examined the interaction and main effects of student learning style preference and student attitude toward school.

Hypothesis 9: There was no interaction between the independent variables (student learning style preference and student attitude toward school) on the dependent variable (teacher expectations of student achievement).

Hypothesis 10: There was no statistically significant difference among the mean scores of teacher expectations of student achievement among the three student attitudes of high, medium, or low attitudes toward school.

Hypothesis 6: There was no statistically significant difference between the mean scores of teacher expectations of student achievement among the Diverger, Converger, Accommodator, and Assimilator student learning style preferences.

Table 10 shows the cell and group means of teacher expectations of student achievement among the three attitude

groups of high, medium, and low, and Table 11 is the ANOVA summary table.

Table 10. Group and Cell Means: High, Medium, and Low Attitudes Toward School.

	High	Medium	Low	Group
Diverger	3.750	3.773	3.667	3.750
Converger	4.571	3.789	4.800	4.211
Accommodator	3.875	4.000	5.000	4.000
Assimilator	3.950	4.043	3.900	3.981
Totals	4.034	3.900	4.091	3.975

Table 11. ANOVA for Student Learning Style Preference and Student Attitudes of High, Medium, and Low.

Source	df	F	p-value
Student Learning Style	3	2.837	.0402*
School Attitude	2	1.225	.2968
Interaction	6	1.433	.2055
Residual	148		

*statistically significant

Test: At the .10 level of significance, Hypotheses 9 and 10 were retained. At the .10 level of significance, Hypothesis 6 was rejected.

Results: There was no interaction between student learning style preference and student attitude toward school.

There was no statistically significant difference of teacher expectations of student achievement among the three student attitudes of high, medium, or low. There was a statistically significant difference in the mean scores of teacher expectations of student achievement of Diverger, Converger, Accommodator, and Assimilator learning style preferences.

To further investigate the differences in the mean scores of teacher expectations of student achievement among the learning style preferences, the data were analyzed using the Newman-Keuls multiple comparison procedure. Table 12 shows the mean differences for each pair-wise comparison of learning style preference.

Table 12. Differences of the Student Range for the Newman-Keuls Multiple Comparison of Student Learning Style Preferences.

	Converger	Accomm...	Assimil...	Diverger
Converger	- - - -	.211	.230	.461
(Q)		(1.260)	(1.664)	(3.201)
Accommo...		- - - -	.019	.250
(Q)			(.120)	(1.535)
Assimil...			- - - -	.231
(Q)				(1.741)
Diverger				- - - -
(Q)				

Result: There was no statistically significant difference in the mean scores of teacher expectations of student achievement among the student learning style preferences.

Hypotheses 11, 12, and 6 tested the interaction and main effects of student learning style preference and student age.

Hypothesis 11: There was no interaction between the independent variables (student learning style preference and student age) on the dependent variable (teacher expectations of student achievement).

Hypothesis 12: There was no statistically significant difference among the mean scores of teacher expectations of student achievement among the student age groups (12-14, 15-16, 17-18).

Hypothesis 6: There was no statistically significant difference between the mean scores of teacher expectations of student achievement among the Diverger, Converger, Accommodator, and Assimilator student learning style preferences.

Table 13 depicts the group and cell means of teacher expectation of student achievement for each of the three age groups of high, medium, and low. The ANOVA summary table is shown in Table 14.

Table 13. Group and Cell Means: High, Medium, and Low Student Age Groups.

	High	Medium	Low	Group
Diverger	4.083	3.467	3.765	3.750
Converger	4.333	3.917	4.348	4.211
Accommodator	4.000	4.273	3.667	4.000
Assimilator	4.125	3.864	4.043	3.981
Totals	4.107	3.850	4.028	3.975

Table 14. ANOVA for Student Learning Style Preference and Student Age.

Source	df	F	p-value
Student Learning Style	3	1.072	.3631
Age	2	.592	.5546
Interaction	6	.847	.5357
Residual	148		

Test: Hypotheses 11, 12, and 6 were retained at the .10 level of significance.

Results: There was no interaction between student learning style preference and student age. There was no statistically significant difference of teacher expectations of student achievement among the age groups of high, medium, or low, and there was no statistically significant difference in teacher expectations of student achievement of the learning style preference groups.

Hypotheses 13, 14, and 6 examined the interaction and main effects of student learning style preference and the student's family structure.

Hypothesis 13: There was no interaction between the independent variables (student learning style preference and the student's family structure) on the dependent variable (teacher expectations of student achievement).

Hypothesis 14: There was no statistically significant difference among the mean scores of teacher expectations of student achievement among the student's family structures of both parents, single parent, or guardian other than a parent.

Hypothesis 6: There was no statistically significant difference between the mean scores of teacher expectations of student achievement among the Diverger, Converger, Accommodator, and Assimilator student learning style preferences.

Table 15 presents the group and cell means of teacher expectations of student achievement for the student's family structure groups of both parents, one parent, or no parent. Table 16 shows the ANOVA summary table.

Table 15. Group and Cell Means: Both Parents, One Parent, and No Parent.

	Both Parents	One Parent	No Parent	Group
Diverger	3.815	3.467	5.000	3.750
Converger	4.333	4.091	3.667	4.211
Accommodator	3.929	4.167	4.000	4.000
Assimilator	4.111	3.750	3.000	3.981
Totals	4.059	3.792	4.000	3.975

Table 16. ANOVA for Student Learning Style Preference and the Student's Family Structure.

Source	df	F	p-value
Student Learning Style	3	.535	.6591
Student's Family Structure	2	.558	.5736
Interaction	6	1.261	.2791
Residual	148		

Test: Hypothesis 13, 14, and 6 were retained at the .10 level of significance.

Results: There was no interaction between the independent variables of student learning style preference and the family structure of the student on the dependent variable of teacher expectations of student achievement. There was no statistically significant difference in the mean scores of teacher expectations of student achievement among the student's family structures of both parents, one parent, or no parent. There was

no statistically significant difference in the mean scores of teacher expectations of student achievement among the learning style preference groups.

A summary of this research project and conclusions drawn from an analysis of the data are presented in Chapter 5. Also included in Chapter 5 are recommendations for education and recommendations for further study.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This chapter summarizes this study and presents conclusions that were drawn from an analysis of the data gathered during the study. Recommendations for education and for further research are also presented in this chapter.

Summary

The researcher developed and conducted this study to determine whether there was a relationship between the match or mismatch of learning style preference of students and teachers, actual student achievement, and teacher expectations of student achievement. An additional component of this study was to determine the contribution made by student age, student gender, student ethnicity, the student's family structure, and student attitude toward school to the formation of teacher expectations of student achievement. This study was conducted

during the first semester of the 1987-88 school year in two school sites located on the Alaska Peninsula. The population consisted of 10 teachers and 160 students.

Teachers identified the expected levels of achievement they anticipated from students, grade seven through twelve, who were enrolled in the teacher's classroom for the first time. Expected achievement levels were rated on a five-point scale with five (5) being high and one (1) being low. This information was gathered through the use of an information sheet provided by the researcher (Appendix B). Teachers completed Kolb's (1985) Learning Style Inventory to determine the teacher's learning style preference.

Students completed the same Learning Style Inventory to determine the student's learning style preference. Student attitude toward school was assessed through The Quality of School Life Scale instrument (Epstein and McPartland, 1978). Demographic information of student gender, student age, student ethnicity, and the student's family structure was obtained from an information sheet completed by the students. The information sheet was provided by the researcher (Appendix A). Actual levels of student achievement were measured by the end of first semester grades for each student.

Student and teacher learning style preferences were categorized as: Diverger, Converger, Accommodator, or Assimilator. Through comparison, it was determined if a match

or mismatch of learning style preference existed for each of the teachers and individual students. From a conversion table based on grade level that accompanied The Quality of School Life Scale instrument, student attitude toward school was generated as high, medium, or low. Students were asked to identify their ethnic background with all but three indicating either Caucasian or Alaskan Native. Because of the small number that were outside of these two groups, those three were dropped from the statistical analysis of student ethnicity. Students identified their family structure as living with both parents, one parent, or some other structure. Student age was grouped into three categories. The first or low group was composed of students aged 12 through 14 at the time of the study. The second or medium group was made up of those students aged 15 through 16. The third or high group consisted of students aged 17 through 18. Student gender was either male or female.

The data were compiled on summary sheets for each student prior to being entered into the computer. The statistical package, StatView 512+ was utilized to analyze the data. This program allowed the data to be entered into a data base, which facilitated the process of checking for accurate data entry and analysis of the data. The design of the study and the type of data suggested that the data be analyzed through the statistical procedures of multiple regression and analysis of variance (ANOVA).

The statistical hypotheses were tested at the .10 level of significance to reduce the chance of committing a Type II error. Hypotheses one, two, and three were analyzed utilizing multiple regression with hypotheses four through fourteen being analyzed using analysis of variance. There were multiple analysis of hypothesis six, which addressed the main effects of student learning style preference, because of the changes in the frequencies and mean scores of teacher expectations of student achievement when analyzed with each of the other independent variables.

Hypotheses one was rejected which indicated that there was a relationship between the dependent variable and the independent variables. Through analysis, 32.6 percent of the variance of teacher expectations of student achievement was accounted for from a knowledge of the independent variables. Using the statistical process of step-wise regression, it was determined that actual student achievement and student ethnicity accounted for 32.2 percent of the variability of teacher expectations of student achievement. The Beta weights associated with the independent variables were not equal to zero. Actual student achievement and student ethnicity made a significant unique contribution to teacher expectations of student achievement when the other independent variables were taken into account. Therefore, hypothesis two was rejected. Significant correlations were found between the independent

variables of: match or mismatch of student and teacher learning style preference and student gender; actual student achievement and student ethnicity; student's family structure and student gender; student's family structure and student age; and student's family structure and student ethnicity. Hypothesis three was rejected.

Hypothesis five, which dealt with the differences between the mean scores of teacher expectations of student achievement of the ethnic groups, was rejected. Hypothesis six, which referred to the differences in mean scores of teacher expectations of student achievement, was rejected when it was analyzed with student learning style preference and student attitude toward school. However, hypothesis six was retained when student learning style preference was analyzed with student ethnicity, student gender, student age, and student's family structure. Hypotheses four, seven, nine, eleven, and thirteen, which stated that there was no interaction between student learning style preference and the other independent variables of student ethnicity, student gender, student attitude toward school, student age, and the student's family structure, respectfully, on teacher expectations of student achievement, were retained at a statistically significant level.

Hypotheses eight, ten, and twelve, which examined the main effects of student gender, student attitude toward school,

and student age on teacher expectations of student achievement, respectively, were retained at a statistically significant level.

Conclusions

Based on the analysis of data and information gathered during the course of this research project, the researcher reached the following conclusions:

1. Actual student achievement and student ethnicity did contribute to teacher expectations of student achievement.
2. Student learning style preference did not make a difference in the expected levels of achievement that teachers held for students. This does not support the positions of Gregorc (1984), Smith and Renzulli (1984), and Bargar and Hoover (1984). More male students matched learning style preferences with their teachers than did female students.
3. Expectations for student achievement for Alaskan Native students were lower than for Caucasian students. Actual student achievement levels were lower for Alaskan Native students than for Caucasian students. This concept has been supported throughout the literature, specifically in Dusek and Joseph's (1983) meta-analysis of research on teacher expectations.
4. Gender did not contribute to teacher expectations of student achievement at a statistically significant level. One reason for this might be that there has been considerable

emphasis recently to make teachers aware of role identification by gender. This has been done through Title IX as well as the evaluation of textbooks for sexually-biased representations of role for each gender. There has been considerable effort to portray both males and females in a wide variety of roles.

5. Student attitude toward school did not appear to affect the expectation levels that teachers held for their students. This would seem to refute the contentions of Brophy's (1983) self-fulfilling prophecy. However, where students' actual achievement levels contributed to teacher expectations, there is the possibility that this effect had already occurred at lower grade levels and students were achieving at what they perceived were teachers' expectancy levels.

6. Teachers do not hold lower expectations for students living in a one-parent family structure. There was a relationship between student's family structure and student gender, student's family structure and student age, and student's family structure and student ethnicity. More male students resided in family structures with both parents present than did female students, as did younger students. Native Alaskan students were more likely to live in a less traditional family structure of one parent or neither parent than were Caucasian students.

Dusek and Joseph (1983) suggested that the non-academic information of student's family structure could have an effect on the expectations of teachers. The trend in our present society seems to be a greater number of non-traditional family structures. This should not affect the levels of expectations that teachers hold for students. Brophy (1986) suggested that teachers should hold and communicate equally high expectations for all students.

7. The results of this study showed that teachers do not expect higher levels of achievement for students of different ages. There is nothing in the literature that either supports or refutes the lower teacher expectation levels for different student age groups.

Recommendations

Based on the data from this research project and the review of literature, the researcher makes the following recommendations for education as well as recommendations for further research:

Recommendations for Education

1. Inservice training of teachers needs to be done in the area of expectancy levels for students from different ethnic groups. The communication of expectancy levels from the teacher to the student has been shown to be a part of an

effective school. This should not be attempted in a one session presentation. Information presented utilizing this format too many times is heard and quickly forgotten and no real attitude or behavior changes take place. Although the information could be presented to the teaching staff in a one- or two-day session, there would need to be continual support and encouragement from the administration throughout the school year to see that the behaviors and attitudes of the teaching staff are indeed being changed in a positive manner. Here again an attempt to make these changes cannot be done one year and then forgotten after the school year is over. There needs to be a continuous awareness of the potential impact that teacher expectations of student achievement can have, not just for students from a different ethnic background, but for all students.

Therefore, as attempts are made to move schools closer to the effective school's model, the importance of expectation levels for students can't be stressed strongly enough. Teachers should not consider the ethnic background of students, either in the formation of expected levels of achievement or in the communication of those expectations to students. Educators should hold equally high expectation levels for all students, regardless of their ethnic background.

2. Students enrolled in teacher training programs need to be provided research information regarding the formation of

expectation levels of student achievement, specifically as expectation levels relate to students of different ethnic backgrounds. This information should be accompanied by instruction in communication of high or positive expectations to all students as well as instructional methods that will meet the needs of individual students. This information should be a part of the objectives for effective teaching and should be emphasized throughout the teacher training program.

3. Based upon the review of literature, a variety of teaching methods could help the overall achievement levels of individual students as education attempts to maximize the learning potential of students. Teachers also need to assist students in acquiring the skills of information processing that will enable students to feel more comfortable in situations where information is presented in a manner other than the student's preferred style. The more balanced the methods of acquiring and processing information the student possesses, the more successful the student will be in all learning environments.

Recommendations for Further Research

1. This research study should be replicated as closely as possible with a different population, possibly with a more urban population than in Alaska.

2. The literature suggested that the learning style preference of Native students changes as the student moves from a more culturally traditional Native life style to a more "Americanized" life style. The learning process which takes place within the framework of the traditional life style has tended to stress the importance of different learning styles than does the modern American life style. This study should be replicated with the addition of this component.
3. Further research should be conducted to determine what role, if any, subject matter would have upon both the learning style preference for student and teacher and the expectation levels of the teacher. This should include both the major area of preparation for the teacher as well as the subject being taught in the classroom.
4. There needs to be further investigation into the different methods of instruction and how they relate to the various learning style preferences. This could be done by examining the instructional methods most preferred by students and comparing this to their learning style preference.

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APPENDICES

APPENDIX A

STUDENT INFORMATION SHEET

STUDENT INFORMATION SHEET

NAME _____ AGE _____

Please circle the answer that best describes you:

GRADE: 7 8 9 10 11 12 GENDER: Male Female

ETHNICITY: Aleut Eskimo
Black Indian
Caucasian Other _____(Please specify)

Check the answer that best describes you:

FAMILY STRUCTURE:

_____ living with both parents

_____ living with mother

_____ living with father

_____ living with another family member
(please specify) _____

_____ living with someone other than a family member
(please specify) _____

APPENDIX B

TEACHER EXPECTATIONS SHEET

TEACHER EXPECTATIONS SHEET

NAME _____

Expectations for student Achievement

High				Low	Student's Name
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
5	4	3	2	1	_____
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