An investigation of interrelationships among mastery learning, climate, and expectancy motivation
by Anne Kruse Olson

A thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Education
Montana State University
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Abstract:
The problem of this study was to determine the interrelationships among attitude towards mastery learning, climate, and expectancy motivation among Montana elementary school teachers. Climate was studied in terms of principal-teacher, teacher-teacher, and teacher-student relations. Five multiple regression equations were used to analyze the interrelationships. Stepwise regression was used to build the most efficient model for each of the dependent variables. Hosier's double cross validation was used to test each of the models.

The study was conducted in the fall of 1987. The staffs of 27 Montana elementary schools were asked to complete the following instruments: Attitude Towards Mastery Learning Survey (ATML), Organizational Climate Description Questionnaire (OCDQ), Pupil Control Index (PCI), and Expectancy Motivation. Individual responses were analyzed for interrelationships.

Teachers who were positive towards mastery learning were more humanistic in pupil control orientation, more intrinsically motivated, and more positive in taking direction from the principal than teachers who were not as positive towards mastery learning. Teachers who perceived the climate more open as measured by the OCDQ, were more humanistic in their pupil control orientation, and more extrinsically motivated than those who perceived the climate as closed. Teachers who were more humanistic in their pupil control orientation scored positively on thrust (a measure of principal-teacher relations) , attitude towards mastery learning, lower on hindrance (a measure of principal-teacher relations) , and higher on extrinsic expectancy motivation. Teachers who were more intrinsically motivated also scored positively on attitude towards mastery learning. Teachers who were more extrinsically motivated perceived climate as more open than those teachers who were intrinsically motivated.

Each of the models was statistically significant at alpha = .05 when applying Hosier's technique of double cross validation except for the dependent variable of extrinsic expectancy motivation which had inconsistent results.

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by

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APPROVAL

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Anne Kruse Olson

This thesis has been read by each member of the thesis committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

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ABSTRACT

The problem of this study was to determine the interrelationships among attitude towards mastery learning, climate, and expectancy motivation among Montana elementary school teachers. Climate was studied in terms of principal-teacher, teacher-teacher, and teacher-student relations. Five multiple regression equations were used to analyze the interrelationships. Stepwise regression was used to build the most efficient model for each of the dependent variables. Mosier's double cross validation was used to test each of the models.

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Each of the models was statistically significant at alpha = .05 when applying Mosier's technique of double cross validation except for the dependent variable of extrinsic expectancy motivation which had inconsistent results.

CHAPTER 1

INTRODUCTION

Introduction

The effective school research base identifies practices and characteristics that are associated with measureable improvements in student achievement and excellence in student behavior. Effective schooling practices include elements associated with: 1) strong instructional leadership, 2) positive interactions between teachers and students, and 3) teachers who continually strive to improve instructional effectiveness (Northwest Regional Educational Laboratory, 1986).

Some schools have introduced instructional strategies through inservice programs in order to become more effective. One such strategy, mastery learning, has been implemented in schools as a means to improve instruction. Mastery learning shares many of the elements of the effective school research including: 1) positive interactions between the teacher and students (Guskey, 1985a), and 2) teachers who are open to change to improve instructional effectiveness (Guskey, 1985b). This suggests that there might be a relationship among the selected

elements of climate and expectancy motivation from the effective school research and mastery learning.

Mastery Learning

The research on mastery learning showed positive changes in student achievement for various students throughout the range of different grade levels and subjects (Block & Burns, 1976; Chandler, 1982; Guskey & Gates, 1986). Student attitudes were also shown to be more positive for the mastery students than for the nonmastery students although the research is not as extensive as in the student achievement studies (Block & Burns, 1976; Guskey & Gates, 1986).

The teacher variable in mastery learning is the focus of continuing research. Okey (1977) concluded that teachers who were trained in mastery learning techniques exhibited improved attitude towards the roles of testing, grading, and diagnosis in their teaching. In a study conducted by Guskey in 1982, teachers who received training in mastery learning experienced a change in their expectations of students. These teachers expected more students to achieve than before the mastery training.

Guskey (1984) studied the teacher variable in mastery learning. His sample consisted of 117 volunteer intermediate and high school teachers who were receiving training in mastery learning. Those teachers whose

students experienced a growth in achievement through the implementation of the mastery learning techniques expressed an increase in their responsibility for student learning and an increase in their affect toward teaching.

The latest study by Guskey (1987c) tied the research on effective teacher attitudes in effective schools to the practices of mastery learning teachers. Effective teachers believe that they can help all students, and they are positive in their feelings about teaching (Berman & McLaughlin, 1977; Brandt, 1986). Teachers who were categorized as effective tended to rate mastery learning as important, congruent with present teaching practices, and easier to implement than did their less effective colleagues.

Climate

Synonyms for climate include atmosphere, feel, tone, culture, or setting. Halpin (1966) wrote of the "personality" of each school. Climate in a school can be thought of as the qualities of the school which affect how people feel and learn. Anderson, (1982, p. 368) wrote that "school climate research is clearly the stepchild of both organizational climate research and school effects research." Gilmer (1966, p. 57) described organizational climate as

> . . . those characteristics that distinguish the
> organization from other organizations and that
> influence the behavior of people in the
> organization. It is, in effect, what we react
> to. . . .

School climate is difficult to conceptualize and

measure. Argyris (1958) concluded that school climate,

like other constructs of human behavior, involves ordering

and conceptualizing mutually interacting variables.

Tagiuri (1968, p. 22) wrote that organizational climate is

> . . . a relatively enduring quality of the
> internal environment of an organization that 1)
> is experienced by its members, 2) influences
> their behavior, and 3) can be described in terms
> of values of a particular set of characteristics
> (or attributes) of the organization.

Most measures of school climate focus on particular aspects

of the organization and only some of the dimensions are

delineated by any given instrument. This study considered

three dimensions: principal-teacher relations,

teacher-teacher relations, and teacher-student relations.

Expectancy Motivation

Teacher expectation for student achievement is gaining

support as an important factor in the motivation for high

achievement. Anderson (1982) reported that the level of

expectation teachers and administrators hold for each

other, and especially for students, is the attitude most

frequently associated with climate and student outcomes.

Anderson concluded that staff in high achieving schools

consistently "manifest attitudes of confidence that
students will be able to succeed academically" (1982, p.
403).

The work of Rosenthal and Jacobson (1968) brought
attention to the idea that a positive relationship exists
between teacher expectations and student achievement.
Their work was criticized on methodology and the lack of a
theoretical foundation. Since then, however, the effective
school research has found a number of studies that conclude
that expectacy affects student achievement (Braun, 1976;
Brookover & Lezotte, 1979; Brophy & Evertson, 1976; Dusek,
1975; Edmonds & Frederiksen, 1978; Good, 1979; MacKenzie,
1983; Phi Delta Kappa, 1980; Rosenshine, 1983).

Vroom's (1964) work on expectancy theory provided the
model for Miskel, Bloom, and McDonald (1981) in the
development of their instrument for measuring teacher
expectancy motivation within schools. Vroom (1964)
described expectancy, valence, and instrumentality as
essential concepts in motivation. Expectancy is the belief
that an individual's own efforts will lead to successful
performance. Valence is the degree of desirability or
attractiveness that an individual attaches to a reward.
High valence means that the reward is attractive to the
individual. Rewards such as satisfaction for task
achievement (high student performance) and esteem from

students are rewards that conceivably hold high valence for teachers. Corbett (1982, p. 191) stated, "Because of teacher isolation, students have been shown to be particularly important sources of incentives for teachers." Instrumentality is the belief that a given performance will lead to attaining the rewards (Vroom, 1964; Hoy & Miskel, 1982). Vroom's model is that the propensity to start and maintain behavior is the product of expectancy, valence, and instrumentality.

The following is an example of the model. A teacher will have a strong force of motivation to pursue improved instruction if the teacher: (1) believes that a strong personal effort will positively influence student achievement, (2) feels personally rewarded by good performance on the part of the students, and (3) believes that he/she is capable of the instructional performance required to produce the desired level of student achievement (Mulhern, 1984). Other studies have confirmed that when people believe events are beyond their control, regardless of their level of effort, their effort persistence declines and anxiety increases (Thornton & Jacobs, 1971; Klein & Seligman, 1976).

This concept of motivation to pursue an objective was described by Miskel et al. (1981) as expectancy motivation. Their selection of items to portray expectancy focused on

the attainment of educational objectives on student achievement.

Mulhern (1984), in a study of New Jersey high schools, found that schools with more open climates appeared to have teachers who had a higher expectancy motivation (p <.0006). He also found that secondary teachers with a more humanistic pupil control ideology had a higher expectancy motivation (p <.0006).

Problem Statement

The problem of this study was to determine the interrelationships among elementary teachers' attitude towards mastery learning and selected elements of effective school practices.

The selected effective school elements included climate and expectancy motivation. Climate was studied in terms of teacher-principal relations, teacher-teacher relations, and teacher-student relations.

Need for the Study

In reviewing literature on outcome-based instruction, Spady (1981) noted that no research was cited in the area of mastery learning and climate and that research was needed. Guskey and Gates (1986), in a meta-analysis of mastery learning research from 1976-1986, concluded that

more studies were needed on classroom climate, teacher-student interactions, and the changing teacher role from that of judge to a learning facilitator who works for student successes. Oslund (1985) concurred with Guskey and Gates by suggesting more studies on the relationship between student successes and the changes in teachers' attitudes and beliefs. This study adds to the knowledge base on the interrelationships among mastery learning and the effective school research elements of climate and expectancy motivation.

Mann (1978, p. 3) stated that "more than ever, those who seek to change schools must change teachers while they are working in the schools." Rogers and Shoemaker (1971, p. 11) wrote that "the aggregation of a multitude of individual changes produces a system-level alteration." The implementation strategy of the mastery learning training utilized in this study was to train volunteer classroom teachers in order to establish a critical mass of teachers skilled in mastery learning techniques who would then train other teachers. If one accepts the assumptions that teachers are the unit of change and that individual change can produce a system level change, then the training of teachers in mastery learning could create a critical mass of teachers that would produce a system-level change. This study helps to establish a link between implementation

of teacher training in mastery learning and the selected elements of effective schools.

The studies on the teacher effects from mastery learning have been done immediately after initial training or after a half-day staff development program. None of the studies done by Okey (1977) or Guskey (1982, 1984, 1985b, 1987c) included teachers who had implemented mastery learning strategies for periods of more than one year. Thus, this study adds to the research on the effects of mastery learning training of more than one year rather than a one time initial exposure to the teaching strategy.

General Questions to Be Answered

The following general questions were addressed:

1) How much of the variability of attitude toward mastery learning can be accounted for by principal-teacher and teacher-teacher relations, teacher-student relations, and intrinsic and extrinsic expectancy motivation? How much does each of the variables of principal-teacher and teacher-teacher relations, teacher-student relations, and intrinsic and extrinsic expectancy motivation contribute individually to the variance of attitude towards mastery learning? What is the most efficient way to explain the variability of attitude toward mastery learning?

2) How much of the variablility of principal-teacher and teacher-teacher relations can be accounted for by measures of teacher-student relations, intrinsic and extrinsic expectancy motivation, and attitude towards mastery learning? How much does each of the variables of teacher-student relations, intrinsic and extrinsic expectancy motivation, and attitude toward mastery learning contribute individually to the variance of principal-teacher and teacher-teacher relations? What is the most efficient way to explain the variability of principal-teacher and teacher-teacher relations?

3) How much of the variablility of the teacher-student relations can be accounted for by intrinsic and extrinsic expectancy motivation, attitude toward mastery learning, and principal-teacher and teacher-teacher relations? How much does each of the variables of intrinsic and extrinsic expectancy motivation, attitude toward mastery learning, and principal-teacher and teacher-teacher relations contribute individually to the variance of teacher-student relations? What is the most efficient way to explain the variability of teacher-teacher relations?

4) How much of the variability of intrinsic expectancy motivation can be accounted for by attitude toward mastery learning, principal-teacher and

teacher-teacher relations, and teacher-student relations? How much does each of the variables of attitude toward mastery learning, principal-teacher and teacher-teacher relations, and teacher-student relations contribute individually to the variance of intrinsic expectancy motivation? What is the most efficient way to explain the variability of intrinsic expectancy motivation?

5) How much of the variability of extrinsic expectancy motivation can be accounted for by measures of attitude toward mastery learning, principal-teacher and teacher-teacher relations, and teacher-student relations? How much does each of the variables of attitude toward mastery learning, principal-teacher and teacher-teacher relations, and teacher-student relations contribute individually to the variance of extrinsic expectancy motivation? What is the most efficient way to explain the variability of extrinsic expectancy motivation?

General Procedures

The study was conducted in five school districts in Montana. The districts were selected on two criteria: 1) the district must have offered a five credit extension class from Montana State University (MSU) on mastery learning to their elementary teachers, and 2) the

superintendent of the district had to grant permission for the district to participate in the study.

Teachers who participated in the extension class had been given guided practice, individualized and small group instruction, and feedback in the implementation of mastery learning for a school year. The teachers who were trained in mastery learning were assigned to implement the teaching strategy in one class for the year.

The researcher traveled to each of the school districts to obtain permission from the superintendents to meet with principals and conduct the research. Faculty meetings, or in some schools at the discretion of the principal, small group meetings, were used to distribute and collect the completed instruments during the last week of September and the first two weeks of October, 1987. Assistants distributed the data collection instruments as teachers entered the room. The data collection instrument was a booklet comprised of the Attitude Towards Mastery Learning (ATML), Organizational Climate Description Questionnaire (OCDQ), Pupil Control Index (PCI), and Expectancy Motivation instruments. The instruments were collected after the meeting. To the extent possible, data were obtained from all teachers in the selected schools. A sample of 400 was sought. Individual results were confidential.

Data were checked for accuracy from the computer printout before analysis. Five multiple regression equations were analyzed. Each of the five variables was analyzed as the dependent variable. If significant relationships were found, Moser double cross validation techniques were used to strengthen the interpretation. A stepwise regression was utilized to determine which variables account for the variation in the dependent variable.

Limitations and Delimitations

The limitation of the study was that the only curricular change considered was the implementation of mastery learning.

The following were the delimitations of the study:

1) The study was conducted during the 1987-1988 school year.

2) School districts had to have mastery learning paradigm implementation for at least one academic year.

Definition of Terms

Inservice education was defined as "all activities carried out by the district or school to promote staff growth and renewal" (Rogus, 1983, p. 9).

Mastery learning was defined as a teaching-learning paradigm in which material is divided into units of one to two weeks in length. Formative tasks were utilized to assess and diagnose student progress. Feedback and correctives were designed from the formative tests. Summative tasks were used for grading purposes (Guskey, 1985a).

The attitude towards mastery learning was measured by the Attitude Towards Mastery Learning (ATML), an instrument of 32 items regarding a teacher's attitude towards mastery learning (see Appendix A). Attitude Toward Mastery Learning is the original ATML by Okey (1977) with one additional item on summative testing as recommended by Casagranda (1987).

Organizational climate was "the set of internal characteristics that distinguish one school from another and influences the behavior of people in it" (Hoy & Miskel, 1982, p. 185). It was measured by the Organizational Climate Description Questionnaire (OCDQ). The OCDQ measured eight dimensions of school climate which can be divided into two subtests: one subtest for teacher-teacher relations, and one subtest for principal-teacher relations. (The OCDQ instrument is in Appendix B.)

The openness index score (OPEN) is derived from the subscale scores from the OCDQ. OPEN is equal to the sum of thrust and esprit scores minus the disengagement score.

Pupil control was defined as how school staff view the students or, more precisely, the dominant pattern that teachers and principals use to control students. The Pupil-Control Ideology (PCI) was used to measure pupil control. (See Appendix C.)

Teacher-student relations was defined as the interactions between the teacher and the students and was measured by the PCI in terms of a teacher's orientation toward humanistic or custodial control of students.

Principal-teacher relations was defined as the interaction between the principal and the teachers of that school. It was measured by the subscale of the OCDQ which includes the subtests of production emphasis, aloofness, consideration, and thrust.

Teacher-teacher relations was defined as the interactions among the faculty of a school and was measured by a subscale of the OCDQ which includes the subtests of hindrance, intimacy, disengagement, and esprit.

Expectancy motivation was defined as the motivation to pursue educational objectives on student achievement. The operational definition of expectancy motivation was the product of expectancy, instrumentality, and valence as

measured by the Expectancy Motivation Instrument (see Appendix D).

Intrinsic expectancy motivation (EMII) is from within the individual. An example is an individual's belief that one has used one's abilities to the fullest.

Extrinsic expectancy motivation (EMIE) is tied to the rewards from the organization, such as recognition or money. The distinction between intrinsic and extrinsic expectancy motivation is meant to differentiate between the rewards that are under the direct control of the individual and those that are not.

CHAPTER 2

REVIEW OF LITERATURE

Introduction

The review of literature concentrates on the research in the following major areas: 1) mastery learning, 2) climate, and 3) expectancy motivation. Background for each of these topics is necessary before one can consider the interrelationships among them.

Mastery Learning

Development

Underlying mastery learning is an explicit philosophy about learning and teaching (Block & Anderson, 1975). This philosophy asserts that under appropriate instructional conditions virtually all students can learn well, that is "master" most of what they are taught. Mastery learning proposes that teachers can teach so that all students do learn well (Block & Burns, 1976).

The philosophy that all can learn and learn well has historical roots in the works of Comenius, Pestalozzi, Herbart and contemporary figures such as Washburne and Morrison (Torshen, 1977). Cronbach (1972) found the same

idea in the writings of the English Enlightenment philosopher John Locke.

Torshen (1977) noted that the foundation for mastery learning was laid by J. Franklin Bobbit, Ralph Tyler, Robert Meager, and others beginning in the 1960s with their ideas on teaching to performance objectives and improving instruction in the classroom. Carroll (1963, p. 727) put forth the idea that aptitude was a function of time and that schools might not allow adequate time for students to learn a task when he stated:

> It may come as a surprise to some to be told that the school may allow less than adequate time for learning any task, but second thought will make one realize that this is very often the case.

Carroll (1963) advocated that all schools look at aptitude as a function of time. Carroll proposed that if each student was allowed the time needed to learn the subject to some criterion level, and if the student spent the necessary time to do this, then the student would attain that level. In summary, Carroll's model stated that the degree of learning of a given subject depended on the student's opportunity to learn, relative to his aptitude for the subject, the quality of the instruction and the student's ability to understand the instruction (Block & Burns, 1976). With time as a variable rather than a constant, more students would accomplish a task. The

school should give all students an opportunity to learn (time), and students should receive quality instruction.

In 1968, Bloom built on Carroll's ideas and knowledge about one-to-one tutoring. Bloom focused on the variables that the teacher could control, the opportunity to learn and the quality of instruction. Bloom concluded that if each student received differential opportunity to learn and differential quality of instruction, then as many as 95 percent of the students could attain mastery and the individual differences in student aptitude would have little bearing on the students' achievement (Block & Burns, 1976). In his book, Human Characteristics and School Learning, Bloom (1976, p. 212) described the major thesis of his Learning for Mastery model as:

> A system of feedback to the teacher and student can reveal errors in learning shortly after they occur, and if appropriate corrections are introduced as they are needed, the educational system can be a self-correcting system so that errors made at one time can be corrected before they are compounded with later errors.

There have been additions and modifications to Bloom's model. Guskey (1987b) summarized the essential characteristics of mastery learning as feedback and correctives, and congruence among the instructional components. In the teaching and learning process, there are four major components: 1) learning objectives, 2) instruction, 3) feedback and correctives, and

4) competent learners. The feedback is essential in that it must be both diagnostic and prescriptive for what needs to be learned. The correctives must approach learning in a way different from the initial instruction. The students must participate in the correctives in order to be directly involved in the learning. Enrichment activities are used to broaden and expand the learning if mastery was obtained from the initial instruction.

The congruence among the instructional components means that there must be agreement among the learning objectives, the instruction, and the testing of what has been learned. In other words, the test must match the basis for the learning, the learning objectives, and how these learning objectives were taught. If the learning objectives were taught on the knowledge level, then the test should be on the knowledge level.

Mastery Learning and Personalized
Systems of Instruction

Two instructional strategies have attempted to put into practice the philosophy that all students can learn. One of these practices, Bloom's (1968) Learning for Mastery (LFM), has been used primarily by elementary and secondary educators. The other practice, Keller's 1968 Personalized System of Instruction (PSI), evolved from the study of

psychology and has been utilized by college and university educators (Block & Burns, 1976).

The Personalized System of Instruction (PSI) model is an individually based, student-paced approach to instruction in which students usually learn independently of their classmates. The feedback is provided by people, usually student proctors. Typically, students work at their own pace and move on to new material when they demonstrate mastery of a unit. If they do not pass the unit test, the original instructional unit is repeated until mastery is demonstrated. The unit test can be retaken a number of times without penalty. Grading is usually based on the number of units completed.

The teacher's role in a PSI classroom is one of individual assistance. Occasional class presentations are used for motivation rather than sources of necessary information. Carefully designed, self-instructional materials are essential to a successful PSI program (Kulik, Kulik, & Cohen, 1979; Thompson, 1980).

The mastery learning model is typically a group-based, teacher-paced approach to instruction in which students usually learn with their classmates (Guskey, 1985a). The model can be adapted to an individually based, student-paced format. In the mastery learning classroom, the pace of the original instruction is set by the teacher.

The role of the teacher is that of a facilitator in the learning process (Guskey, 1985b). The teacher specifies the learning objectives for each unit which usually last two weeks or less. In addition, the teacher sets a criteria level for mastery, usually 80 percent. Nongraded formative tests are given during the unit to diagnose areas of weakness. If mastery is not achieved on the formative test, remediation with correctives that are different from the original instruction is used before a formative test is taken again. The formative tests are used to diagnose areas of weakness (feedback) and to prescribe correctives. Enrichment activities are used if mastery is achieved with the initial instruction. Grading is accomplished by the use of a summative test.

Effectiveness of Mastery Learning

In their 1976 summary of research on mastery learning, Block and Burns divided the studies into four types to answer the following questions: 1) Does mastery learning work? 2) If mastery learning works, what are the side effects for the students? 3) Do the different components of mastery learning affect students differently? and 4) How does mastery learning work?

Block and Burns, in addressing the effectiveness of mastery learning, concluded that mastery-taught students exhibited greater learning than their nonmastery-taught

counterparts. In 97 comparisons of average achievement test scores, comparisons involving various types and numbers of students and various subject matter areas, mastery-taught students scored higher than nonmastery-taught students 89 percent of the time, and significantly higher 61 percent of the time (p <.05). Average retention test scores in 27 comparisons showed the mastery-taught students scored significantly higher 63 percent of the time than the nonmastery-taught students (p <.05).

Block and Burns (1976) concluded that mastery learning strategies had a positive impact on students' interest in and attitudes toward the subject matter learned, self-concept (academic and more general), academic self-confidence, attitudes toward cooperative learning, and attitudes toward instruction. Some concern was expressed as to whether the favorable responses were attributable to the Hawthorne effect or were not permanent. The conclusion relative to student time cost was that mastery strategies might eventually help the slower student approach the learning rate of the faster student.

In examining the research on the different components of mastery learning, Block and Burns found that the unit mastery requirement consistently produced the strongest effects. Block and Burns hypothesized that the unit

requirement affected the quality and the quantity of student study time.

In 1982, Chandler found that of 97 studies comparing average achievement between mastery and nonmastery groups, 59 favored mastery. Three of the studies favored nonmastery and no statisticallly significant results were found for the remaining 35 studies. In another study, Chandler found that 48 of 61 groups indicated statistically significant average achievement results in favor of mastery-taught students. No study favored nonmastery. Chandler (1982, p. 10) concluded that "if a student is at the fiftieth percentile in the nonmastery group he could be expected to move to the eightieth percentile using a mastery approach."

Guskey and Gates (1986) used Glass meta-analysis techniques on all the mastery learning studies from 1975 through 1986. Twenty-seven studies were chosen based on the criteria of using Bloom's model, quantitative data, group-based/teacher paced instruction, and a good design. Guskey and Gates concluded that mastery learning increased student achievement and that there was a positive effect on student learning retention. This conclusion was based on the magnitude of the effect sizes computed in this meta-analysis. Only one study included measuring the affective domain; students liked the subject better.

Critics of Bloom's model said that it was too rigid and mechanistic (Groff, 1974; Jaynes, 1975). Other criticisms were that it was effective only with knowledge based information or simple skills (Cronbach, 1972), and that it did not work in the complex learning setting in schools (Bowen, 1975). Opponents also disputed the return on the amount of time needed for student remediation and planning of units (Arlin, 1984; Slavin 1987). Slavin (1987) distinguished time from mastery learning techniques and stated that the mastery learning technique in itself does not produce significant results, although Slavin (p. 52) concluded:

> The idea that students' specific learning deficits should be remediated immediately instead of being allowed to accumulate into large and general deficiencies makes a great deal of sense.

Proponents argued that the model is flexible and employs humanistic strategies (Levin, 1974), can be applied to complex skills (Levin, 1975), and that it can be applied in the classrooms (Block & Anderson, 1975). Numerous studies have supported the gains in achievement that resulted from mastery learning instruction (Arlin, 1984; Buckman & Brezin, 1981; Burns, 1979; Chandler, 1982; Covington & Omelick, 1984; Dillashaw & Okey, 1983; Guskey, 1982; Guskey & Gates, 1986; Okey, 1977; Wise & Okey, 1983).

Teacher Effects

In the review of mastery learning research done by
Block and Burns in 1976, the questions of mastery learning
implementation and mastery learning's effects on teachers
were also considered. Block and Burns concluded that both
inservice and preservice teachers could be trained to teach
for mastery and that learning how to teach for mastery does
not require the acquisition of a whole new set of skills.
Learning to teach for mastery required the addition of a
few new skills such as diagnostic testing to an "old"
skill, for example, remediation. Teachers could apply the
techniques in the classroom and were rewarded with gains in
their students' achievement, especially if they had prior
teaching experience.

In 1982, Guskey worked with a group of 44 volunteer
intermediate and high school level teachers from two school
systems. The teachers were trained in mastery learning
techniques. Thirty-four of the 44 teachers were
categorized as effective mastery learning teachers by two
criteria: 1) the percentage of their students who received
an A or a B, and 2) the average percent of correct
responses that their students scored on the common course
examination. Guskey concluded that as the teachers
experienced a positive change in their effectiveness as
measured by his two criteria, the relationship between

their initial expectations for performance and student achievement outcomes appeared to be reduced. That is, the teachers expected more students to achieve because of their teaching and more students did.

Guskey (1984) completed another study using a sample of 117 intermediate and high school teachers. He found that as teachers experienced a positive change in the learning outcomes of their students with mastery learning techniques, they expressed an increase in personal responsibility for student outcomes, and an increase in their positive feelings toward teaching. However, these mastery learning teachers also expressed a decrease in confidence in their teaching abilities. Guskey noted that this "humbling effect" correlated to a willingness to try new procedures and techniques. Guskey concluded that the teachers who utilized the mastery learning techniques realized that there was more to learn about teaching.

Guskey (1985b) continued to investigate teachers' effects from implementing mastery learning techniques. A questionnaire was designed to discern whether teachers explained their effectiveness more in terms of behavior or in terms of personality after implementing mastery learning. The questionnaire was scored on a continuum from "completely unimportant" (1) to "extremely important" (5). An example of a personality item as the reason for the

teacher's effectiveness stated, "Students find the teacher
very kind and likeable." An item that was an example of
the behavior as the reason for the teacher's effectiveness
stated, "The teacher's instructional materials are well
organized." The teachers who did not use mastery learning
attached more importance to personality factors as
characteristics responsible for effective teaching. These
personality factors were perceived as difficult to change.
The mastery learning teachers attached more importance to
behavior factors and believed that these could be changed
with training. Guskey concluded that teachers who used
mastery learning techniques were more open to change than
teachers who did not.

The meta-analysis of mastery learning studies done by
Guskey and Gates in 1986 reinforced these findings.
Teachers who used mastery learning were more open to
change, began to feel better about teaching, and felt
better in their roles as teachers. The mastery learning
teachers felt more personal responsibility for their
students' successes and failures, but less confident in
their teaching abilities.

Guskey (1987c) conducted a study to see if there was a
significant relationship between measures of teacher
efficacy, teaching affect, and teaching self-concept; and
teachers' attitudes regarding congruence, difficulty of

use, and importance of the recommeded practices. Guskey surveyed 120 elementary and secondary teachers after a one-half day staff development program on mastery learning instructional strategies. The teachers surveyed represented an urban district, a suburban district, and a rural district. Guskey found that neither grade level nor years of experience were significant. He concluded that the more efficacious teachers, as measured by the Rand Corporation Change Agent Study and the Responsibility for Student Achievement Instrument (RSA), did tend to rate mastery learning as more important, more congruent with present teaching practices, and easier to implement than did their less efficacious colleagues.

In a study completed by the Far West Educational Laboratories (Guskey, 1987a), mastery learning schools and nonmastery learning schools were compared on climate measures. No significant differences were found between the mastery and nonmastery schools. A critical variable in this study was the definition of mastery learning. The definition used was not adequate and did not address the remediation and feedback according to Guskey (1987a). A second variable was that climate was viewed on a school-wide basis instead of using the perceptions of individual teachers.

Climate

Concept

Synonyms for climate include atmosphere, feel, tone, culture, or setting. Halpin (1966) wrote of the "personality" of each school. Climate in a school can be thought of as "the qualities of the school which affect how people feel and learn" (Lawrence, 1983, p. 3). Nwanko (1979, p. 268) wrote of a "general 'we-feeling' group sub-culture or interactive life of the school." Anderson, (1982, p. 368) wrote that "school climate research is clearly the stepchild of both organizational climate research and school effects research."

Gilmer (1966, p. 57) described organizational climate as:

> . . . those characteristics that distinguish the organization from other organizations and that influence the behavior of people in the organization. It is, in effect, what we react to . . . .

Lewis (1983, p. 36) stated,

> Organizational climate is almost like a barometer, indicating how employees feel about specific managerial practices. Employees may feel relaxed, or driven, uptight, and under suspicion. The climate consists of the interpersonal and environmental factors that shape behavior and motivation.

Tagiuri (1968, p. 22) wrote that organizational climate is:

> . . . a relatively enduring quality of the internal environment of an organization that 1) is experienced by its members, 2) influences their behavior, and 3) can be described in terms of values of a particular set of characteristics (or attributes) of the organization.

Climate is difficult to conceptualize and measure. Argyris (1958) concluded that school climate, like other constructs of human behavior, involves ordering and conceptualizing mutually interacting variables. Most measures of school climate focus on particular aspects of the organization and only some of the dimensions are delineated by any given instrument.

Organizational Climate Description Questionnaire

The early work on organizational climate was carried out in business organizations rather than schools (Schneider & Barlett, 1968). Halpin and Croft (1962) were among the first to develop an organizational climate instrument for research in schools.

The Organizational Climate Description Questionnaire (OCDQ) designed by Halpin and Croft (1962) focuses on two dimensions: teacher-principal relations and teacher-teacher relations. The OCDQ is composed of eight subtests; four of the subtests refer to the characteristics of the faculty group, and four describe components of teacher-principal relations.

The subtest for the principal-teacher relations includes the subscales: 1) production emphasis, 2) aloofness, 3) consideration, and 4) thrust. An "open" school has a high degree of thrust with a principal perceived as leading by example with the proper mix of consideration to fit the situation. A "closed" school is one where the principal makes all the decisions, and rules are set by the principal and never questioned (Hoy & Miskel, 1982).

The subtest for teacher-teacher relations contains the subscales of: 1) hindrance, 2) intimacy, 3) disengagement, and 4) esprit. The "open" school has teachers who accomplish their work with vigor and pleasure. The "closed" school has a high level of teachers not focused on a common task.

Halpin and Croft (1962) relied on Halpin's work with leader behavior in organizations. The rationale for focusing on the principal and teacher relations and the leadership behavior was stated by Halpin and Croft (1962, pp. 10-11):

> In gathering material for the OCDQ items, one point struck us forcibly: that an essential determinant of a school's 'effectiveness' as an organization is the principal's ability, or his lack of ability, to create a 'climate' in which he, and other group members, can initiate and consummate acts of leadership. One of our guiding assumptions is that a 'desirable' Organizational Climate is one in which it is possible for leadership acts to emerge easily, from whatever source. If an organization is to accomplish its tasks, leadership acts must be

initiated. However, it should be noted that we
do not assume that leadership acts need be
confined exclusively to the designated leader,
himself. Such acts can be initiated either by
the leader or by members of the faculty. If the
leader fails to provide sufficient leadership
acts, and leadership acts of sufficient 'quality'
in that they are 'accepted' and that they also
lead to increased group 'effectiveness,' then
members of the group will seek to offer the
'leadership' required to make the group
'effective.' In this view we have been supported
by the central finding that pervades all research
on leadership and group behavior: an 'effective'
group must provide satisfaction to group members
in two major respects; it must give a sense of
task-accomplishment, and it must provide members
with the social satisfaction that comes from
being part of a group. This is simply a
paraphrase of Chester Barnard's insistence that a
group be both 'effective' and 'efficient.'
   Even when we first began our research, one
conclusion stood out forcibly: we would have to
include in the OCDQ measures of the leader's
behavior as well as measures of the group's
behavior. From these two sets of measures we
might then hope to identify which types of
behavior by the leader are 'associated' with
specific behaviors among the group members.

Hale (1966) found a correlation between the language

art scores from the California Achievement Test of

elementary school children with the scores of subtests of

the OCDQ. In 1968, Miller found that an overall open

climate, as measured by the eight subtests of the OCDQ,

related to pupil achievement in 29 elementary schools in an

urban school district.

However, the results on a correlation between open

climate and high achievement are inconsistent (Rice, 1968).

Hoy and Miskel (1982) wrote of the "cognitive fallacy."

In other words, an open climate will enhance a sound instructional program. If the instructional program is weak, an open climate cannot make a poor program good.

Studies that have examined the relationship between characteristics of the principal and climate have found that open schools, as compared to closed schools, have principals who are more confident, cheerful, sociable, and resourceful (Anderson, 1982). Teachers who work under principals in open schools express greater confidence in their own and the school's effectiveness (Andrews, 1965).

Research on student alienation found a correlation to the openness of a school's climate. A study of high schools by Hartley and Hoy (1972) found that the more open the school climate the less the sense of alienation by the students and professional personnel.

Pupil Control Ideology

The Pupil Control Ideology (PCI) focuses closely on teacher-student relations. Control is a problem that all organizations face (Carlson, 1964). Carlson's analysis of service organizations indicated that public schools are the type of service organizations where control is likely to be an acute problem. Pupil control is a central aspect of school life (Hoy & Miskel, 1982). The PCI instrument is a measure of how educators view the students on a continuum of humanistic to custodial on 20 items. A humanistic

orientation leads to a democratic atmosphere with open channels of two-way communication between pupils and teachers and increased student self-determination (Hoy & Miskel, 1982). The term "humanistic orientation" stresses the importance of the individual and the creation of an atmosphere that meets student needs. Teachers who have a custodial orientation conceive of the school as an autocratic organization with a rigid pupil-teacher status hierarchy. Teachers do not attempt to understand student behavior but view misbehavior as a personal affront. Impersonality, cynicism, and mistrust pervade the atmosphere of the custodial school (Hoy & Miskel, 1982).

The concepts of openness of climate and pupil control orientation seem to be highly compatible (Hoy & Miskel, 1982). In general, humanistic teachers are more likely than custodial teachers to: 1) work well together, 2) have high morale and are satisfied because of their sense of task accomplishment, 3) have principals who deal with teachers on an informal basis rather than strictly by the rules, 4) have principals who motivate by personal example, and 5) have a climate marked by openness, acceptance, and authenticity (Hoy & Miskel, 1982).

Mulhern's (1984) climate study of secondary teachers found that humanistic teachers had higher expectations for students than custodial teachers. Hoy and Appleberry

(1970), in a study of elementary schools, concluded that the humanistic pupil-control orientation and the openness of the organizational climate of the school are strongly correlated (r = 0.61).

Expectancy Motivation

Teacher expectation for student achievement is gaining support as an important factor in the motivation for high achievement. Anderson (1982) reported that the level of expectation teachers and administrators hold for each other, and especially for students, is the attitude most frequently associated with climate and student outcomes. Anderson concluded that staff in high achieving schools consistently "manifest attitudes of confidence that students will be able to succeed academically" (1982, p. 403).

The belief that all students can learn at high levels is a combination of the ideas on universal education and high expectations for students. The idea of universal education is found in the historical writings of Commenius (1670/1954, p. 343) who

> . . . commends, and calls for, the universal
> cultivation of the minds. . . . After all,
> experience shows that some less gifted people
> have acquired so much knowledge that they have
> surpassed the more gifted.

The work of Rosenthal and Jacobson (1968) brought attention to the idea that a relationship exists between teacher expectations and student achievement. Their work was criticized on methodology and the lack of a theoretical foundation. Expectations for student achievement have been researched in the push to define effective schools and practices. One of the most important studies was done by Edmonds and Frederiksen (1978) and involved urban schools and minority students. They found that teachers in instructionally effective inner-city schools had higher expectations for students than teachers that taught in other inner-city schools.

This finding was reinforced by the work of Brookover and Lezotte (1979) in a study involving principals and teachers. They found that staffs where achievement scores were improving had higher expectations for their students than the staffs in schools where student achievement was declining.

Similar results were obtained in 1979 in England in a study of 12 secondary schools by Rotter, Maughan, Mortimore, Ouston, and Smith. The effective school research has found a number of studies that conclude that expectancy affects student achievement (Bloom, 1976; Braun, 1976; Brookover & Lezotte, 1979; Brophy & Evertson, 1976; Brophy & Good, 1970; Brophy & Good, 1974; Clark, Lotto, &

Astute, 1984; Cooper, 1979; Dusek, 1975; Dusek & O'Connell, 1973; Edmonds, 1979; Good, 1979; Good, 1981; Guskey, 1982; Lockheed & Morgan, 1979; McDonald & Elias, 1976; MacKenzie, 1983; Phi Delta Kappa, 1980; Rosenshine, 1983; O'Connell, Dusek, & Wheeler, 1974; Rothbart, Dalfen, & Barrett, 1971; Rist, 1970; Rosenthal, 1971, 1974; Weber, 1971).

Miskel, Bloom, and McDonald (1981) used Vroom's (1964) work on expectancy theory as the model for the development of their instrument for measuring teacher expectancy motivation within schools. Vroom (1964) described the essential elements in motivation as expectancy, valence, and instrumentality. Expectancy is the belief that an individual's own efforts will lead to successful performance. Valence is the degree of desirability or attractiveness that an individual attaches to a reward. High valence means that the reward is attractive to the individual. Rewards that hold high valence for teachers are satisfaction for task achievement (high student performance) and esteem from students. The belief that a given performance will lead to attaining the rewards is instrumentality (Vroom, 1964; Hoy & Miskel, 1982). Vroom's model suggested that the propensity to start and maintain behavior was the product of expectancy, valence, and instrumentality.

This concept of motivation to pursue an objective was described by Miskel et al. (1981) as expectancy motivation. Their selection of items to portray expectancy focused on the attainment of educational objectives on student achievement. Miskel et al. (1981, p. 1) identified structural coupling and expectancy climate as two critical variables because "they define mechanisms and norms that strongly influence how individuals interact and the level of effort expended." Items on the expectancy motivation instrument were divided into either intrinsic expectancy motiviation items or extrinsic expectancy motivation items. The differentiation was based on the amount of control an individual, in this case a teacher, had on the source of the motivation. Intrinsic referred to an internal feeling of satisfaction or accomplishment in which the teacher had total control. Extrinsic referred to sources outside of the teacher, for example, behaviors of the principal. Extrinsic expectancy motivation was not controlled by the teacher.

Mulhern, 1984, in a study on New Jersey high schools, found that schools with more open climates appeared to have teachers who had a higher expectancy motivation than closed schools (p <.0006). Mulhern also found that secondary teachers with a more humanistic pupil control ideology had a higher expectancy motivation (p <.0006).

In conclusion, the research indicated a relationship between climate and expectancy motivation on the school level. An open or positive climate has been cited as a desirable characteristic in the effective school research. This open climate was correlated to meeting the needs of individual students (a humanistic pupil control orientation). Expectancy motivation was also correlated to a humanistic orientation. Mastery learning was shown to employ humanistic strategies to improve students' achievement and attitude. A teacher's positive feeling toward teaching and an increase in a teacher's feeling of responsibility for student success was also a result of utilizing the mastery learning paradigm. No research had examined the interrelationships among mastery learning, climate, and expectancy motivation on the individual level; therefore, this research studied these interrelationships.

CHAPTER 3

PROCEDURES

Introduction

The problem of this study was to investigate the interrelationships among elementary teachers' attitudes toward mastery learning, climate, and expectancy motivation. Climate was studied using principal-teacher and teacher-teacher relations, and teacher-student relations. The procedures to collect, organize, and analyze data are described in the eight major divisions of this chapter:

1) Introduction,

2) Population description and sampling procedure,

3) Definition of categories,

4) Method of collecting data,

5) Method of organizing data,

6) Statistical hypotheses,

7) Analysis of data, and

8) Precautions taken for accuracy.

Population Description and
Sampling Procedure

The population under study consisted of elementary
teachers who were employed in schools where mastery
learning has been implemented on a voluntary basis through
a five credit extension course offered by Montana State
University (MSU). The extension course, Secondary
Education 571, required the teacher to implement mastery
learning in one class for the entire school year. The
teachers were required to construct formative and summative
tests which were reviewed by the course instructor from
MSU. Large group, small group, and individual sessions
were utilized on a regular basis to introduce, monitor, and
evaluate the teachers' progress in implementating mastery
learning.

The following school districts granted permission to
the researcher to address the elementary teachers and ask
their participation in the study: Absarokee, Colstrip, Cut
Bank, Lockwood, Missoula and Roundup. The schools are
located in north central, central and western Montana.
There were approximately 8,000 students in these districts.

Absarokee contains one elementary school with 18
teachers for 197 students. Absarokee is an unincorporated
town located in south central Montana. Although it is a
ranching community, it was impacted in the 1986-87 school

year by mining industries which brought 90 additional students to the K-12 system. As of May, 1987, the growth trend was expected to continue.

Colstrip is located just north of the Northern Cheyenne Indian Reservation. Approximately 26 percent of the elementary school population is Native American. The town has a stable population of about 5,500 as recorded in the 1980 census. The main employers in the town are Montana Power and Western Energy. The students come from three socio-economic groups: ranching families, students from families associated with Montana Power or Western Energy, and Native American students from the Northern Cheyenne Indian Reservation. Colstrip contains three elementary schools, one of which participated in this study. The school participating in the study had 23 teachers for 423 students.

Cut Bank contains two elementary schools which have a total of 743 students and 60 teachers. Cut Bank is located in the extreme northern part of Montana on the eastern side of the Rocky Mountains, approximately 30 miles from the Canadian border. It is an agricultural community of ranching and wheat farming with some oil development. The community has a stable population of about 3,600.

Lockwood is located in south central Montana and borders the city of Billings, a trading center with a

population of about 66,900. The school's students come from families who work in Billings or in agricultural related fields. Lockwood contains three elementary schools which have a total of 1,270 students. Two elementary schools with 999 students participated in the study for a total of 60 teachers from Lockwood.

Missoula, with a population of 33,400, is located in western Montana. The lumber industry and the University of Montana are the main employers in the area. Missoula contains 11 elementary schools that participated in the study. Missoula had 354 teachers for 3,572 students.

Roundup is a ranching, lumber, and oil community 40 miles north of Billings, Montana. The town has a stable population of about 2,200. Roundup has one elementary school with 396 students and 30 teachers.

A ratio of sample size to independent variables of 30:1 was recommended by Kerlinger (1965) when multiple regression is used. In this study, this means that 30 teachers were needed for each of the four independent variables for a sample of 120. However, since Mosier's (1951) double cross validation was used when the relationship was significant, a sample ratio of 60:1 was sought for a sample size of 240 teachers. Anticipating a response rate of 60-70 percent, an overall sample size of 400 elementary teachers was sought.

The researcher visited each superintendent to request permission to address the principals and teachers. A meeting with each principal of the elementary schools was arranged in August or September, 1987, to discuss the focus of the study, instruments to be used, and a timeline for gathering the data. Instruments for review were given to the administrators on request. They were asked not to discuss the items on the instruments with the personnel who might be involved in the study.

Description of Categories

The study consisted of five categories: 1) attitude towards mastery learning, 2) principal-teacher and teacher-teacher relations, 3) teacher-student relations, 4) intrinsic expectancy motivation, and 5) extrinsic expectancy motivation. Each of these variables was scored on a continous scale.

The attitude towards mastery learning concerned beliefs about instruction, testing, and grading. Guskey (1987b) summarized the essential characteristics of mastery learning as feedback and correctives, and congruence among the instructional components. Feedback is essential in that it must be both diagnostic and prescriptive for what needs to be learned. The correctives must approach learning in a way different from the initial instruction.

Formative testing provides feedback and aids in the
planning of the correctives for the student. The students
must participate in the correctives in order to be directly
involved in the learning. Enrichment activities are used
to broaden and expand the learning if mastery was obtained
from the initial instruction. Congruence among the
instructional components is also essential. The four major
instructional components in the teaching and learning
process are: 1) learning objectives, 2) instruction,
3) feedback and correctives, and 4) competent learners.
Congruence among the instructional components means that
there must be agreement among the learning objectives, the
instruction, and the testing over what has been learned.
In other words, the test must match the basis for the
learning, the learning objectives, and how these learning
objectives were taught. If the learning objectives were
taught on the knowledge level, then the test must be on the
knowledge level.

In this study, climate included three categories of
relationships: 1) principal-teacher, 2) teacher-teacher,
and 3) teacher-student. Although climate is difficult to
measure (Argyris, 1958), instruments have been designed to
focus on particular aspects of an organization by
addressing only some of the dimensions. The dimensions of

principal-teacher and teacher-teacher relations are from

Halpin and Croft (1982, p. 188) and are listed in Table 1.

Table 1. The OCDQ Subscales

CHARACTERISTICS OF FACULTY AND PRINCIPAL BEHAVIOR

Faculty Behaviors:
1) <u>Hindrance</u> (HINDRANCE) refers to the teachers' feelings that they are burdened with routine duties, committee work, and other requirements that the teachers perceive as unnecessary "busy work."
2) <u>Intimacy</u> (INTIMACY) refers to the teachers' enjoyment of warm and friendly personal relations with one another.
3) <u>Disengagement</u> (DISENGAGEMENT) refers to the teachers' tendency "to go through the motions" without an actual commitment to the task at hand.
4) <u>Esprit</u> (ESPRIT) refers to morale growing out of a sense of both task accomplishment and social needs satisfaction.

Principal Behaviors:
5) <u>Production emphasis</u> (PRODUCTION) refers to close supervisory behavior on the part of the principal. The principal is highly directive and not sensitive to faculty feedback.
6) <u>Aloofness</u> (ALOOFNESS) refers to formal and impersonal principal behavior; the principal goes by the "book" and maintains social distance from his or her staff.
7) <u>Consideration</u> (CONSIDERATION) refers to warm, friendly behavior by the principal. The principal tries to be helpful and do a little something extra for the faculty when he or she can.
8) <u>Thrust</u> (THRUST) refers to dynamic principal behavior in which an attempt 'to move the organization' is made through the example that the principal sets for the teachers.

Principal-teacher relations addressed the dimensions

of production emphasis, aloofness, consideration, and

thrust in the subtest of the OCDQ. Teacher-teacher relations related to the dimensions of hindrance, intimacy, disengagement, and esprit.

A single score for climate called OPEN was the sum of the scores of the subscales of thrust and esprit minus the subscale score for disengagement. The higher the score, the more open the climate. Teachers in an open climate school work well together and evidence commitment to their responsibilities in a congenial atmosphere where acts of leadership emerge easily.

Teacher-student relations addressed control on a humanistic to custodial continuum. The humanistic approach stressed both the importance of the individual and the creation of an atmosphere that meets student needs. Learning and behavior were viewed in psychological and sociological terms. Self-discipline was substituted for strict teacher control. A humanistic orientation led to a democratic atmosphere with open channels of two-way communication between pupils and teachers and increased student self-determination.

Teachers who have a custodial orientation conceive of the school as an autocratic organization with a rigid pupil-teacher hierarchy. The flow of power and communication is unilateral and downward; students must accept the decisions of their teachers without question.