A QUASI-EXPERIMENTAL STUDY OF 5TH-GRADERS' USE OF SELECTED SELF-DIRECTING PERCEPTIONS AND LEARNING STRATEGIES

DISSERTATION

Presented to the Graduate Council of the
University of North Texas in Partial
Fulfillment of the Requirements

For the Degree of

DOCTOR OF EDUCATION

By

Pam S. Lane, B.A., M.A.

Denton, Texas

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A major change being advocated in education is that of making students more self-directing; that is, helping them become more responsible for their own learning. The focus of this investigation was on fifth grade students' use of self-directed learning strategies and self-directed perceptual skills. An experimental study was conducted using the nested design for analyzing data obtained from the Guglielmino Self-Directed Learning Readiness Scale, the Zimmerman and Martinez-Pons' Self-Regulated Learning Interview Schedule, and the Bradley-Lane Self-Directing Perceptual Scale. One hundred fifty-two fifth graders were involved in the eight week study along with their six teachers. Both students and teachers were immersed in a module of training that included emphasis upon self-directing behaviors and learning strategies. Two striking findings emerged; namely, (a) in comparing the average number of learning strategies acquired after treatment, the experimental group (low, middle, and high IQ levels) scored 40%, 50% and 29% higher respectively, than did the control

group; (b) in comparing the fifth grade students use of learning strategies it was found that most students nearly doubled the number of learning strategies they had previously acquired. Thus, it was concluded that children who do not have actual teaching of information or data concerning learning strategies will likely never acquire the same repertoire of skills that students acquire when exposed to this critical information in some specific, systematic fashion.

A primary product developed for the purposes of this investigation was the Bradley-Lane Self-Directing Perceptual Scale--a 132-item Likert Scale designed to identify the self-perceptions of elementary and middle school students. After field-testing, a chi-square treatment was applied to each item of the Perceptual Scale resulting in a reliability of $p<.01$ for the majority (79%) of the test items, while an additional twelve items (9%) were found to be reliable at the .02 level of significance.

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CHAPTER I

INTRODUCTION

Background of the Present Study

Recent periodical literature and prominent professional authors are purporting the idea that schools must become facilitative if education is to accomplish in positive ways its principle task--the academic, social, and personal growth of children. It is not simply that facilitative education is desirable; rather, this kind of education is essential if our society is to become a learning center in which each individual can attain his maximum potential and wield his self-directing powers. It is believed that traditional modes of teaching for the most part are undergoing change. One change being advocated is that of making students more <u>self-directing</u>, that is, helping them become more responsible for their own learning. When a student is encouraged to participate in the learning process, to learn how to learn, learning is enhanced. Therefore, students should be encouraged to make decisions (choices), choose directions, and discover their own learning resources.

Self-directing learning involves the whole person, feelings as well as intellect. Learning about oneself and

putting the new knowledge into practice in everyday living is the most pervasive and lasting kind of schooling. Being stimulated by another to explore a subject may enhance learning, but the sense of self-discovery, of reaching out, and of grasping content and comprehending its meaning must come from within the learner. Therefore, the most effective kind of learning is self-directed learning, promoted and encouraged by a facilitating type of teacher. It is believed that self-directing learners exercise not only more responsibility over their own lives but become more responsible and assertive to needs of society. Just as William Kilpatrick (1937, p. 52) once averred: "For democracy to be learned it must be lived." Likewise, for responsibility to be learned, it too must be lived. For responsible citizens to emerge from public schools, public schools must foster in students the innate desire to be in control of their own lives, both in their day to day interactions as well as in the inner workings of their own minds.

Being in control of one's learning in adult and continuing education, as well as in health professions, has been referred to as self-directed learning. While people in these fields have conducted a vast amount of research in this area, relatively few studies have been conducted with elementary age students, even though growing interest in self-directed learning in education has existed for over 30

years (Boyer, 1983; Sizer, 1984). One of the major aims in educating young people is to foster in them the desire to be in control of their own learning. Therefore, discovering the antecedents and components of developing self-direction in learners is an avenue which needs immediate attention. As so forcefully noted by Katz: "Clearly, it is not very useful [for students] to have skills if the disposition to use them is undermined in the process of acquiring them" (Katz, 1989, p. 32). Hence, one of the purposes in this study is to discover if giving children more responsibility in their learning will increase their disposition to go on learning (as inferred from data derived from the Self-Directing Perceptual Scale).

One of the most basic concepts underlying self-directed learning is the opportunity for students to make decisions in the classroom. This opportunity for students to make choices without exogenous pressure results in higher quality engagement and output (Kruglanski, 1978), as well as increased motivation to learn and increased effort expanded on learning (Corno & Rohrkemper, 1985). Naturally, allowing students options means that the teacher is sharing some of the classroom responsibility with the students. Weinstein and Marshall (1984) see the following areas as ones appropriate for student decision making: the sequencing of tasks completed, the pace of the task completion, groups with whom one will work, the creation and direction of

learning tasks and the establishment of learning goals. This is not to say that teacher direction and guidance is non-existent. On the contrary, the teacher's role, while being modified from the traditional sense, involves a full range of facilitating, supportive behaviors. As averred in a recent publication (Bradley, 1991) Teaching for Self-Directed Living and Learning in Students:

> As long as judgment making regarding a student's educational program remains a function of the teacher, it will do little to help him [the student] become more of a self-directing person. The modern teacher gives a student a share in deciding what is best for him, and through this participation, there is greater assurance that each student will be more self-directing [thereby] serving the purposes of a democratic society. Democracy is so hard to get, but so easy to lose. It implies more restraint than any other form of government. The most important outcome of formal education in a democracy is the ability to be self-directing (p. 103).

Donald Kennedy, President, Stanford University, in a letter sent to 3,000 college and university presidents prudently said:

> It simply will not do for our schools to produce a small elite to power our scientific establishment and a larger cadre of workers with basic skills to do routine

> work. Millions of people around the world now have these same basic skills and are willing to work twice as long for as little as one-tenth our basic wages. To maintain and enhance our quality of life, we must develop a leading-edge economy based on workers who can think for a living. If skills are equal, in the long run wages will be too. This means we have to educate a vast mass of people capable of thinking critically, creatively, and imaginatively (Critical Thinking and Education Reform, 1991, p. 1).

Thought and content are not antagonists but inseparable partners. Likewise, self-directed learning and achievement of skills for the workplace are also inseparable. Thinking requires content; jobs require self-directing behaviors and basic skills, as well as intra- and inter-personal skill of communication and personnel relationships of the highest order for success purposes. It is cynical to substitute mere test score achievements for genuine skills and knowledge and thus deny students the opportunity to become self-directed, motivated, rational persons.

In our increasingly complex and diverse society, countless pressures are placed on public schools and more specifically the public school teacher to produce higher and higher levels of student achievement. Yet, the teacher is not the sole person in the education process. A student's responsibilities in the learning process should also be

considered. Student "control", student "initiative" or student "desire" has received relatively little attention. Therefore, one of the main underlying themes of this research is to provide opportunities for students to exercise some control over the pursuance of their own intellectual interests.

Statement of the Problem

This investigation is to ascertain if children's perceptions of their role in learning can be enhanced to produce greater use of the self-directed learning strategies presented in this study.

Purposes of the Study

The purposes of this study are to determine if:

1. There is a significant difference between the scores of students who received training in self-directed learning strategies and perceptual skills and those who did not. Student scores for these four cited purposes come from Zimmerman and Martinez-Pons' Self Regulated Learning Interview Schedule and the Self Directing Perceptual Scale.

2. There is a significant difference between the students' use of perceptual skills and self-directing learning strategies as related to their level of readiness to self direct.

3. There is a significant difference between boys' and girls' use of perceptual skills and their use of learning strategies.

4. There is a significant correlation between students' use of perceptual skills and their use of learning strategies.

Statements of Hypotheses

1. There will be no significant difference between the posttest scores of the groups which received no training in learning strategies as measured by Zimmerman and Martinez-Pons' Self-Regulated Learning Interview Schedule and the posttest scores of the groups which received training.

2. There will be no significant difference between the girls' and boys' mean posttest scores on the Zimmerman and Martinez-Pons' Self-Regulated Learning Interview Schedule for the experimental group when the scores have been adjusted to account for the effects of the pre-test scores.

3. There will be no statistically significant difference between the posttest scores of the groups which received no training in perceptual skills as measured by the Self-Directing Perceptual Scale and the posttest scores of the groups which received training.

4. There will be no significant difference between the boys' and girls' mean pre- and posttest scores on the Self-Directing Perceptual Scale when the scores have been adjusted to account for the effects of the Guglielmino Self-Directed Learning Readiness Scale.

5. There will be no significant correlation for the experimental group between individuals' pre-test scores reflecting readiness to self-direct, as identified from Guglielmino Self-Directed Learning Readiness Scale and individuals' pre-test scores reflecting use of self-directed learning strategies, as identified from the Zimmerman and Martinez-Pons' Self-Regulated Learning Interview Schedule.

6. There will be no significant correlation for the experimental group between individuals' pre-test scores reflecting readiness to self-direct, as identified from Guglielmino Self-Directing Readiness Scale and individuals' pre-test scores reflecting students' perceptual skills on the Self-Directing Perceptual Scale.

7. There will be a significant correlation between the experimental groups' individual student's posttest scores on the Self-Directing Perceptual Scale and the experimental groups' individual posttest score on the Zimmerman and Martinez-Pons' Interview Schedule.

8. There will be a significant correlation between the control groups' individual student's posttest scores on the Self-Directing Perceptual Scale and the control groups' individual posttest scores on the Zimmerman and Martinez-Pons' Interview Schedule.

Limitations of the Study

1. The time length for the conduct of this study was approximately eight weeks. For some children, this may not

have been enough time for them to allow the new ideas to incubate in their minds for natural (instantaneous) recall and use, or to phase out old habits.

2. The nature of the experimental groups, the teaching staff or the setting may restrict the fullest implementation of the treatment.

3. The interview process by necessity is imposed due to the belief that the Zimmerman and Martinez-Pons' Interview Schedule is the most comprehensive instrument dealing with learning strategies currently available.

Basic Assumptions

Major assumptions which are entertained in this study include:

1. Fifth-grade students can be taught self-directed learning techniques.

2. The style of the teachers agreeing to participate in the study is congruent with the philosophy of the proposed program.

3. Children's beliefs about their own ability to perform an action affects their self-efficacy and their self-directing behaviors (Bandura & Wood, 1989).

4. The nested design minimizes statistically the affect of the individual classroom climates effect upon the dependent variable.

5. The teachers have adequately and explicitly carried

out the instructions in the manual and in-service tutorship provided by the investigator.

Definition of Terms

Attributions: Learner's perceptions of the causes of their academic outcomes (Schunk, 1990).

Control theory: The belief that not one thing we do is caused by persons or situations outside ourselves (Glasser, 1984). A major premise of this theory is the belief that individuals have control over their thoughts, feelings and actions. A second and related emphasis is the belief that people are motivated by basic needs: freedom, love, belonging, power, fun, to survive and reproduce.

Guglielmino SDLRS: The Guglielmino Self-Directed Learning Readiness Scale (SDLRS) is referred to as the Guglielmino SDLRS in this study.

Metacognitive dialogues: Focusing the child's attention on ways of thinking about learning in everyday settings; to make a child's own thinking an object of his or her thinking.

Metacognitive listening: The process of cognitively monitoring one's understanding through the use of self-questioning strategies.

Perceptual Scale: The 134-item scale developed by Bradley and Lane is intermittently referred to as SDPS (Self-Directing Perceptual Scale).

Psychic nutrition: The satisfying feedback students give themselves for making contributions to others.

Self-directed learning: The ability of students to take actions directed at acquiring information or skill. In the manuscript self-directed learning may be referred to as SDL.

Self-directed living: The ability of individuals to be in charge of their (thoughts) perceptions, feelings, and actions commensurate with their maturational growth and developmental abilities.

Self-direction: The ability of students to take actions directed at acquiring information or skills and developing and maintaining positive habits of thought.

Self-efficacy: A person's development and maintenance of positive beliefs about learning capabilities (Schunk, 1990; Bandura, 1989).

Self-regulated learning: Learning that occurs from students' behaviors that are systematically oriented toward attaining learning goals.

Zimmerman and Martinez-Pons' Interview: The Zimmerman and Martinez-Pons' Self-Regulated Learning Interview Schedule (SRLIS) is referred to in this study as the Zimmerman and Martinez-Pons' Interview.

Significance of the Study

This study provides evidence to support the practice of teaching all academic levels of children (high, middle and low) how to learn the various subject matter presented to them. In an age of unprecedented growth in knowledge per se, the perceptual and academic skills needed to be self-

directed learners are of paramount importance.

The focus of this study is on fifth-grade students' use of self-directed learning strategies and self-directed perceptual skills. Additionally, it:

1. provides some answers to much needed research on the use of self-directed learning strategies of intermediate grade students

2. provides significant insights into children's perceptions of self-direction

3. makes a contribution to the theoretical literature of self-directedness and

4. stimulates further study in the area of self-directed learning strategies and student perceptions of abilities to self-direct.

Preview of the Organization of the Study

The following brief preview of chapter organization is presented as an aid to the reader who may wish to refer to a particular section of this study for specific information.

Chapter I deals with background information, statement of the problem, purposes of the study, hypotheses, limitations, basic assumptions, definition of terms, and significance of the study. Chapter II contains a review of current literature related to self-directed learning. The possible correlates (achievement, cognitive ability, self-concept and self-efficacy) as well as the antecedents (knowledge and skills) are presented in Chapter II. Also

included in Chapter II is a brief, but concise section on the influence of the related literature review upon the methodology of this study. Included in Chapter III is a description of the sample, instrumentation, experimental treatment and the procedures for collecting data. The findings of the research, relevant to each hypotheses in this study are presented in Chapter IV. A review and summary of the findings are found in Chapter V with resultant conclusions, implications and recommendations for further study.

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CHAPTER II

REVIEW OF RELATED LITERATURE

Current educational literature on self-direction contains evidence of some of the possible correlates, antecedents, and long term benefits of self-direction. The possible correlates of self-direction include items such as achievement, cognitive ability, cerebral dominance and self-concept (Eisenman, 1988; Hall-Johnson, 1985; Hudson, 1986; McCombs, 1986; Zimmerman and Martinez-Pons, 1986). The antecedents of self-directed learning, as researched by Bandura (1989), include: a resilient sense of efficacy, knowledge and skills. The long term benefits of self-directed learning (Weikart, Epstein, Schweinhart and Bond, 1978) are also presented in this chapter.

Each of these antecedents and correlates occur within the context of a classroom setting. It is in this classroom setting that the inter-relationship of children's native curiosity, their desire to assert themselves and traditional teaching practices often collide. This review is to present a synopsis of the current literature and significant research related to these interacting variables.

The conceptualization of self-directed learning as presented in research writing and periodical literature

varies. For this present work, self-directed learning is defined as the ability of students to take actions directed at acquiring information or skill, and to develop and maintain positive habits of thought. So far, in the literature, a lack of consensus is obvious with respect to what self-directed learning entails. Thomas, Strage, and Curley (1988) see two basic types of self-directed learning: cognitive and self-management. Scobie (1983) identifies five characteristics of self-direction: motivation, perceived relevance, planning, experiencing and assessing. Also, a continuum of SDL dimensions are identified by Dirkes (1985) ranging from "following teachers directions" to "acting from a commitment." Yet, the most comprehensive work to date is by Zimmerman and Martinez-Pons (1986). They conceptualize self-directed learning as including metacognitive, motivational and behavioral components.

> In terms of <u>metacognitive processes</u>, self-regulated learners: plan, organize, self-instruct and self-evaluate at various stages during the acquisition process. From a <u>motivational</u> vantage, self-regulated learners perceive themselves as self-efficacious, autonomous and intrinsically motivated. In terms of <u>behavior</u> self-regulated learners select, structure and even create social and physical environments that epitomize acquisition (p. 284).

According to this view, there is a connection between the feelings (perceptions), actions (behavior), and thinking (metacognitive processes) of students who self-direct.

Correlates of Self-Direction

Achievement

The first possible correlate of self-directed learning is achievement. Much emphasis has been placed on achievement test scores in the last decade. Hence, identifying links between high achievement and strategies for learning has become a central task of educators.

Zimmerman and Martinez-Pons (1986) have identified a link between high achievement and the use of self-regulated learning strategies. In their study, forty male and forty female 10th-grade students from a high achievement track were identified. These high school students were interviewed concerning their use of self-regulated learning strategies during class, homework, and study. Fourteen categories of self-regulated strategies were identified. They include items such as checking over their work, monitoring their own understanding, initiating efforts to get help from peers, teachers or other adults and structuring the environment to limit distractions. Low achievers used some of these strategies occasionally, but not in a consistent or "determined" manner.

The 14 categories served as the basis for the self-directed learning strategies which were taught to the

students in the experimental group. In Zimmerman's work, self-evaluation was defined as checking over one's completed work. In the present study, self-evaluation was extended to include self-monitoring of specific skills such as monitoring one's reading rate, monitoring the number of words a student's eyes pick up in one fixation and monitoring progress toward goals. Additionally, active listening skills were taught. Active listening is a metacognitive skill which has a powerful affect on learning (Devine, 1987). Therefore, it was also included in the self-evaluation category of the Zimmerman and Martinez-Pons' work.

Cognitive Ability

Another possible indicator of self-directed learning is one's cognitive ability. Since a correlation between high achievers and the use of self-regulated learning strategies has been identified (Zimmerman & Martinez-Pons, 1986), one could infer a correlation might exist between ability and self-directed learners. Eisenman (1988) sought to determine if indeed there were a correlation between cognitive ability and SDL in children. Eisenman used the Guglielmino Self-Directed Learning Readiness Scale and the Cognitive Ability Test. He found no significant relationship between SDLR's scores and student's Cognitive Ability Test scores.
Yet, as Zimmerman & Martinez-Pons point out, it is possible that one might have the potential ability and not know

strategies for learning. This is precisely the basis for the present research. Students in schools today appear to be "taught" countless ideas yet the most important and possibly the most neglected area is the need to teach children how to learn what it is teachers are trying to teach them. Therefore, focusing on teaching strategies of learning to all students in the experimental group, regardless of their ability is a vital aspect of this study.

Cerebral Dominance

In an investigation of 32 fourth- and fifth-grade students and their teachers, Hudson (1986) sought to identify indicators of student's readiness for self-directed learning. Students completed two self-report questionnaires: Torrances's Your Style of Learning and Thinking and Guglielmino's Self-Directed Learning Readiness Scale. The items on the SDLRS were based on eight factors and teachers rated students on the same eight factors on a specially prepared document for that purpose. It was assumed that regular and gifted students were equally ready for self-directed learning. It was found that students were equally ready for self-directed learning regardless of their cerebral dominance. Interestingly, fourth-grade teachers rated students with a right-hemisphere preference significantly higher than students with a left-hemispheric preference, while fifth-grade teachers rated left-and right hemispheric preferenced students equally ready for

self-directed learning. The conclusion reached that teacher judgment may not be an accurate indicator of students' readiness for self-directed learning, seems tenable. Moreover, the data allows one to infer that teachers should not equate IQ with self-direction, nor should one expect gifted students to function as self-directing learners without guidance. With respect to hemispherisity, the study showed that students who had a left- or right-brain dominance were equally ready for self-directed learning. In retrospect, it seems that research is needed to see if teachers might assess the perceptions of their students as to what causes them to work on their own, to see if these observations would yield any pertinent indicators of a student's readiness to self-direct.

Self-Concept

Self-concept has been found to be related to self-directed learning as a readiness factor and a positive self-concept appears to be a precursor of self-direction. In a study by Hall-Johnson (1985), self-concept was found to be the readiness factor that best predicted the number of self-planned projects and the amount of time spent on them in a self-directed learning project. While their research was conducted with college students it does indicate a correlation between self-concept and self-directed learning.

Also emphasizing the importance of self-concept, Corno and Rohrkemper (1988) found that some children with negative

self-concepts, sabotaged their own efforts so that the results of their actions further reinforced their negative views of self. The debilitating effect of a negative self-concept can inhibit the strategic thinking in students. When confronted with difficulty this generally negative self-perception seems likely to increase stress, reduce task initiation and inhibit enhancing self-involved inner speech. Hence, one's perceptions of self appear to facilitate or inhibit the use of successful learning strategies (Webster and Sobieszek, 1974).

McCombs (1986, p. 315) contends: "Until students develop a stable sense of positive self-identity which is reinforced by successful learning experiences, it is not possible for them to engage in the type of self-motivation processes that can generate the positive affect and motivation to be self-regulated learners." While the sequence that McCombs suggests has not been verified, empirically the strong interdependence and inter-relationship among these factors seems tenable. McCombs believes the sequence to occur in the following order: (a) a student develops a stable sense of a positive identity; then (b) their identity is reinforced by successful learning experiences; and (c) the student engages in self-motivational process which results in positive affect and motivation. McCombs' work focuses upon the idea that if one changes the behavior of a student, then corresponding thoughts and

feelings will follow (Glasser, 1986). Thinking through why one acted as he did, and responding accordingly, yields the type of thinking that should bring forth better actions next time. Succinctly put, the student acquires learning strategies, experiences success through the use of the strategies, which in turn allows him to experience efficacy, competence and a more positive identity. This later sequence is, in effect, what the researcher of the present study sought to produce in students. By students engaging in meaningful, self-chosen learning activities, a more successful learning experience should follow. When the teacher offers options, the student typically takes pride in the fact that he is trusted to make decisions for himself and he responds with increased motivation and persistence in learning.

Based on McCombs' work cited above, and the additional studies of Purkey (1987) and Coopersmith (1967), intrinsic reinforcements (pleasure, pride, satisfaction) serve to increase the likelihood that a student will repeat the behavior that led to the feeling. Children who learn to set goals create expectations within themselves about what kinds of consequences are likely, and use them to judge their own performance. Intrinsic reinforcements and personal motivation are also self-directing behaviors that are learned.

Self-efficacy

Self-efficacy and its effect on motivation and action, has been a topic of investigation for several years (Bandura, 1986, 1989). Self-efficacy is defined here as a person's beliefs in one's own capabilities to mobilize the motivation, cognitive resources, and courses of action needed to meet given situational demands. Bandura (1989), states: "...people who have a high sense of perceived self-efficacy in a given domain think, feel, and act differently from those who perceive themselves as inefficacious. For example, people who doubt their capabilities shy away from difficult tasks" (p. 731). They think negative thoughts, dwell on the adverse consequences of failure, and worry about the difficulty of the task. People with a low sense of self-efficacy do not set high goals nor do they have a strong commitment to the goals they set. In the face of difficulty these people slack up on their efforts, do not exert much cognitive effort and in essence, give up quickly. Also, when suffering a setback people with a low level of self-efficacy recover slowly.

In contrast, a person with a resilient sense of efficacy seems to thrive on difficult tasks. They involve themselves in thinking positive thoughts about themselves, visualizing success, and how to meet the challenge of the task. People with a high sense of self-efficacy set goals for themselves and possess a high degree of commitment

toward attaining their goals. These people heighten their efforts when setbacks occur. They believe their setbacks are results of insufficient effort. When suffering a setback high self-efficacy people recover their sense of efficacy quickly. They believe they have some control over their stressors. In short, people with a high level of self-efficacy make things happen rather than just allowing things to happen to them (Bandura, 1989). Bandura has identified several ways to enhance self-efficacy which will be used to guide an aspect of this work. (See Efficacy and Self-Directed Learning as mentioned below.) In the previous section, achievement, cognitive ability, self-concept and self efficacy were identified as correlates of self-direction.

Antecedents of SDL

There are three major antecedents to self-directed learning. They include a resilient sense of self-efficacy, knowledge and skills (Bandura & Wood, 1989). Respectively, these three factors encompass the feeling, thinking and doing aspects of one's total being.

Efficacy and SDL

The development of self-regulated or self-directed capabilities requires instilling in students a) a resilient sense of efficacy and b) imparting knowledge and skills (Bandura, 1989). The precursors (or antecedents) of a resilient sense of efficacy are identified below.

They include:

1. direct mastery experiences

2. observing people similar to oneself succeed by perseverant effort

3. judgments of bodily states and various forms of somatic information

4. social persuasion that one possesses the capabilities to succeed (1-4 Bandura, 1989)

5. construing ability as an acquirable skill (Bandura & Wood, 1989).

In the field of psychology several noted authorities (Bandura & Wood, 1980; Schunk, 1989) purport that high efficacious people tend to focus on the task itself and not on themselves, their deficiencies or their limitations. Assisting students in monitoring and adjusting their inner thoughts so that they may focus more steadily on tasks at hand, rather than to dwell on their faults, mistakes, and misunderstandings, should become another major goal of the school.

Providing social persuasion that one possesses the capability to succeed is also believed to be a powerful tool in the minds of students. For example, if students are told the skill they wish to acquire is attainable through hard work, that it is within their realm of ability, and that it can be achieved through diligent effort, then those students have received attributional feedback that links their

successes with their efforts and abilities. This type of feedback has been well documented by Schunk (1990). He demonstrated that by providing students with attributional feedback, self-regulated learning itself is enhanced. Students who learn to "attribute their successes to their abilities and efforts are likely to feel efficacious about learning and engage in self-regulatory behaviors that further increase their skills" (Schunk, 1990, p. 8). Lastly, construing ability as an acquirable skill is an antecedent to a sense of efficacy. Although it is indicated by psychologists that a child inherits, through the genes, certain traits and capabilities which can enhance or stifle his academic performances, there are other researchers (Gardner, 1983; Torrance, 1977) who contend that intellectual ability is not a fixed entity--intelligence is learned. With nurturing, proper instruction and related experiences, intelligence, like emotional behavior, can also be changed. Therefore, teachers were expected to foster in their students the belief that they can enrich their own capabilities through the above-mentioned avenues.

Two additional criteria have been identified as enhancers of self-efficacy. They include:

1. selective recall of success (Bandura, 1986) and
2. induced positive mood (Kavanaugh and Bower, 1985; Bandura, 1989).

Certainly most teachers can identify with the importance of

a positive achievement mode as it relates to "a positive flow" or "a creative attitude" that seems to be an ideal state of mind for productivity.

Knowledge and Skills

Some select skills of self-directed learners have been identified by Zimmerman and Martinez-Pons (1986). They include self-evaluation, organizing and transforming material, goal setting and planning, seeking information, keeping records and monitoring, environmental structuring, self-consequences, rehearsing and memorizing, reviewing and seeking assistance. Additionally, metacognitive listening has been identified as a learning strategy (Devine, 1987).

Self-Directed Learning and Long Term Benefits

After comparing, through age 10, the intellectual and scholastic performance of children who had participated in the High/Scope Preschool Curriculum Study (which included three diverse curricular approaches to early childhood settings), Weikart, Epstein, Schweinhart & Bond (1978) concluded that the students from each of the three curriculum groups appeared to achieve the same positive results. They also concluded that high quality pre-school programs for poor children can lead to improvement in their intellectual and scholastic performance. This finding, with regard to equivalence of programs, was verified by the Consortium for Longitudinal Studies (1985).

Recently, Weikart's et al. (1978) examination of new data from the High/Scope Preschool Curriculum Study suggests a more complex conclusion. When data were collected on the children of the Preschool Curriculum Study Project, at age 15, the students who were encouraged to initiate their own activities in a specially prepared environment evidenced substantially lower rates of self-reported juvenile delinquency and associated problems (as compared to the children who received a preschool program using a strong teacher-directed model).

It is clear that the Weikart et al. (1978) study was conducted with poor children who were at risk of school failure and that these findings cannot be generalized to types of children who were involved in this present study. Yet, it does present evidence of the long lasting social benefits of allowing poverty level children to involve themselves in student-initiated activities.

Observations of Noted Authorities

In a concerted effort to give students more choice in what they learn and how they learn it, and with the ultimate goal being that of developing children into caring adults, two California school districts designed a project in pro-social education. The Child Development Project (CDP) beginning in San Ramon Valley and expanding to nearby Haywood, has received high acclaim from Alfie Kohn (author, The Brighter Side of Human Nature, 1990). Kohn (1990)

suggests that to help youth grow into caring adults they must not only be taught by adults who care themselves, but students must have early school experiences that teach them to care about others. Staff researchers focused on a group of children in the experimental schools (then in kindergarten and now in junior high school) and found that achievement differed significantly from those of their counterparts in the comparison schools. Children in the experimental schools were invited to give suggestions on "How we want our classroom to be?"

The primary components of cooperative learning that does not rely on grades or other extrinsic motivators were developed. An approach to classroom management was used to help children participate productively (recognizing the feelings of others; waiting turns by choice, etc.) in the classroom. An atmosphere was created in which teachers were encouraged to develop warm relationships with the children; plus, periodic class meetings were held so that children could play an active part (role) in planning, assessing progress, and solving problems.

The Pilot Program investigators have revealed that by the time the CDP group reached sixth grade, the children in these two elementary schools were outscoring their counterparts in the comparison schools on a measure of higher-order reading comprehension. Moreover, the experimental pupils were more likely to speak up in a

discussion (self-directing behaviors) even if one's position seemed unlikely to prevail (which also answers another question for those concerned about the assertiveness of caring children). It remains to be seen whether or not the thinking, values, and behaviors of children from schools using the CDP will continue to distinguish them from those who attended the comparison schools. What was discovered in the CDP project provides background evidence of the importance of certain hypotheses researched in this current dissertation: What children learn about controlling their own behaviors through their own perceptual powers, will not only give them a vehicle to become a better learner, but simultaneously, attend to what students need to learn in the classroom about getting along with their peers. Children can indeed be shown how to work with, care for, and help one another--in turn, they've helped themselves to self-direct.

For too long, now, the typical American classroom has tended to focus on curbing negative behaviors rather than on promoting positive ones; focusing on group problems, rather than on private, individual ones. But when these problems are framed into self-directing entities, the issue may also tell us something about our own view of what comes naturally to children, what they are capable of, and, by extension, what lies at the core of our species--basic human needs (Glasser, 1986).

Related Literature Summarized

An assumption often made by those looking at the concept of self-directedness for the first time is that learning takes place in isolation, such as when a child is doing homework or working on a classroom assignment made by the teacher. However, as the research review shows, self-directing students work with others; they demonstrate their skills to classmates; they teach others in cooperative learning situations. Self-directed learning is not always an isolated experience. What self-directed learning does mean is that the learner assumes a reasonable amount of control over decisions about planning, implementing, and evaluating the learning experiences that the school has to offer. Consequently, students need several strategies from which to choose to do their assignments; a single strategy may not always serve their learning needs. Additionally, the way a student sees himself affects the extent to which he is willing to take risks on his own--to self-direct. Researchers show that teachers need to continue to work on helping students to experience success in school.

What children learn from reinforcement and from modeling by their teachers does not just affect overt behavior but also ideas, expectations, internal standards, self-concepts, and perceptions. Once a student processes the feedback from others and uses it to establish standards to work, play, and live by, these standards (beliefs,

expectancies) are hard to change. Changing someone's belief about their ability to do something has a greater impact on behavior than merely reinforcement for performing that behavior.

Metacognition (an individual's knowledge of his own thinking processes) is becoming a key concept in the teaching profession. Researchers have been active in studying how children know what they know and how they can be more effective in learning and remembering.

These final important points were gleaned from the research presented: (a) self-directing behaviors are learned (acquired); (b) self-directing learners become more highly motivated than conforming students who only do what they are assigned; (c) assisting a student with developing his/her own perceptions is just as important to learning as the teaching of academic subjects; and (d) it is important to think of the power of self-direction in learning from a lifelong learning perspective.

Influence of the Related Literature Review Upon the Methodology of This Study

The related literature and research reviewed in this chapter had a direct impact upon the methodology and initial conduct of this study. These influences have been synthesized in concise form and are presented in this short section.

Bandura's (1989) antecedents presented on page 25 of this chapter served as a foundation for influencing the experimental teachers in becoming well acquainted with how to help children bring about the results in learning they wanted in their own personalized study situations. The philosophy that students should learn how to learn, pervaded throughout the conduct of this present experimental study.

Zimmerman and Martinez-Pons (1986) through their research, identified specific skills of self-directed learners and those formed the basis for the training of the experimental groups of this current investigation. Additionally, metacognitive listening was identified as a learning strategy (Devine, 1987) and it was included as part of the training for the experimental group of students.

The definition of self-evaluation, given on page 19 of this chapter, was broadened to include monitoring of specific skills such as one's own reading rate, eye fixations, metacognitive listening, and progress toward goals. In applying self-evaluation strategies to several different disciplines it was believed that students would be able to see how the selected learning strategies provided them could be applied in different areas of their personal training and learning.

Drawing from Albert Bandura's (1977) social-learning theory, it can be safely said that observational learning (modeling behavior) is not essentially automatic. One is

unlikely to become a better tennis player by merely watching someone else play who is an expert. Rather, one is influenced by what he teaches himself to pay attention to--in such settings he may not always know so he needs "invited" help; someone who can help him make sense out of what he saw and then assist in how to remember it. In this present study, Bandura's research brought more vividly to the attention of this investigator that structure of the classroom environment promotes the behaviors teachers see in their students. Bandura said it precisely, "Except for elementary reflexes, people are not equipped with inborn repertoires of behavior. They must learn them." (Bandura, p. 16). Of course, he was alluding to personality traits and behaviors also, but Bandura presents the case that environment is a major "cause" of the behavior observed in people. His observations strengthen this current investigator's position that learning strategies of students must be taught.

Schunk (1990) presented evidence that students who feel their successes are derived from ability and effort engage in self-regulatory behaviors that further increase their skills. Differentiating between the two terms, effort feedback is more appropriate when tasks are somewhat difficult or when referring to prior achievement, while ability feedback is more appropriate for tasks in which children are learning quickly, or when referring to future

achievement. The appropriate use of both of these types of feedback (Schunk, 1990) is one of the ways (identified by Bandura, 1989) to enhance students self-efficacy--a requirement for developing self-directed capabilities. In light of Schunk's findings, it would seem that teachers should incorporate the use of attributional feedback into their respective teaching styles. Experimental teachers in this study were encouraged to help students feel good about themselves, to identify their strengths and weaknesses, and to seek advice on how to use their talents and abilities more effectively on tasks assigned.

The enhancers of self-efficacy identified on page 27 of this chapter were incorporated into this study through the use of group activities (teaching a skill learned to another student on the team), and by assisting students in identifying perceptions which would help them attain a positive achievement attitude or positive achievement "mode." The student who can recall what brought forth success sets the tone and a positive mood for himself that should yield further success.

If this short section at the end of this chapter has shown several specific instances in which the related literature influenced the investigator in the conduct to this original study, then it has served it purpose.

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CHAPTER III

METHODS AND PROCEDURES

In Chapter I the background, significance, general statement of the problem, purpose, statement of hypotheses and definition of terms used in this study were given. The research specifically related to this study was presented in Chapter II. This chapter is concerned with research methodology and the procedures followed in the collection of data.

General Design

The general design of this study was quasi-experimental as the participants selected for the study were in in-tact groups. A nested design (Appendix K, p. 169) was incorporated in analyzing hypotheses 1 and 3 because the classrooms are nested within the treatment. There are six classrooms in this study, three experimental and three control. These classrooms are considered one factor (B) of the design. The other factor of the design is the condition (A): experimental group or control group. In a nested design each level of the nested factor B (classrooms) appears with only one level of treatment A (experimental or control). B is said to be nested in A, B(A), that is,

classrooms are nested within one level of treatment either experimental or control.

The variable of the classrooms are included in the design because the experimenter suspects that they might affect the dependent variable. This design allows the experimenter to isolate the nuisance variables of classrooms, which might contribute significantly to the total variation in the student's scores (Kirk, 1982).

The nested design was not used in Hypotheses 2 and 4 because the nested design requires two or more levels on each of the factors (Kirk, p. 456). Since these hypotheses deal with the experimental group only, the two levels (experimental and control) are limited to the one level--(experimental group only) in these two aforementioned hypotheses.

To obtain permission to conduct this study, a letter was sent to the Director of Research and Development of a 5A School District in North Central Texas on February 10, 1992. Permission to conduct the study was obtained via a phone call on February 28, 1992.

Three instruments were used in the study: the Guglielmino SDLRS (Appendix A, p. 116), the Zimmerman and Martinez-Pons' Self-Regulated Learning Interview Schedule, (Appendix B, p. 121) and the Self-Directing Perceptual Scale (Appendix C, p. 129). Permission to use and modify the Zimmerman and Martinez-Pons' interview was obtained on

February 13, 1992 (see Appendix D, p. 138). For descriptive statistics for each instrument, see Appendix M, p. 178.

Principals and teachers were contacted the week of February 28 to establish the testing schedule. The interview pre-tests for the experimental group began on March 2, 1992 followed by the Guglielmino and Perceptual Scale which were all completed by March 13, 1992. Pre-tests for the control group began on March 9, 1992 and were concluded on April 3, 1992. (Spring Break for this district occurred during the third week of March.)

Treatment began during the second week of March with a one-hour workshop with the experimental group teachers. The composition of what took place in the workshop appears in detailed form in Appendix E (see p. 140). Two planned meetings followed the initial workshop to discuss specific activities individually with each teacher.

Treatment for the students began on March 23, 1992 and was concluded on May 20, 1992. The length of treatment was seven and one half weeks. (Six days of district-wide testing occurred on April 7-9 and April 14-16.)

Posttests began on May 21, 1992 for the experimental groups and May 26, 1992 for the control groups. All posttests were concluded on May 29, 1992. Make-up tests were conducted through June 3, 1992.

Sample

Three elementary schools in an accredited (5A) school district located in North Central Texas were selected for this investigation. The socio-economic level and enrollment figures were as follows:

School A	high SES	628 Students
School B	low SES	702 Students
School C	middle SES	626 Students.

(The district determined the socio-economic level based on the percentage of the total school population that qualified for free lunch.)

Two fifth-grade classes were selected from each school on a willingness to participate basis: one class for the experimental group and one class for the control group. All students were assigned identification numbers so that their identities could remain confidential.

The demographics for the experimental group as a whole were as follows: 33% of the children were from single parent families; 45% of the students were designated by district guidelines as "at risk." Ethnically, 15% were Hispanic; 16% were African-American and 69% were Euro-American. No Asian-Americans were present in the experimental groups.

In the control groups, 37% of the children were from single parent families, and 45% were designated by district guidelines as "at risk." Ethnically, 17% were Hispanic, 12% were African-American, 5% were Asian-American and 66% were

Euro-American. According to gender, there was a total of 41 boys and 34 girls in the experimental groups (n = 75) and 36 boys and 41 girls in the control groups (n = 77).

Special service personnel were not involved with one group more than the other. Each campus had the same services available for Physical Education, Music, Speech, and Counseling.

The experimental group teachers had 15, 7 and 16 years teaching experience. The control group teachers had 12, 20 and 22 years teaching experience. All of the teachers held a Masters degree except the teacher in the experimental group with seven years teaching experience; he held a Bachelor's degree. The total combined years teaching of the experimental group teachers was 28 as compared to 54 years teaching experience of the control group teachers.

Instrumentation

Three instruments were utilized in this study: The Guglielmino Self-Directed Learning Readiness Scale, the Self-Regulated Learning Interview Schedule, and the Self-Directing Perceptual Scale.

Instrument #1

The Guglielmino Self-Directed Learning Readiness Scale (SDLRS) is a self-report instrument consisting of 58 items which assesses "learning preferences and attitudes toward learning." (See Appendix A, p. 116). Fourteen authorities in the area of self-directed learning participated in a

Delphi study which resulted in the development of the SDLRS. The SDLRS has been used in more than 35 doctoral dissertations. Guglielmino reports a reliability coefficient of .88 (via phone conversation January 30, 1992) for the elementary form of the SDLRS. The results of this instrument were correlated with the results of two other instruments: The Zimmerman and Martinez-Pons' Interview Schedule and the Self Directing Perceptual Scale.

Instrument #2

The Zimmerman and Martinez-Pons' (1986) Self-Regulated Learning Interview Schedule (SRLIS) was developed to assess 14 categories of self-directed learning strategies. (See Appendix B.) The strategies were self-evaluation; organizing and transforming; goal-setting and planning; seeking information; keeping records and monitoring; environmental structuring; self-consequences; rehearsing and memorizing; seeking: peer, teachers, or adult assistance; and reviewing: tests, notes, and texts. One category of non-self-directed learning responses (labeled "other") was also included.

Research on Strategies.

The categories identified as self-directed learning strategies by Zimmerman and Martinez-Pons were based upon existing literature. The categories were drawn most heavily from social learning theory and research (e.g., Bandura, 1982; 1986; Schunk, 1984; Thoresen & Mahoney, 1974;

Zimmerman, 1983). These strategies fall into three basic categories, (a) personal functioning, (b) academic behavioral performance, and (c) learning environments. Strategies that focus on optimizing personal regulation include: organizing and transforming (Baird, 1983; Corno & Manadinach, 1983), rehearsing and memorizing (McCombs, 1984; Paris, Newman & Jacobs, 1984), and goal setting and planning (Bandura & Schunk, 1981; Mischel & Patterson, 1978). Strategies that enhance one's academic behavioral performance include: self-evaluating (Bandura & Cervone, 1983, 1986) and self-consequences (Mace & Kratchowill, 1985). The strategies of seeking information (Baird, 1983; Wang, 1983), record keeping and self-monitoring (Spates & Kanfer, 1977), environmental structuring (Thoresen & Mahoney, 1974), seeking social assistance (Zimmerman, 1983), and reviewing academic materials (Wang, 1983) are intended to facilitate the most optimal use of the students' immediate learning environment.

Modifications of Instrument.

Zimmerman and Martinez-Pons' (1986) Self-Regulated Learning Interview Schedule had been used with high school students thereby making some of the wording somewhat advanced for use with fifth-grade students. Alterations were made to adapt the situational contexts described to the student during the interview setting to ones more realistic and meaningful for fifth-grade students. For example, the

first question read: "Assume a teacher is discussing a topic with your class, such as the History of the Civil Rights Movement. He or she says that you will be tested on the topic: Do you have a method to help you learn and remember what was discussed in class?" Instead of the History of the Civil Rights Movement, the Civil War was chosen as a topic which would be more appropriate for fifth graders.

In asking the follow-up questions, part A remains the same. Part B in the follow-up is adapted to read, "What if you are really having trouble? Then what do you do that helps you?" Following a structured adaptation of the original interview schedule should have resulted in a more easily understood and therefore more valid interview.

Derivation of Individual Score.

The Zimmerman and Martinez-Pons' Self-Regulated Learning Interview Schedule was originally constructed to determine if there was a difference in strategy usage of high and low achievers (see Appendix F, p. 142). In the Zimmerman and Martinez-Pons' (1986) study, students' responses were scored separately for each learning context. For the present study a composite score for each individual was derived based upon data produced in the construct validation study conducted by Zimmerman and Martinez-Pons (1988). A description of the procedure to weight student responses (according to how high achievers performed) is described below. Of the 14 learning strategies: organizing and transforming, seeking

information, rehearsing and memorizing and seeking peer assistance were significant at the .01 level in the validation study. These strategies were weighted by the numeral 3. Strategies at the .05 level (keeping records and monitoring, self-consequences, seeking adult assistance, reviewing tests and reviewing texts) were weighted by the numeral 2 and strategies not reaching significance (self-evaluation, goal setting and planning, environmental structuring, seeking teacher assistance, and reviewing notes) were not weighted (based on the construct validation study; Zimmerman & Pons, 1988).

The procedure for deriving a composite score for each student was as follows: the results of the Zimmerman and Martinez-Pons' Interview Schedule were recorded on the Individual Interview Response Form. The information includes: (a) the specific things students do when studying (and in the other five contexts) and, (b) the frequency with which they do them. The frequency was derived by asking the students to name the frequency with which they used each strategy from seldom(1) to most of the time(4). One of the 15 self-directed learning categories was assigned to each of the student's responses. The frequency with which each strategy was used was recorded. The frequencies were then added together to reflect the usage of each separate strategy. These individual strategy summed frequencies were weighted according to the procedure detailed above (.01

weighted by 3, .05 weighted by 2). The frequencies summed were multiplied times the weight. Then the sums times the weights were added to one total composite score. This composite score reflected the strategies used, the frequency with which each strategy was used, and the weight assigned according to strategies which high achievers used most (Zimmerman & Martinez-Pons, 1986).

While Guglielmino's SDLRS is a widely used instrument and has been used for identifying readiness in self-directed learners and the Zimmerman and Martinez-Pons' Interview focuses effectively on learning strategies, both are limited in dealing with the inner workings of students' minds. The Self-Directing Perceptual Scale has been constructed to fill this present void in self-directed measurement. A growing body of theoretical literature is available (Bandura, 1989; Glasser, 1984; Schunk, 1990; Bradley, 1991) to support the percepts and concepts included therein.

Instrument #3

The Self-Directing Perceptual Scale is a 132 item Likert Scale (See Appendix C, p. 129). Theoretical literature (Glasser, 1984; Bradley, 1991; Bandura, 1989; Schunk, 1990; Purkey, 1978) served as the basis for the construction of this instrument. The Self-Directing Perceptual Scale was utilized to identify the self-perceptions of fifth-grade students. The students were asked to respond in one of five ways to each of the items:

(a) never, (b) seldom, (c) occasionally, (d) frequently, or (e) most of the time. The survey was scored on a five-point Likert Scale. Each response was assigned a numerical value. Never, seldom, occasionally, frequently and most of the time were assigned the values of 1, 2, 3, 4 and 5, respectively. A high score was interpreted as indicative of a person who perceives himself or herself as self-directive. The Self-Directing Perceptual Scale was administered as a pre-test posttest measurement.

Since a valid instrument is construed as reliable, many researchers (Best, 1977; Johnson, 1977; Kerlinger, 1986) agree that the most important concern of a questionnaire is the validity. Good (1966), another noted researcher, does not press the need of reliability for a questionnaire for the most part. Scales, rating charts and statements like these on the proposed SDP scale fit the same category. Therefore, establishing the validity of the Self-Directing Perceptual Scale was of primary concern to this researcher. The procedures for establishing validity and preliminary procedures for establishing reliability are described below.

Validation Procedures of the Self-Directing Perceptual Scale.

The items on the original perceptual scale, submitted to this researcher's doctoral committee, were cooperatively selected, compiled, and revised by Ms. Lane and her major professor, Dr. R.C. Bradley (University of North Texas).

These items were then revised following suggestions made during the oral defense.

With guidance from said committee, several preliminary field tests were made on the instrument. On November 8, 1991, Dr. Robert Bane (University of North Texas) suggested that the instrument be "tried" on fifth graders so that the researcher could be certain that the instrument communicated clearly to that age level.

On November 11, 1991, the instrument was taken to two fifth-grade classrooms. In one classroom the items were individually read to the students and they were asked to raise their hands if they didn't understand what the statement meant. In those instances--the item was discussed and several notes were taken reflecting the students' concerns. On several items the children were able to reword the items themselves which ensured more accurate readability for their peers.

In the other fifth-grade classroom, six children were asked to read one page of the perceptual scale and identify any words they didn't understand. They reported that generally, there were no problems. Some students did ask about individual words and those comments were recorded. These results were compared to those of the other fifth-grade classroom and revisions were made on items which were unclear to certain students.

On November 1, 1991 that same draft (see Appendix G, p. 148), reflecting the students concerns was submitted to Dr. Ray Johnson (University of North Texas) and Dr. Janet Black (University of North Texas). On November 20, 1992 further considerations were woven into the document as a result of input by Dr. Black and Dr. Johnson. At this point, the items were placed into several over-riding categories. (This categorizing process was repeated and rechecked in June of 1992 to see that items were placed on their proper headings.)

The revised instrument was taken to an experienced teacher, Mrs. Sylvia Nichols, so that she could ascertain as to whether or not the instrument was worded appropriately for fifth graders, dealt with pertinent content for fifth graders, and was generally worthy of fifth-graders time and attention. Mrs. Nichols has been teaching 17 years in public schools, spending the majority of her time in the intermediate grade classrooms (5th- and 6th-grades). She presently holds a Master's Degree. The instrument was also taken to a group of third-graders at the request of Dr. Johnson to see if they could read and understand the items. Six of Mrs. Chaney's third graders at Woodrow Wilson Elementary, Denton, Texas read the instrument. They were asked to place a check by each item they understood or an X by any item that they did not understand. The students' responses were tallied. Any item receiving an X by

two-thirds of the group was to be revised. No items fell in this category. One item was marked with an X by three of the six students and eleven items were marked with an X by two of the students. No items required revision as a result of this procedure but the researcher was more confident of the ability of fifth graders to read and understand the instrument.

The instrument (see Appendix G, p. 148) was then sent to the jury of panel members (see Appendix H, p. 156). The panel members were three university professors, Dr. James L. Doud (University of Iowa), Dr. Don Fuhr (Clemson University), and Dr. Garry Landreth (University of North Texas), and two classroom teachers, Ms. Lou Ann Jackson (Plano, Texas ISD) and Mrs. Grace Vaughan (retired teacher, Denton, Texas ISD).

Each of these individuals was asked to judge each item on the Self-Directing Perceptual Scale as to its appropriateness for fifth graders by placing each item into one of four categories: inappropriate item, revise item, appropriate item, and highly appropriate item. Upon receiving the results from these five people, final revisions were made on the Self-Directing Perceptual Scale. The following procedures were followed in deciding which items were to be revised or omitted from the instrument.

If two or more of the respondents believed an item to be inappropriate, the item was omitted from the instrument

completely. No items received more than one "inappropriate" marking. (Only 11 items received one mark in the "inappropriate" category. Therefore, no items were eliminated from the instrument.)

Revisions were made on items in which two or more respondents checked the "revise item" category. This occurred for items #1, #5, #61 and #91 (these numbers reflect the items on the instrument in the overriding categories prior to scrambling the items). Two items (#94 and #30) were revised by the researcher.

One additional measure was taken on December 4, 1991. An outstanding principal at Colleyville Middle School, Dr. Paul Jennings, was asked to peruse the final draft of the instrument. He viewed the work as to its eligibility for its direct administration to public school students. His hearty approval was expressed.

On December 5, 1991, the wording of several of the items was changed so that all of the statements would <u>not</u> be phrased in a way which would consistently result in a "most of the time" answer. This procedure was followed to reduce the redundancy of the students' responses.

The order in which the items appeared were systematically organized so that the items of each category were not adjacent to one another. Additionally, easier items were placed at the beginning of the instrument to ease

students into the test setting in a psychological sense. A copy of the final draft is in Appendix C (see p. 129).

Reliability Procedures for the Self-Directing Perceptual Scale.

Following the revisions suggested by the panel members the instrument underwent test-retest procedures at two elementary schools. Children were required to have parental permission to take the Perceptual test. Therefore, permission slips were collected by the cooperating classroom teachers at Camey Elementary in The Colony, Texas and at Timberline Elementary, Colleyville, Texas. The students from Timberline Elementary returned their permission slips to the classroom teachers and were kept on file by the researcher. Only those students receiving written permission, by their parents or guardian, were allowed to take the test. The scale was administered resulting in 13 completed student tests, that were acceptable for analyzing statistically for the purposes of this study, from Camey Elementary in The Colony, Texas and 69 usable tests from the fifth-grade students at Timberline Elementary in Colleyville, Texas.

At Camey Elementary, the Perceptual Scale was given on December 15, 1992 and the retest was administered on January 13, 1992. At Timberline Elementary, the Perceptual Scale was given on February 17, 1992 and the retest was given on March 2, 1992.

A chi-square was applied to each item of the Perceptual Scale resulting in a reliability of $p<.01$ for the majority (79%) of the test items. An additional twelve items (9%) were found to be reliable at the .02 level with only 18 items (14%) being excluded from statistical analysis in the present research. The items that were excluded from the statistical analysis were items: 4, 5, 14, 19, 20, 29, 36, 39, 40, 41, 47, 80, 84, 105, 106, 117, 118, 131. (Please see Appendix I [p. 159] for information concerning the applicability of the use of SDPS in an actual school setting.)

Prior to Treatment

Three pre-tests were administered prior to treatment. The experimental groups and the control groups were interviewed using the Zimmerman and Martinez-Pons' Interview Schedule and given the Self-Directing Perceptual Scale. Only the experimental group was given the Guglielmino SDLRS prior to treatment (see Appendix L, p. 174 for student's raw scores on each instrument). Due to the time involved in interviewing approximately 150 fifth-grade students, assistance was recruited for data gathering purposes. A teacher-education graduate from the University of North Texas was employed to conduct the Zimmerman and Martinez-Pons' Interview with the control group. The researcher explained the interview protocol to the assistant and demonstrated the procedure with several fifth graders.

The control group responses were inspected to ensure that their responses were similar in type to the responses that the researcher was receiving from the experimental group. Interview sessions were audio-taped to ensure accuracy in data collection. The interview responses were categorized by one coder to ensure consistency in this process.

Experimental Treatment

During the second week in March a one-hour workshop was given for the experimental group teachers. In this workshop the organizational scheme of the teaching materials, the teacher's role as a facilitator and an overview of the background of the study were given.

Session II which dealt with Control Theory principles and Session III which focused on motivation, goals and management and control ideas were held in an informal manner privately with each teacher during their planning periods.

Weekly visits were made to each school by the researcher to answer questions, look at student notebooks and assist the teacher in understanding and or implementing the treatment. For example, Teacher A was uncomfortable with Activity 2B Mapping so the researcher conducted this series of activities with that class so the teacher could observe what was expected.

Treatment for the experimental groups which were located on three different campuses began on March 12, 1992 and was completed on May 20, 1992. The length of treatment

was seven and one-half weeks. Six days of district-wide testing occurred on April 7-9 and April 14-16.

Two major facets of the treatment were emphasized in this study: perceptual skills and learning strategies. The perceptual aspect of this work dealt with exposing students to dynamic concepts based on Control Theory. Class discussions were held by the classroom teacher and several small group sessions were conducted by the researcher. A booklet entitled: A Personal Guide To My Own Thought Processes (written by the investigator of this project) was used as the framework of these discussions and was distributed to each of the experimental students.

Three elements originally comprised the learning strategy emphasis of the study: a Teacher Activity Booklet, "Toward Inspiring Self-Directed Learning"; a Student Workbook, directly related to the teacher activity booklet; and a workshop: "Teaching for Student Self-Direction." Along with the preceding material, the teachers also received a copy of Dr. R.C. Bradley's (1991) book, Teaching for Self-Directed Living and Learning in Students. This book was most valuable as it served as a basis for private discussions between the researcher and the classroom teachers throughout the experiment.

The researcher used fifteen learning strategy categories (see p. 122) from Zimmerman and Martinez-Pons (1986) as the framework from which the learning strategy

treatment was built (see Appendix O, p. 185 for a partial list of strategies used in this study). The fifteen categories consisted of: self-evaluation, organizing and transforming, goal setting and planning, seeking information, keeping records, and monitoring, environmental structuring, self-consequences, rehearsing and memorizing, seeking peer assistance, teacher assistance and adult assistance and reviewing tests, notes and texts. Of the last seven categories, six were condensed into two broader areas: seeking peer assistance, seeking teacher assistance and seeking adult assistance were condensed, for training purposes, into seeking assistance. Reviewing tests (category 12), reviewing notes (category 13) and reviewing texts (category 14) were condensed into reviewing. The last category of the Zimmerman and Martinez-Pons' classification was "other," so no training was designed to increase skills that might fall into that category.

For each of the aforementioned categories, several activities or discussions were organized to comprise the Teacher Activity Booklet. Each student received a Student Workbook for documentation purposes. These workbooks were directly related to the Teacher Activity Booklet and each were organized based upon Zimmerman and Martinez-Pons' (1986) work as mentioned above.

Approximately three weeks into the study the investigator's booklet entitled "Penetrating the Darkness"

was introduced for clarification and motivational purposes. Its contents were geared to more vividly communicate concepts such as visual imagery and mnemonics as memory aids. This booklet was earlier designed to further clarify some key learning strategies that could likely yield additional reinforcement for study and review purposes.

Post testing began on May 21, 1992 for the experimental groups and May 26 for the control group. All posttests were completed by June 3, 1992. The Self-Directing Perceptual Scale and the Zimmerman and Martinez-Pons' Interview were the instruments used as posttest measurements for the experimental and control groups.

Procedures for Administering Instruments

Administering the Guglielmino SDLRS

The Guglielmino Self-Directed Learning Readiness Scale was administered as a pre-test measurement to the experimental groups only. Directions for administration were adhered to closely. Tests were checked for accuracy of completion and sent to Guglielmino and Associates for scoring. The results of this process were used in testing hypotheses 5 and 6. The Guglielmino SDLRS was also used as the covariate in hypothesis 4.

At the conclusion of the data collection phase, experimental and control group students' IQ scores were retrieved from students' cumulative records. Findings based

upon a select number of these scores are found in Chapter V, Hypothesis 1. (Also see Appendix J, p. 164.)

Administering the Zimmerman and Martinez-Pons' Interview Schedule

The Zimmerman and Martinez-Pons' Interview Schedule contains six different learning contexts. These contexts were described to each student. The contexts include: in classroom situations, when studying at home, when completing written assignments, when completing mathematics assignments, when preparing for and taking tests, and when poorly motivated to complete homework. (These contexts are presented in Appendix B, p. 121). For each learning context, students were asked to indicate the methods that they used to accomplish the task at hand. If the student failed to offer an answer he or she was asked, "What if you are having difficulty? Is there any particular method you use?" If the student still failed to suggest andy self-directed learning strategies, questioning was discontinued for that learning context. If the student mentioned one or more strategies, the interviewer asked him or her to rate the consistency with which each strategy was used according to a visually presented four-point scale with categories ranging from seldom (1) to most of the time (4). This same questioning strategy was used with the experimental and control groups as a pre- and posttest measure.

During the Zimmerman and Martinez-Pons' interviews, the following procedures were used to assist the interviewer in establishing rapport with the students and to ensure the same interview format.

During the data collection phase the following procedures were used:

1. As the interviewer met the student she addressed the student by name and explained the purpose of the interview.

2. The interviewer spent a few minutes asking the student about special interest or favorite past-times.

3. The students were assured that there were no "correct" answers to the questions and that indeed some of the strategies they may use may be used in more than one context.

The results of the Zimmerman and Martinez-Pons' Interview Schedule were partially hand scored and partially computer scored. These results were checked several times for completion and accuracy. If for some reason a frequency (1-4) was not listed on the interview form, to indicate how often a person used a certain mentioned strategy, then a "1" was assigned for the frequency so that the strategy and frequency could be included for scoring purposes. A "1" was assigned because if a person mentioned a strategy one could be confident that they used the strategy at least seldom, if not more often. The same procedure was used for

experimental and control group students. Every response was hand-coded into a category by the researcher. These data sheets were submitted to data entry. Due to the nature of the responses, the data was entered by hand; therefore, an additional check was made of the computer printout to ensure that every frequency had a category and that no mistakes were made in entering the data. Corrections were made to ensure the accuracy and completeness of the data entered.

A computer program was written to score the interviews as described above. Six randomly chosen interviews were hand-scored to ensure the accuracy of the newly written program. The results of the Zimmerman and Martinez-Pons' Interview were used in testing hypotheses 1, 2, 5, 7, and 8.

Administering Self-Directing Perceptual Scale

Upon giving the Self-Directing Perceptual Scale, the students were requested to check their data sheets for completion and clarity. As the papers were collected, a quick but accurate perusal was given each test for its completion. (Students were asked to provide missing information as needed.) Prior to submitting the data, another check was made to erase stray marks, and to bubble in answer sheets that were too light. If, after these procedures, an answer was missing, then the number 0 was assigned to that question so that the answer sheets could still be used in the analysis. The questionnaires were then programmed and analyzed by computer using the Statistical

Package for Social Science (Norusis, 1990) at the University of North Texas. The results of this process were used in testing Hypotheses 3, 4, 6, 7, and 8.

Analysis of Data

Hypotheses 1 and 3 were analyzed using a nested ANOVA. The experimental and control groups were compared to see if statistical significance at $p<.05$ level would be reached on the Zimmerman and Martinez-Pons' Interview (for Hypothesis 1) and the Perceptual Scale (for Hypothesis 3).

Hypotheses 2 and 4 were analyzed using ANCOVA. Each of these hypotheses was concerned with the experimental group only and compares the difference between girls and boys responses to the Interview and Perceptual Scale respectively. For Hypothesis 2, the pre-test was used as the covariate and the posttest was the dependent variable. For Hypothesis 4, the Guglielmino SDLRS was used as the covariate and the girls' and boys' pre- to posttest scores were compared. The level of significance $p<.05$ was set for each of these hypotheses.

Hypotheses 5, 6, 7, and 8 were analyzed using the Pearson Product Moment Correlation Coefficient. A significant correlation of $p<.05$ was set for each of these hypotheses.

Summary

In Chapter III, a detailed description of each aspect of the study was given. The general design and sample for

this study was described, the instruments were presented and the sequence of events from gaining entry to conducting the posttests were articulated. A preview of the analysis of data, to be described in Chapter IV, was also provided.

In Chapter IV the results from the Zimmerman and Martinez-Pons' Interview Schedule will be tested for correlation with the Self-Directing Perceptual Scale and the Guglielmino SDLRS. Also the results from the Guglielmino SDLRS will be tested for correlation with the Perceptual Scale. The score on the Guglielmino scale will be used as a covariate in one of the hypothesis dealing with gender. But most importantly, the experimental and control groups will be compared for significant differences in acquirement of learning strategies and adoption of self-directing perceptions.

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CHAPTER IV

ANALYSIS OF DATA AND SPECIFIC FINDINGS

The organization of this current investigation is as follows: included in Chapter I was the background, significance of the study, general statement of the problem, purpose, statement of hypotheses and definitions of terms used in this study. The research specifically related to this study was presented in Chapter II. Chapter III contained research methodology and procedures followed in the collection of data. The focus of this chapter is the analysis of data and specific findings related to each of the hypotheses.

Major Purpose of the Investigation

This investigation is to ascertain if children's perceptions of their role in learning can be enhanced to produce greater use of the self-directed learning strategies presented in this study.

Specifically, answers to the following questions were sought.

Question 1

Is there a significant difference between the scores of students who receive training in self-directed learning strategies and perceptual skills and those who did not? In

order to answer question one, the following hypotheses were formulated:

1. There will be no significant difference between the posttest scores of the groups which received no training in learning strategies as measured by Zimmerman and Martinez-Pons' Self-Regulated Learning Interview Schedule and the posttest scores of the groups which received training.

3. There will be no statistically significant difference between the posttest scores of the groups which received no training in perceptual skills as measured by the Self-Directing Perceptual Scale and the posttest scores of the groups which received training.

Question 2

Is there a significant correlation between students' use of perceptual skills and self-directing learning strategies as related to their level of readiness to self-direct?

5. There will be no significant correlation for the experimental group between individuals' pre-test scores reflecting readiness to self-direct, as identified from Guglielmino Self-Directed Learning Readiness Scale and individuals' pre-test scores reflecting use of self-directed learning strategies, as identified from the Zimmerman and Martinez-Pons' Self-Regulated Learning Interview Schedule.

6. There will be no significant correlation for the experimental group between individuals' pre-test scores reflecting readiness to self-direct, as identified from Guglielmino Self-Directing Readiness Scale and individuals' pre-test scores reflecting students' perceptual skills on the Self-Directing Perceptual Scale.

Question 3

What difference, if any, is there between boys' and girls' use of perceptual skills and learning strategies?

2. There will be no significant difference between the girls' and boys' mean posttest scores on the Zimmerman and Martinez-Pons' Self-Regulated Learning Interview Schedule for the experimental group when the scores have been adjusted to account for the effects of the pre-test scores.

4. There will be no significant difference between the boys' and girls' mean pre- and posttest scores on the Self-Directing Perceptual Scale when the scores have been adjusted to account for the effects of the Guglielmino Self-Directed Learning Readiness Scale.

Question 4

Is there a correlation between students' use of perceptual skills and their use of learning strategies?

7. There will be a significant correlation between the experimental groups' individual student's posttest scores on the Self-Directing Perceptual Scale and the experimental

groups' individual posttest scores on the Zimmerman and Martinez-Pons' Interview Schedule.

8. There will be a significant correlation between the control groups' individual student's posttest scores on the Self-Directing Perceptual Scale and the control groups' individual posttest scores on the Zimmerman and Martinez-Pons' Interview Schedule.

Analysis of Data

The first four hypotheses to be analyzed dealt with either learning strategies (Hypotheses 1 and 2) or perceptual skills (Hypotheses 3 and 4). Hypotheses 1 and 3 were analyzed using ANOVA in a nested design. These two hypotheses deal with a comparison of the experimental and control groups' scores on the learning strategy interview schedule and the perceptual strategy scale respectively. Hypothesis 2 was analyzed using ANCOVA to test differences due to gender on the learning strategies interview schedule while the pre-test score was used as the covariate. Hypothesis 4 was analyzed using ANCOVA to test for differences in gender on the perceptual scale with the Guglielmino as the covariate. Hypotheses 2 and 4 deal exclusively with the experimental groups.

Lastly, four Pearson Product Correlation Coefficients were calculated for Hypotheses 5, 6, 7 and 8 to measure different relationships among the scores on the following

instruments: the Guglielmino SDLRS, the Perceptual Scale, and the Zimmerman and Martinez-Pons' Interview.

Hypothesis 1

In order to study the differences between groups which received training in self-directed learning strategies and groups which received no training, a nested ANOVA was employed. The dependent variable was the posttest score on the Zimmerman and Martinez-Pons' Interview and the independent variable was the treatment. (A *t* test which is typically appropriate for a comparison of two groups was not used to analyze this hypothesis because a *t* test is not accessible in the nested design). The *F* test can be used as Kachigan (1986, p. 276) states, when one is "interested in evaluating whether two or more sample means differ more than would be expected by chance."

Hypothesis 1 states: There will be no significant difference between the posttest scores of the groups which received no training in learning strategies as measured by Zimmerman and Martinez-Pons' Self-Regulated Learning Interview Schedule and the posttest scores of the groups which received training. The $p<.05$ level of significance was set for this hypothesis. The results of the ANOVA are presented in Table 1, (page 74).

Since the obtained *F* value of 77.02 exceeds $p<.01$ by a considerable margin, indicating the differences is "highly significant," a significance beyond the .01 level, the null

hypothesis was rejected with great confidence. This means that there was a significant difference in the learning strategy score of children who received treatment as compared to the score of those who did not receive treatment.

Table 1

Computed F Values Reflecting Gains in Learning Strategies Between the Experimental and Control Groups

	Source	SS	df	ms	F
A	Instruction	531591.56	1	531591.56	77.02*
B(A)	Classrooms	45321.99	4	11330.50	1.64
W	Cell	1007754.76	146	6902.43	
	Total	1584668.21	151		

Note. A means instruction; B(A) means the classroom is nested within the instruction; W Cell means within cell.

Critical values A: .10, 2.75; .05, 3.92; .01, 6.85; .001, 11.38

Critical values B(A): .10, 1.99; .05, 2.45; .01, 3.45; .001, 4.95

*p<.001

A serendipitous finding in running a nested design is the comparison among the classes within the groups noted above as "classroom." There were no significant differences

in strategy usage among the classrooms within the control group, nor were there significant differences in strategy usage among the classrooms within the experimental group. This means that within the experimental groups the mean scores of the three subgroups were not significantly different; nor were the three subgroups of the control group significantly different from one another within that group. The major finding was the significant difference between the two groups, experimental and control. The serendipitous finding (classrooms) is only a statement of the lack of variability among the three separate groups in the control group and among the three classrooms in the experimental groups. This finding is verified by comparing mean strategy usage of a limited number of students matched on IQ (See Appendix J, p. 164).

Hypothesis 2

To discover if gender would help predict students use of learning strategies over and above the students pre-test scores on the Zimmerman and Martinez-Pons' SRLIS, and analysis of covariance was utilized.

Hypothesis 2 states: There will be no significant difference between the girls' and boys' mean posttest scores on the Zimmerman and Martinez-Pons' Self-Regulated Learning Interview Schedule for the experimental group when the scores have been adjusted to account for the effects of the pre-test scores. In this analysis, which involved the

experimental group only, the dependent variable was the Zimmerman and Martinez-Pons' Interview. The test for homogeneity of regression slopes indicated that the assumption of equal regression slopes was tenable, thus permitting the use of the conventional analysis of covariance. The results of the ANCOVA procedure are presented in Table 2.

Table 2

Computed F Values Reflecting Gains in Learning Strategies Between the Experimental and Control Groups

Source	SS	df	ms	F
Gender	907.397	1	907.397	.116
Residual	564072.208	72	7834.336	
Total	564979.605	73		

Note. Pre-test on Zimmerman and Martinez-Pons was the covariate factor. Critical values: .10, 2.79; .05, 4.00; .01, 7.08; .001, 11.97

The obtained difference of 907.397 measured in terms of learning strategies by gender and expressed as an F ratio of .116 falls short of the 4.00; hence, the obtained difference must be regarded as representing merely a chance deviation from the true difference of zero. Therefore, the null hypothesis was accepted. This means that the skills presented in this study were of a nature which were acquirable by each gender.

Hypothesis 3

To determine if there was a significant difference between the experimental groups and the control groups' scores on the Self-Directing Perceptual Scale after treatment, an analysis of variance was calculated. The dependent variable was the posttest score on the Perceptual Scale and the independent variable was the treatment. As in Hypothesis 1 an analysis of variance (F test) was used in the nested design to compare means (based on raw scores) of the experimental and control groups.

Table 3

Computed F Values Reflecting Gains in Perceptual Skills Between the Experimental and Control Groups

Source	SS	df	ms	F
A Instruction	408.02	1	408.02	.14
B(A) Classrooms	7794.39	4	1948.60	.66
W Cell	428754.59	146	2936.68	
Total	436957.00	151		

Critical values A: .10, 2.75; .05, 3.92; .01, 6.85; .001, 11.38

Critical values B(A): .10, 1.99; .05, 2.45; .01, 3.48; .001, 4.95

Hypothesis 3 states: There will be no statistically significant difference between the posttest scores of the groups which received no training in perceptual skills as

measured by the Self-Directing Perceptual Scale and the posttest scores of the groups which received training. Once again, the $p<.05$ level of significance was set for this hypothesis. The results of the ANOVA are presented in Table 3.

The $p<.05$ level of significance (3.92) was set for this hypothesis and was not attained with the .14 F ratio. Therefore, the null hypothesis is retained. In other words, when comparing the experimental and control groups posttest scores on the Perceptual Scale, there were no significant differences. Also, when examining the classrooms within the control and within the experimental groups (F = .66, df 4, 146, $p>.05$ = 2.45) there were no significant differences among the classes within each respective group on the Perceptual Scale.

Hypothesis 4

To determine if gender will help predict success in acquiring self-directing perceptual strategies over and above a student's score on the Guglielmino Self-Directed Learning Readiness Scale (SDLRS), an analysis of covariance was calculated between the girls and boys (pre- to posttest scores) on the Self-Directing Perceptual Scale (SDPS) from the experimental group. The ANCOVA procedure is believed by Kachigan (1986, p. 338) to be "ideal" to use with in-tact groups when studying the relationships among these three variables: covariate, dependent and independent. The dependent variable was the pre- to posttest score on the

Perceptual Scale; the independent variable was gender and the covariate was the Guglielmino SDLRS. (A relationship between the dependent variable and the covariate was established in testing Hypothesis 6.) An analysis of covariance using sequential sums of squares was used to test this hypothesis because the researcher was interested in discovering if there was a significant difference in boys' and girls' pre- to posttest scores (on the Perceptual Scale) after the difference on the Guglielmino SDLRS had been taken into consideration.

Hypothesis 4 states: There will be no significant difference between the boys' and girls' mean pre- and posttest scores on the Self-Directing Perceptual Scale when the scores have been adjusted to account for the effects of the Guglielmino Self-Directed Learning Readiness Scale. The results of the ancova using sequential sums of squares are presented in Table 4, (page 80).

The obtained difference of 3161.46 measured in terms of perceptual strategies by gender and expressed as an F ratio of 1.05 falls short of the 4.00 table value; hence the obtained F value (df 1,73) does not reach the $p<.05$ level of significance. Therefore, the null hypothesis is retained. This means that the girls and boys in this study did not surpass one another in acquired self-directing perceptual strategies.

From the sequential sums of squares procedure, two

serendipitous findings were noted. A highly significant difference was found ($p<.003$) on the Perceptual Scale between the pre- and posttest scores of the experimental group when the concomitant variable (score on the Guglielmino SDLRS) was held constant. This means that the treatment did make a substantial difference in the perceptual strategies used by the experimental group youngsters. This finding is important because it verifies the contention that students can be taught perceptual strategies.

Table 4

Ancova Using Sequential Sums of Squares for Factors on the Perceptual Scale

Factor	SS	df	MS	F	Sig of F
(1) Gender	3161.46	1	3161.46	1.05	.309
(2) Test (pre- & post-)	6626.73	1	6626.73	9.16	.003*
(3) Gender by Test	490.46	1	490.46	.68	.413

Note. Due to the complexity of the information derived from this statistical procedures, the critical information in this table was taken from two separate computerized tables. Therefore, the typical interrelations in an ancova analysis are not present.

* $p<.003$

The second serendipitous finding concerns whether or not there was a significant difference when we consider both treatment and gender together. In other words, when comparing the means of the four different groups: namely, the mean of the boys' pre-test, the mean of the boys' posttest, the mean of the girls' pre-test, and the mean of the girls' posttest; is there a significant difference among any of the four scores? The F ratio for the factor is .68 which is statistically insignificant. This means that there was not a signficant difference among the four means when considering both gender and test.

The remaining four hypotheses in this study deal with the relationship between different measurable entities. The relationship between these entities was measured using a Pearson Product Correlation Coefficient. This correlation coefficient was used to analyze Hypotheses 5, 6, 7 and 8 because the instruments used in each of these hypotheses produce interval data. These hypotheses will be discussed in Table 5. Table 5 contains the respective correlations for the following hypotheses.

Hypothesis 5

In order to study the relationship between readiness to self-direct and students' use of self-directing learning strategies, a Pearson Product Correlation Coefficient was calculated using pre-test data on each instrument (the Zimmerman and Martinez-Pons' Interview Schedule, and the

Guglielmino SDLRS). Hypothesis 5 states: There will be no significant correlation for the experimental group between individuals' pre-test scores reflecting readiness to self-direct, as identified from Guglielmino Self-Directed Learning Readiness Scale and individuals' pre-test scores reflecting use of self-directed learning strategies, as identified from the Zimmerman and Martinez-Pons' Self-Regulated Learning Interview Schedule. A correlation coefficient of .16 was calculated. This coefficient did not approach the required table value of .232 at $p<.05$, hence, the null hypothesis was accepted. This means there was not a significant relationship (positive or negative) between the experimental groups readiness to self-direct and their use of self-directing learning strategies.

Initial interest in testing this relationship was to determine whether or not the Guglielmino SDLRS could be used as the covariate in Hypothesis 2. Due to the lack of correlation discovered between the Guglielmino SDLRS and the Zimmerman and Martinez-Pons' Interview Schedule, the Guglielmino SDLRS was not used as the covariate in Hypothesis 2.

Hypothesis 6

To measure the relationship between readiness to self-direct and students use of self-directing perceptions, a Pearson Product Correlation Coefficient was calculated using pre-test measurements. Hypothesis 6 states: There

will be no significant correlation for the experimental group between individuals' pre-test scores reflecting readiness to self-direct, as identified from Guglielmino Self-Directing Readiness Scale and individuals' pre-test scores reflecting students' perceptual skills on the Self-Directing Perceptual Scale. The critical values (Thomas, p. 209) for a two-tailed test (df = 73) is .232 at the $p<.05$ level of significance. Therefore, the obtained level of .69 exceeds the .232 table value. The obtained difference must be regarded as more than chance deviation from zero.

Table 5

Coefficients of Correlation Between Selected Measurements of Fifth-Grade Students

Hypothesis	Tests	Pre/Post	Group	df	r
Hyp. 5	Guglielmino	pre-test	exp.	73	.16
n = 75	Zimmerman & Pons	pre-test			
Hyp. 6	Guglielmino	pre-test	exp.	73	.69*
n = 75	Perceptual	pre-test			
Hyp. 7	Zimmerman/Pons	posttest	exp.	73	.13
n = 75	Perceptual	posttest			
Hyp. 8	Zimmerman & Pons	posttest	control	75	.20
n = 77	Perceptual	posttest			

Note. Critical values for two-tailed tests (df = 73) are: .10, .195; .05, .232; .02, .274; .001, .303.

* $p<.01$ level.

According to Guilford's descriptive labels for interpreting coefficients of correlation as cited in Williams (1986, p. 132), a "substantial or moderate correlation" exists between the score of the Self-Directing Perceptual Scale and the Guglielmino SDLRS. Therefore, the null hypothesis was rejected in favor of the research hypothesis. This means that there was a positive relationship between the experimental group students readiness to self-direct and their self-directing perceptual abilities prior to treatment.

The purpose of testing this hypothesis was to determine if the Guglielmino could be used as the covariate in Hypothesis 4. With these results, the students scores on the Guglielmino were used as said covariate.

Hypothesis 7

To determine if a relationship existed after treatment between the students' use of self-directed learning strategies and the students' use of self-directing perceptions, a Pearson Product Correlation Coefficient was calculated for the experimental group only.

Hypothesis 7 states: There will be a significant correlation between the experimental groups' individual student's posttest scores on the Self-Directing Perceptual Scale and the experimental groups' individual posttest score on the Zimmerman and Martinez-Pons' Interview Schedule.

The correlation calculated to measure the relationship between these two variables, r = .13, failed to reach the $p<.05$ level of significance, as the critical value (Thomas, p. 209) for a two-tailed test (df = 73) is .232 at the $p<.05$ level of significance. Therefore, the research hypothesis is rejected and the null hypothesis accepted. One can be certain that a significant positive or negative correlation between the experimental group students' use of learning strategies and their personal self-directing perceptions did not exist in this study.

Hypothesis 8

To determine if a relationship naturally existed between students' self-directing perceptual skills and their use of learning strategies, a Pearson Product Correlation Coefficient was calculated for the control group. Hypothesis 8 states: There will be a significant correlation between the control group's individual students' posttest scores on the Self-Directing Perceptual Scale and the control groups' individual students' posttest scores on the Zimmerman and Martinez-Pons' SRLIS.

The correlation of .20 failed to reach the critical value of .232 for a two-tailed correlation at $p<.05$ level of significance. Therefore, the research hypothesis was rejected in favor of the null hypothesis. According to Guilford's (1956) the magnitude of the correlations was "slight, almost negligible" (cited in Williams, 1986,

p. 132) when comparing the control group students' self-directing perceptual skills and their use of learning strategies.

Summary

In this chapter the major research questions were stated with the corresponding hypotheses. For each hypothesis the data were analyzed and the major finding was stated. Chapter V will address the conclusions and implications for each of the hypotheses as well as a section of Selected Findings with their related conclusions and educational implications. Lastly, a summary and recommendations for further study are given at the conclusion of Chapter V.

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CHAPTER V

SELECTED FINDINGS, CONCLUSIONS AND IMPLICATIONS; PLUS SUMMARY AND RECOMMENDATIONS FOR FURTHER RESEARCH

In this last chapter, Chapter V, specific findings from this research will be discussed with conclusions and educational implications.

Findings

The findings of this investigation are limited to the three schools in which the data were gathered. It is not intended that the findings be generalized to other situations dissimilar to those described in this experiment.

Research Questions

Question #1

Is there a significant difference between the scores of students who received training in self-directed learning strategies and perceptual skills and those who did not?

There is a substantial statistical difference in the scores of students who received training in learning strategies and those who did not. It is apparent that the mean for the experimental group increased 130.43 points from pre- to posttest setting, whereas the mean for the control group decreased 4.3 points. This difference is significant at the .001 level. Clearly the experimental

group completed the training with an increased number of strategies.

With respect to perceptual skills, when comparing the experimental and control groups, a significant difference did not occur. In examining the experimental group only, with a more refined statistical technique (see p. 80), a highly important and significant difference occurred between their pre- and posttest scores ($F = .003$).

This finding is of paramount importance. It speaks to the need in periodical literature for evidence that the perceptions of children can indeed be altered, thus, in many cases, improved.

Question #2

Is there a difference between students' use of perceptual skills and self-directing learning strategies as related to their level of readiness to self-direct?

The finding was a student's readiness to self-direct is highly correlated with one's self-directing perceptual abilities, whereas a student's readiness to self-direct apparently has little impact on one's ability to acquire self-directing learning strategies.

Question #3

What difference, if any, is there between boys' and girls' use of perceptual skills and learning strategies?

Gender appears to have no influence on one's ability to acquire learning strategies or perceptual skills. While

this researcher accepts Epstein's work on brain growth (cited in Sylwester, 1982), in which he points out the dynamic differences in girls and boys during intermediate grade years; apparently, the perceptual skills and learning strategies in this study are not of a nature that limit successful acquisition to one gender or another.

Question #4

Is there a correlation between students' use of perceptual skills and their use of learning strategies?

The finding was: the correlation between the perceptual skills and learning strategies is negligible. Regardless of whether one examines the experimental group ($r = .12$) or the control group ($r = .20$), the correlation between the two is only slight.

Selected Findings

Hypothesis 1

Finding.

In comparing the fifth-grade students' use of learning strategies it was found that an obtained F value of 77.02 was significant at the .001 level, therefore, the null hypothesis was rejected in favor of the research hypothesis. Succinctly put, in comparing the experimental ($n = 75$) and control ($n = 77$) group students, utilizing the Zimmerman and Martinez-Pons' SRLRS, the experimental students acquired significantly more strategies than the control group. In fact, most students evidently doubled the number of

strategies that they had previously acquired. (See Table 1, p. 74.)

Conclusion.

Rejecting the null hypothesis above, it is a tenable conclusion that children who do not have actual teaching of information or data concerning learning strategies will likely never acquire the same repertoire of skills that students acquire when exposed to this critical information in some specific, systematic fashion.

Educational Implication.

Part of teachers' yearly instructional goals and weekly lesson plans ought to include the extent to which they will offer instruction and time to assist children in learning what it is they are teaching them.

1. Teachers should have children keep a record of the learning strategies used weekly.

2. Teachers should be exposed to key learning strategies that can be introduced by the teacher and practiced by the students throughout the year in various subject areas. However, a "connectedness" should be established between and among subjects offered on this daily basis. For example, the student who writes a science paper should be implementing the skills of writing learned in the English (grammar) class.

This finding is in keeping with the findings of the research reported in the national ASCD publication Tools for

Learning (1990) which states that "most students will not learn study skills unless they receive explicit instruction in their use" (p. 3). This present research fills an apparent void, as was evident in the ASCD publication (1990), in the area of research on study skills instruction for elementary age students. While there are numerous studies at the elementary age level (LeGall, Kratzer, Jones & DeCooke, 1990; Fisher, 1979; Idol, 1987; Kauale & Schreiner, 1979) which focus on discrete study skills, relatively few studies (Hoeprich, 1988; Hughes, 1990) have attempted to cover a gamut of skills. The present study has focused upon presenting numerous strategies to fifth-grade students with very positive results.

Zimmerman and Martinez-Pons (1990) have suggested that their triadic model of self-regulation may have merit for training students to become more effective learners. The learning strategies presented in this study were built around this triadic model which included the 14 categories presented in the Zimmerman and Martinez-Pons' work. This present research strongly supports the contention that training in these strategies has profound educational implications for intermediate grade students. Regardless of the intellectual level of the youngster, training in the use of these strategies greatly assisted children in using their powers to the fullest. (See triadic model below.)

Personal Functioning

- organizing and transforming
- rehearsing and memorizing
- goal setting and planning

Academic Behavioral Performance

- self-evaluation
- self-consequences

Learning Environments

- record keeping and self monitoring
- environmental structuring
- seeking social assistance
- reviewing academic material

This current study challenges the myth that "self-directed learning implies learning in isolation." It is a mistake to automatically associate self-directed learning with learning on an independent basis. On the contrary, research evidence in this study supports the view that instructors who assist youngsters in acquiring learning strategies are providing the student with a "fellowship of learning"--unfavorable competition among learners is balanced with a degree of cooperation and sharing. It is a facilitating teacher who takes a few times a week to arrange a setting in which students "exchange how they learn." Traditionally, schools tend to assess only <u>what</u> has been learned (content/facts).

Saracho and Spodek (1981), noted experts on learning styles, have averred that rather than limit a learner's perceptions to a dominant style, "...it would seem that the most appropriate strategy would be to extend the repertoire of each individual beyond the scope of his or her dominant cognitive style" (p. 157). Heretofore, this was not shown as a distinct possibility; but in this present study, it is shown that each student in the experimental group could acquire additional strategies, and be taken beyond his/her dominant style. Each student now has a repertoire of learning strategies from which to draw for future learning purposes.

IQ Information

Finding.

An intriguing finding was noted upon examining learning strategy acquisitions based upon IQ scores. In comparing the average number of learning strategies acquired after treatment, when a select number of students were matched on IQ score, it was found that the experimental group students (low, middle and high IQ levels) scored 40%, 50% and 29% higher respectively, than did the control group students. Furthermore, in the same comparison, the low IQ level students in the experimental group, on average, used 8 more strategies than the high IQ level from the control group (30 and 22 strategies respectively).

Conclusion.

From this finding one can conclude that the intellectual brightness of a student does not ensure acquirement of learning strategies through vicarious and accidental means--procurement of strategies comes through incidental teaching and planned experiences for this purpose directed at all student levels of intellect.

Educational Implication.

Learning strategy instruction should be provided for all students regardless of intellectual level.

1. Teachers should demonstrate notetaking around a centre for all students, discuss the importance of seeing ideas globally, provide written paragraphs or transparencies from which the student may practice the centre skill; and in future lessons expect intermittent application of this strategy during lecture settings designed for this purpose.

2. Teachers may pre-assess their lessons to ensure that all three levels of instruction, facts, thoughts, and values are implemented. For example, in a shared reading experience students should discuss factual information gleaned from the story; they should draw conclusions and make inferences from the information presented, then they should be expected to place value thoughts upon what they read asking, "What does this truly mean to me?"

3. Rather than have students follow the traditional mode of a single strategy to acquire the skills of a given

subject, newer and more creative strategies should be supplied and sought. To illustrate, instead of having children write answers to questions at the end of a lesson, or answer verbally all questions typically offered by the teacher in the lesson setting, teachers might ask students to draw a cartoon sequence depicting an era of history opposed to answering questions at the end of the chapter.

4. Although it is mentioned above that learning strategies should be provided all youngsters by their classroom teacher, that statement should not be interpreted to mean that creative endeavors on the part of the youngster would be overlooked. Using the area of science for illustrative purposes, instead of having youngsters take scientific terms and writing them several times for the purpose of memorization of content and meaning, the teacher could teach children the strategies of using acronyms and acrostics. One could then provide intermittent opportunities for children to individually or cooperatively create acrostics and acronyms as mnemonic aides. This procedure would assist them in remembering more easily, the content they are studying.

Hypothesis 2

Finding.

In comparing the fifth-grade experimental group students' use of learning strategies, based upon gender, it was found that an obtained F value of .116 fell short of the

4.00 table value. Therefore, the null hypothesis concerning significant differences between girls and boys acquisition of learning strategies was accepted. (See Table 2, p. 76).

Conclusion.

Retaining the null hypothesis above, one can conclude that the skills presented in the learning strategies aspect of this work were of a nature acquirable by both genders.

Educational Implication.

Providing all students with a wide variety of learning strategies is much more important than concentrating on selecting strategies according to gender differences of students.

Hypothesis 3

Finding.

In comparing the experimental and control group students' use of self-directing perceptual skills, it was found that an obtained F value of .14 was not significant at the $p<.05$ level based upon the required 3.92 table value (see Table 3, p. 77). Therefore, the null hypothesis was accepted. Succinctly put, this means that the experimental group students did not acquire a substantially greater number of perceptual strategies than did the control group.

Conclusion

Based on the aforementioned finding, the perceptual skills training in this study did not affect students'

reported use of self-directing perceptual skills over the 7 1/2 week course of the study.

Educational Implication.

Although the perceptual skill training in this study did not produce test score differences favoring this type of training, a study of 12 weeks or more may have more positive results. It is likely that a teacher who intermittently and systematically extended the limits of this study over the course of a nine month period would be able to facilitate in students observable differences in their perceptual strategies.

To develop children's awareness means to bring about a qualitative change in how learning is conceptualized. Likewise, to develop a learner's awareness of how to control personal thoughts, emotions, and actions requires an understanding of how one's perceptions might be changed to a more advanced perception that enables this recommended control. As hypothesis 3 was rejected, it seems that reading a booklet on guiding one's own thought processes is not sufficient for changing perceptions of students. There should be a greater emphasis upon counseling and direct teaching and implementation of these strategies. The educational implication as gleaned from this study, demands more time and effort on the part of the teacher to help children discover how to develop perceptions that students can call upon time and time again for the purpose of guiding

(self-directing) their own lives. Evidently, a general understanding of perceptions is not powerful enough for a student to focus on alone. The child's own role as a change agent for self must be much more active. The most likely influence on the expansion of children's perceptions of how to get in charge of their learning and their own lives is through the teacher using the prescribed materials in this study and focusing on the children's ideas of how to change their thinking about personal acts and behaviors throughout the school year. It is important to stress that in spite of the short time allowable for this study, it is of great importance that this portion of the present study should be seen as a feasibility investigation, that is, a design of a study concerning the perceptual development of youth that is possible as a result of educational experience. The finding that the experimental group did in fact increase their scores on the Perceptual Scale provides grounds for the above-mentioned educational implication.

Hypothesis 4 - Part I

Finding.

In comparing the differences in mean pre- to posttest scores based upon gender on the Perceptual Scale: it was found that an obtained *F* value of 1.05 was not significant at the $p<.05$ level based upon the required 4.00 table value ($df = 1,73$). Therefore, the null hypothesis concerning differences in mean pre- to posttest scores on the

Perceptual Scale based upon gender was retained. This means a significant difference in mean scores did not exist between the girls' pre- and posttest scores on the Perceptual Scale and the boys' pre- and posttest scores on the Perceptual Scale of the experimental group. (See Table 4, p. 80).

Conclusion.

Retaining the null hypothesis, one can conclude that the perceptual strategies presented in this study were of such a non-biased nature they were acquirable by both genders.

Educational Implication.

With regard to the perceptual strategies, teachers may focus their instruction on the class as a whole, rather than attempting to individualize instruction based on gender.

Hypothesis 4 - Part II

Finding.

When a stringent statistical analysis was used (ANCOVA using sequential sums of squares) which tested the differences of the experimental groups pre- to posttest scores on the Perceptual Scale, an important serendipitous finding was observed. An obtained F value of 9.16 was significant at the $p<.003$ level (see Table 4, p. 80). Succinctly put, in comparing the scores of the experimental group on the Perceptual Scale there was a highly significant increase from their pre- to posttest scores after treatment.

Conclusion.

In light of the finding it may be safely concluded that students who receive training in perceptual skills will significantly increase their use of those skills.

Educational Implication.

Teachers need direct training and instruction in the philosophy and applicability of self-directing perceptual skills so that they may prepare environments and structure learning situations that will facilitate the understanding of these concepts in young people.

Self-directing perceptual workshops should be offered to assist teachers in the acquisition, understanding and conduct of self-directing entities that further students understanding of perceptual concepts. To implement the above, the following ideas are presented as a representative but not inclusive selection.

1. With respect to perceptual acquisition and understanding, the teacher will learn for example: a) the major elements of a Self-Directing Discipline Plan, b) how to respond when children involve themselves in verbal, negative, self-talk (i.e., when students "down" themselves).

2. With respect to conducting self-directing activities, the following two types of activities are offered. Instead of marching children in lines throughout the school, children could be expected to move in an orderly fashion--respecting the rights of others, but with freedom

to move on their own in a non-disruptive, intelligent way. Instead of punishing children for outbursts of anger, children can be taught basic self-directing psychological/ behavioral concepts; namely, "Angering is a useless mental behavior"... "If there is personal control demonstrated over the doing part of behavior, appropriate thoughts and feelings seem to follow."

3. Certain predetermined areas of the school may be established--to which children may have the freedom to go--on their own. This would encourage self-discipline.

4. Lastly, teachers could learn how to make full utilization of the student perception booklet utilized in the initial conduct of this study.

Hypothesis 4 - Part III

Since there was not a significant difference based upon gender, but there was a significant difference from pre- to posttest score, an additional analysis was made to assess whether or not the difference could be attributed to a combination of these two factors. In other words, when combining gender and test, would a significant difference be found among the four groups: boys' pretest, boys' posttest, girls' pretest, girls' posttest?

Finding.

It was found that none of the means of the four groups were significantly different from one another. The

significant differences evidenced in Part II were apparently distributed across these four groups.

Conclusion.

The perceptual skills offered in this program were acquirable by students regardless of gender and test. Neither gender is affected more than the other, nor did the significant difference lie between test settings (for example: pre- test girls and posttest boys). The treatment was effective across gender and test.

Educational Implication.

Teachers may discuss the prescribed perceptual activities as they are described in the student booklet: A Personal Guide to My Own Thought Processes.

1. Class discussions may be held focusing on options students have when confronted by another child.

2. Class discussions may focus on impact statements of positive affirmations that can have powerful meaning for youngsters.

Magnitude and Direction of Correlations

Hypotheses 5, 6, 7 and 8

Hypotheses 5, 6, 7 and 8 deal with establishing the degree of relationship between different sets of measurements (as can be seen by Table 5, p. 83). Only one of the correlations (Hypothesis 6) was found to be significant at the $p<.05$ level. So, rather than describing in terms of magnitude and direction, a more succinct summary

of the findings will be given for Hypotheses 5, 7 and 8 with Hypothesis 6 being treated separately.

With respect to Hypotheses 5, 7 and 8; the magnitude of the correlations for each hypothesis was, by Guilford's guidelines as stated in Williams (1986), almost negligible. The direction of each of the correlations was positive. The level of significance will be described as each hypothesis is discussed.

Hypothesis 5

Finding.

To test the relationship between readiness to self-direct and students' use of self-directing learning strategies, a Pearson Product Moment Correlation coefficient was calculated using pretest data from the Zimmerman and Martinez-Pons' SRLIS and the Guglielmino SDLRS of the experimental groups. A correlation coefficient of .16 was calculated; which failed to reach the critical value of .232 for $p>.05$ level of significance ($df = 73$). Therefore, the null hypothesis was retained. This means there was not a significant correlation between readiness to self-direct and the students' use of self-directing learning strategies.

Conclusion.

From the evidences of a low correlation in this study, it is safe to conclude that the predictive power of one instrument for the other has limited value. Apparently, the constructs that make up each concept, while comprising

similarities, are highly diverse. This is unusual because one would assume that students would need to be ready to self-direct before it would be appropriate to expose them to learning strategies that would assist them in self-directing endeavors (activities).

Hypothesis 6

Finding.

In measuring the correlation between the Perceptual Scale and the Guglielmino SDLRS it was found that a significant correlation ($r = .69$) exists between these two measurements at the .001 level of significance. The critical value for $p>.001$ is .303 for a two-tailed test. Therefore, the null hypothesis, stating no correlation between the Perceptual Scale and the Guglielmino SDLRS, was rejected in favor of the research hypothesis.

Conclusion.

In future use of the Guglielmino and Perceptual Scale, one could safely predict a high score on one instrument from a high score on the other. Therefore, it might be inadvisable to incorporate the use of both instruments in future studies unless one was interested in the use of one instrument as a covariate for the other as was the case in this present study.

Hypothesis 7

Finding.

To study the relationship between the experimental

group students' use of perceptual skills and their use of learning strategies, a Pearson Product Correlation Coefficient of .13 was calculated using posttest data. This correlation failed to reach the critical value of .232 for the $p<.05$ level of significance ($df = 73$). Therefore, the null hypothesis was retained. This means students' use of perceptual skills was not highly correlated with their use of learning strategies.

Conclusion.

Based upon the finding stated above, one can conclude that for the purpose of this study the predictive power of one instrument for the other has limited value. Students may involve themselves in the overt usage of self-directing learning strategies without an understanding of the more subtle realities of the perceptual aspect. Each area is composed of skills which may be acquired at will. While the access of one is not contingent upon the acquirement of the other, the full ramifications of the power of the two combined will not be accessible until further development and implementation of the perceptual program has been made.

Hypothesis 8

Finding.

To study the relationship between students' use of learning strategies and students' use of perceptual strategies in the control group a Pearson Product Correlation Coefficient was calculated rendering a .20

correlation coefficient. This coefficient was not significant at the $p<.05$ level as it did not reach the .252 critical value ($df = 75$). Therefore, the null hypothesis, stating that there was not a significant correlation between students' use of learning strategies and their use of perceptual skills in the control group was retained.

Conclusion.

One can conclude that for the purposes of this study, the Self-Directing Perceptual Scale has limited predictive value for the Zimmerman and Martinez-Pons' Interview Schedule. This finding tends to support the belief that perceptual skills and learning strategies are not naturally correlated. Simply knowing and having a host of learning strategies that provide some assurance of school success does not assure one that a student has firm control over personal perceptions that make a wholesome, satisfying life.

Educational Implication.

Knowledge and acquisition of perceptual understandings should enhance self-directing learning powers, so that strategies acquired are more personal and meaningful.

To accomplish this task a teacher may:

1. Allow students choice over some of the elements of a learning situation. For example, let a student choose with whom to work, how the objective is to be reached or when certain portions of a project will be completed.

2. A facilitative teacher will provide students with the opportunity to take as much responsibility for personal learning as students are willing to take. In a given area, students may be allowed to choose their own area of interest, and with teacher approval, pursue their topic.

In Conclusion

In this researcher's opinion, one would be mistaken to conclude from these findings, that the self-directing perceptual skills are not a vital part of self-directed living. On the contrary, they appear to be the most subtle and perplexing aspect. The documentation on motivation, learning attributes and self-efficacy is too thorough to disregard; the work and research on the global application of these pioneer ideas too young to consider conclusive.

Future work in the perceptual area will need to focus more stringently upon the entities that comprise this concept. A more detailed program of instruction will need to be provided for teachers. Perceptual skills appropriate for primary grades children will need to be identified, as well as successful strategies for implementing these skills. With these measures, along with an extended time period for instructional purposes, more positive results would be expected.

Self-Directed Learning--A Glance at the Future

Certain of the research in this dissertation showed that fifth-grade students acquired a number of additional strategies of learning during the conduct of this study.

As facilitators, teachers aid learners in becoming comfortable and more proficient with self-directed learning activities. It is crucial that all students be provided assistance in locating and using available resources both within school and within the local community. The greater the wealth of information available, and the extent of its exploration, the more likely newer strategies for absorbing it will be needed.

In witnessing the work of experimental teachers in action, the empirical finding was that educators must play the following role if they are to foster self-directed learning: modeling, coaching, directing, collaborating, and leading youngsters. These research participants were seen locating resources, mentoring, serving as a validator of learning, and builders of confidence in personal abilities. Facilitating the aforementioned observations is not easy for most educators. It is a three-fold proposition: (a) it requires a lot of work, (b) considerable meditation in advanced planning, and (c) a tremendous faith in the inherent personal ability of learners to take charge of their own learning.

It is imperative that teacher training institutions, on-the-job teachers and administrators who are interested in SDL foster the type of training that will help experienced and aspiring teachers understand the impact they have on learners' abilities to accept personal responsibility for

what they are learning, and especially, how they are learning it (strategies).

A note of caution.

To those who are committed to promoting self-direction as a way of life, they should be careful that in their zeal to promote opportunities for self-directed learning, that they do not inadvertently set such students up for failure. Since words like "success," "achievement," "risk-taking" are value-laden, and for some people, are much less important then merely learning for enjoyment, outside intervention would press children in false expectations. In other words, if "success" in school is measured as a "high grade," a student may have the essential strategies for learning the material as in language lessons, but how the newly acquired skills are applied in an actual composition could be his/her downfall. Hence, that student would need more help and practice with direct application of what has been learned. Nevertheless, it is the belief of this researcher that self-direction needs to be viewed as a major element of a teacher's knowledge to be used with good judgment and discrimination as attempts are made to help each student with a plan for acquiring personalized strategies for up-grading self-directed learning and study.

Summary

This present study includes an assessment of the acquisition of self-directed learning strategies and

self-directed perceptual skills for fifth-grade students. An examination was made of both of these areas with regard to gender. The relationships among perceptual skills, learning strategies and readiness to self-direct were also assessed.

While there was a substantial correlation between students perceptual skills and their readiness to self-direct; the acquirement of perceptual skills and learning strategies occur independently of one another. Each of these areas, learning strategies and perceptual skills are dynamic aspects of self-direction.

Unquestionably, fifth-grade students are capable of learning a variety of strategies to employ at will during learning episodes. Specifically, they can monitor their own progress toward goals, structure their learning environment to meet their own personal learning needs. They may involve themselves in "deep-processing" by allowing time to make meaningful cognitive connections. They can self-select from a variety of mnemonic devices which facilitate more accurate information retrieval. In short, they can be taught strategies of learning which can empower them to creatively manage their own learning. Through mastery of both of these areas students will be empowered to become masters of, not only the inner workings of their own minds, but they will also possess the power to direct their own present and future learning experiences as well.

Recommendations for Further Study

In Light of Enhancing this Present Study

1. There was empirical evidence that several students were learning to self-question; that is, they were beginning to self-generate questions based on lectures, strategies to learn, and the processes that were being developed in their own mind. It would be interesting to determine if intermediate level students who were assisted in "self-questioning" procedures in fact had a greater long-term retention of lecture material then do only note-takers and summarizers.

2. In this present study, the frequency with which students used various learning strategies was included in their composite score. In replicating this present study, it would be advisable to plan a separate analysis to determine which learning strategies were used most by the students overall; and which learning strategies were used most by high and low achievers.

Recommended Studies Akin to But Beyond the Scope of this Investigation

1. It is important not only to be cognizant of, but to understand, cross-cultural differences that may influence the impact and perceived value of self-directed learning among learners. Thus, it seems a significant study could be developed to assess areas of learning in which different cultural groups within the United States could have some

initial difficulties with self-directed approaches to learning. It may be that some culture presses their youth to be open and out-going, while another culture urges their children to be quiet, conforming, and more reserved.

3. A provocative study could be developed for exploring the relationship between the personal history-based beliefs pre-service teachers brought to their study of teaching, which includes the principles of self-directed learning. This investigation would represent an effort to look closely at how pre-service teachers use the knowledge about self-directed learning they bring with them from their lives as students to make decisions while engaged in course work about self-directed ideas as heard in lecture and discussion by their college professor who is teaching this subject. Pre-service teachers' prior knowledge and beliefs about self-directed learning are indeed powerful elements with which teacher educators must contend. They influence the decisions that pre-service teachers make about the value of all one hopes to teach them. If the myths pre-service teachers hold about self-directed learning can be aborted, and if ways are found to encourage and sustain critical conversations about those beliefs on this subject, the likelihood of their utilizing the self-directing principles being taught, is greatly increased.

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APPENDIX A

GUGLIELMINO SCALE

SDLRS-E

Name_____ Age_____

Sex_____ Grade_____ Date of testing_____

School_____

QUESTIONNAIRE

INSTRUCTIONS: This is a questionnaire to help get information on how you like to learn best and how you feel about learning. Read each sentence and circle the one answer which is most like you. Be sure to answer every question.

There are no wrong answers, so be sure to mark the answer which tells how you feel. Usually the answer that comes to your mind first is the answer that is true for you.

ITEMS:	RESPONSES: I never feel like this.	I feel like this only once in a while.	Half the time I feel this way.	I usually feel like this.	I feel like this all the time.
*Sample Item: I like chocolate sauce on my ice cream.	☐	☐	☐	☐	■
1. I will always want to learn.	☐	☐	☐	☐	■
2. I know what I want to learn.	☐	☐	☐	☐	■
3. When I see something that I don't understand, I stay away from it.	☐	☐	☐	☐	■
4. If there is something I want to learn, I can figure out a way to learn it.	☐	☐	☐	☐	■
5. I love to learn.	☐	☐	☐	☐	■
6. In the classroom, I expect the teacher to tell all the students exactly what to do all the time.	☐	☐	☐	☐	■
7. I believe that thinking about what kind of person I am and what kinds of things I want to do in my life should be a big part of my education.	☐	☐	☐	☐	■
8. I don't work very well on my own.	☐	☐	☐	☐	■

Go on to the next page.

		I never feel like this.	I feel like this only once in a while.	Half the time I feel this way.	I usually feel like this.	I feel like this all the time.
9.	I know where to go to get information when I need it.	☐	☐	☐	☐	■
10.	I can learn things by myself better than most kids my age.	☐	☐	☐	☐	■
11.	Even if I have a great idea, I can't figure out how to make it work.	☐	☐	☐	☐	■
12.	When it's time to learn something, I like to help choose what to learn and how I'm going to learn it.	☐	☐	☐	☐	■
13.	I don't mind studying hard if I'm interested in something.	☐	☐	☐	☐	■
14.	I am the only one who is really responsible for what I learn.	☐	☐	☐	☐	■
15.	I can tell when I'm learning something so I can really understand it and when I'm not.	☐	☐	☐	☐	■
16.	There are so many things I want to learn that I wish there were more hours in the day.	☐	☐	☐	☐	■
17.	If there is something I have decided to learn, I can find time for it, no matter how busy I am.	☐	☐	☐	☐	■
18.	Understanding what I read is a problem for me.	☐	☐	☐	☐	■
19.	If I don't learn something well, it's not really my fault.	☐	☐	☐	☐	■
20.	I know when I need to learn more about something.	☐	☐	☐	☐	■
21.	If I can understand something well enough to get a good mark on my work, it doesn't bother me if I still have questions about it.	☐	☐	☐	☐	■
22.	I think libraries are boring places.	☐	☐	☐	☐	■
23.	The people I want to be like when I grow up are always learning new things.	☐	☐	☐	☐	■

Go on to the next page.

		I never feel like this.	I feel like this only once in a while.	Half the time I feel this way.	I usually feel like this.	I feel like this all the time.
24.	I can think of many different ways to learn about something new.	☐	☐	☐	☐	☐
25.	I try to think about how the things I am learning will fit in with the plans I have for myself.	☐	☐	☐	☐	☐
26.	I can learn anything I need to know by myself.	☐	☐	☐	☐	☐
27.	I really enjoy searching for the answer to a question.	☐	☐	☐	☐	☐
28.	I don't like thinking about questions where there isn't a right answer.	☐	☐	☐	☐	☐
29.	I have a lot of questions about things.	☐	☐	☐	☐	☐
30.	I'll be glad when I'm finished learning.	☐	☐	☐	☐	☐
31.	I'm not as interested in learning as some other kids my age seem to be.	☐	☐	☐	☐	☐
32.	When I decide to find out something, I do it.	☐	☐	☐	☐	☐
33.	I like to try new things, even if I'm not sure how they will turn out.	☐	☐	☐	☐	☐
34.	I don't like it when people who really know what they're doing point out mistakes that I'm making.	☐	☐	☐	☐	☐
35.	I'm good at thinking of new ways to do things.	☐	☐	☐	☐	☐
36.	I like to think about the future.	☐	☐	☐	☐	☐
37.	I'm better than most kids my age at finding out things.	☐	☐	☐	☐	☐
38.	A hard problem doesn't stop me.	☐	☐	☐	☐	☐
39.	I can make myself do what I think I should.	☐	☐	☐	☐	☐
40.	I am really good at solving problems.	☐	☐	☐	☐	☐

Go on to the next page

		I never feel like this.	I feel like this only once in a while.	Half the time I feel this way.	I usually feel like this.	I feel like this all the time.
41.	I become a leader in learning groups.	☐	☐	☐	☐	☐
42.	I like talking about ideas.	☐	☐	☐	☐	☐
43.	I don't like learning things that are hard.	☐	☐	☐	☐	☐
44.	I really want to learn new things.	☐	☐	☐	☐	☐
45.	The more I learn, the more exciting the world becomes.	☐	☐	☐	☐	☐
46.	Learning is fun.	☐	☐	☐	☐	☐
47	It is better to stick with the ways of learning we know will work instead of always trying new ones.	☐	☐	☐	☐	☐
48.	I want to learn more; it will help me keep getting better as a person.	☐	☐	☐	☐	☐
49.	It's really up to me to learn – the school and the teachers can't do it for me.	☐	☐	☐	☐	☐
50.	Learning ways to learn is important to me.	☐	☐	☐	☐	☐
51.	No matter how old you get you can keep learning.	☐	☐	☐	☐	☐
52.	Learning all the time is boring.	☐	☐	☐	☐	☐
53.	Learning is something you will use all your life.	☐	☐	☐	☐	☐
54.	I learn several new things on my own each year.	☐	☐	☐	☐	☐
55.	Learning doesn't make any difference in my life.	☐	☐	☐	☐	☐
56.	I am a good learner in the classroom and on my own.	☐	☐	☐	☐	☐
57.	Learners are leaders.	☐	☐	☐	☐	☐
58.	I like to see if I can solve hard problems.	☐	☐	☐	☐	☐

APPENDIX B

ZIMMERMAN AND MARTINEZ-PONS' INTERVIEW SCHEDULE

ADAPTATIONS OF INTERVIEW SCHEDULE
SESSION MANUAL
Materials

1. Interview Schedule
2. Individual interview response from (Appendix A)
3. Consistency scale on a 3 x 5 card (Appendix B)
4. Pencils
5. Backup cassette recorder

Physical Setting

Room for interview
   a. Table
   b. Two chairs facing across the table
   c. Electrical outlet for cassette recorder

Procedure

1. Check the student's name before he/she enters the interview room.

2. Greet the student as follows: "HELLO, I AM _____ FROM THE UNIVERSITY OF NORTH TEXAS. YOU ARE [mention the student's name. When he/she responds in the affirmative, proceed:]? Do you have any special interests or hobbies? THANK YOU FOR AGREEING TO HELP US IN THIS STUDY. WE ARE LOOKING AT THE WAY STUDENTS LEARN. I'D LIKE TO ASK YOU SOME QUESTIONS CONCERNING THE WAY YOU STUDY. YOU NEED TO KNOW THAT THERE ARE NO "CORRECT" ANSWERS TO THE QUESTIONS THAT I'LL ASK YOU. ALSO, SOME OF THE WAYS YOU STUDY MAY BE USED IN MORE THAN ONE SITUATION. YOU WILL NEED TO REFER TO THIS CARD [point to the consistency scale 3 x 5 card] TO RESPOND TO SOME OF THE QUESTIONS LATER ON. FEEL FREE TO LOOK AT IT WHEN THE TIME COMES. ARE YOU READY?

3. For each question below, a) ask the question (page 3), b) follow up and c) assign a score, according to the following scheme:

   a. Ask the question

      If the student gives a clear method, ask, "IS THERE ANYTHING ELSE YOU DO?"

      If the student says "YES", But does not give answer, ask "WHAT DO YOU DO?"

      If the student says, "I DON'T DO ANYTHING (MORE)" or words to that effect, go to b.

b. Then ask, the follow-up question: "WHAT IF YOU ARE REALLY HAVING TROUBLE? THEN WHAT DO YOU DO THAT HELPS YOU?

If the student gives a clear method, ask, "IS THERE ANYTHING ELSE YOU DO?"

If the student offers a general or ambiguous method, ask "COULD YOU BE MORE SPECIFIC?"

If the student still says, "I DON'T DO ANYTHING MORE" or words to that effect, go to c.

For each strategy mentioned, record the question number in the "Item Number" column on the Individual Interview Response Form (ILRF). Record the strategy in the "Strategy" column on the ILRF. Use only one strategy per line.

c. Say, "NOW, FOR EACH STRATEGY THAT YOU MENTIONED, I WILL ASK YOU HOW OFTEN YOU USE IT. LOOK AT THE CARD IN FRONT OF YOU TO DECIDE. [Point to the 3 x 5 card.] I WILL READ THE FREQUENCY CATEGORIES ALONG WITH YOU."

For each strategy mentioned, say, "HOW OFTEN DO YOU ... [mention the strategy]?"

(1) Seldom (2) Occasionally (3) Frequently (4) Most of the time

Record the student's response in the column titled "Frequency" on the Individual Interview Response Form.

d. Then go to next question (page 4).

4. For each strategy recorded in the Individual Interview Response Form, in the column titled "Category", enter the category under which it falls. Use only <u>one</u> category per strategy. Use the following categories to classify each strategy:

(1) Self-Evaluation
(2) Organizing and transforming
(3) Goal-setting and planning
(4) Seeking information
(5) Keeping records and monitoring
(6) Environmental structuring
(7) Self-consequences
(8) Rehearsing and memorizing
(9) Seeking peer assistance
(10) Seeking teacher assistance

(11) Seeking adult assistance
(12) Reviewing tests
(13) Reviewing notes
(14) Reviewing texts
(15) Other

CONSISTENCY SCALE RESPONSE CATEGORIES

(1) Seldom (2) Occasionally (3) Frequently (4) Most of the time

ZIMMERMAN AND MARTINEZ-PONS' ADAPTED QUESTIONS

Question 1 (Classroom Learning). Assume the teacher is discussing a topic with your class, such as the civil war. He or she says you will be tested on the topic. Do you have a method to help you learn and remember what was discussed in class?

Question 2 (Writing Assignment). Teachers often assign their class the task of writing a short paper outside of class on a topic such as your favorite past time. They also often use one's score as a major part of one's grade. In such cases, do you have any particular method to help plan and write your paper?

Question 3 (Math Assignment). When completing a math assignment, is there any particular method you use to complete it?

Question 4 (Test Taking). Most teachers give a test at the end of a marking period, and these tests greatly determine one's final grade. Do you have a method for preparing for a test in classes like geography or history?

Question 5 (Motivation). Many times students are able to complete homework assignments even though there are other, more interesting things they would rather do. Do you have any particular method for motivating yourself to complete your homework under these circumstances?

Question 6 (Studying at Home). Most students find it necessary to study at home. Do you have any particular methods for improving your study at home?

INDIVIDUAL INTERVIEW RESPONSE FORM (IIRF)

Student Number _____ Interviewer's Initials _____

Item Number	Strategy	Frequency	Category

DEFINITIONS AND EXAMPLES OF SELF-REGULATED

LEARNING STRATEGIES

Table 1
Definitions

Categories Strategies		Definitions
1.	Self-evaluation	Statements indicating student-initiated evaluations of the quality of completed work e.g., "I check over my work to make sure I did it right."
2.	Organizing and transforming	Statements indicating student-initiated overt or covert rearrangement of instructional materials to improve learning e.g., "I make an outline before I write my paper."
3.	Goal-setting and planning	Statements indicating student setting of educational goals or subgoals and planning for sequencing, timing, and completing activities related to those goals, e.g., "First, I start studying two weeks before exams, and I pace myself.
4.	Seeking information	Statements indicating student-initiated efforts to secure further task information from nonsocial sources when undertaking an assignment e.g., "Before beginning to write the paper, I go to the library to get as much information as possible concerning the topic."
5.	Keeping records and monitoring	Statements indicating student-initiated efforts to record events or results e.g., "I took notes of the class discussion." "I kept a list of the words I got wrong."
6.	Environmental structuring	Statements indicating student-initiated efforts to select or arrange the physical setting to make learning easier e.g., "I

	isolate myself from anything that distracts me." "I turned off the radio so I can concentrate on what I am doing."
7. Self-consequences	Statements indicating student arrangement or imagination of rewards or punishment for success or failure e.g., "If I do well on a test, I treat myself to a movie."
8. Rehearsing and memorizing	Statements indicating student-initiated efforts to memorize material by overt or covert practice e.g., "In preparing for a math test, I keep writing the formula down until I remember it."
9-11. Seeking social assistance	Statements indicating student-initiated efforts to solicit help from peers (9), teachers (10), and adults (11) e.g., "If I have problems with math assignments, I ask a friend to help."
12-14. Reviewing records	Statements indicating student-initiated efforts to reread notes (12) tests (13), or textbooks (14) to prepare for class or further testing e.g., "When preparing for a test, I review my notes."
15. Other	Statements indicating learning behavior that is initiated by other persons such as teachers or parents, and all unclear verbal responses e.g., "I just do what the teacher says."

APPENDIX C

SELF-DIRECTING PERCEPTUAL SCALE

STUDENT QUESTIONNAIRE

Self-Directing Perceptual Scale

I am trying to find out how students think and feel about a number of important topics. In order to do this, I would like to ask you to answer some questions. This is not an intelligence test nor an information test. There are no "right" or "wrong" answers. The best and only correct answer is YOUR PERSONAL OPINION. Whatever you answer is, there will be those who agree and those who disagree. What I really want to know is HOW YOU FEEL about each statement.

Read each statement very carefully, and then indicate your response by following these specific directions:

> "For each sentence, mark to what extent it is true, in your opinion: most of the time, frequently, occasionally, seldom, or never."

EXAMPLE:	Never	Seldom	Occasionally	Frequently	Most of the time

1. I'm a happy person.

Please do not make any marks on the questionnaire booklet itself. You may have as much time as you need, so read each statement very carefully and answer it the best way you can. When you finish close your questionnaire booklet and turn your answer sheet over as a signal that you have finished.

1. I enjoy helping others.

2. I push myself to do a good job.

3. Each day I try to do better than I did the day before.

4. I make things happen for me rather than letting them happen by chance.

5. When I work in a small group I don't mind asking for help from others.

6. I regularly practice to do things better.

7. School lessons seem to be one big struggle after another.

8. I learn things quickly.

9. I reward myself when I do something I'm proud of.

10. I like to make decisions.

11. I tell myself I'm a successful person.

12. I try hard to control my anger.

13. I think I lead a "happy" life.

14. I am responsible for what I do.

15. When my teacher presents new information, I begin immediately to look for a good way (strategy) to learn it.

16. I do more than the teacher expects me to do on assignments.

17. I am a successful student.

18. My classmates think I'm an important member of this class.

19. Even if I feel I'm right, I "give in" to others just to win their approval.

20. Knowing the answer is more important than knowing how to find the answer.

21. The world we live in is a pretty lonesome place.

22. My setting of personal goals helps me get more done.

23. I do good things for others without being asked to do so.

24. I feel I'm not a good student if I have to ask others for help.

25. I like to try things I'm not used to doing.

26. Asking questions at school usually gets me into trouble.

27. I memorize most of what I am asked to learn.

28. I punish myself when I do things I am ashamed of.

29. I am allowed to help choose my school learning experiences.

30. Before I being working on an assignment, I think about being successful on it.

31. I need rules to help me control my personal behavior at school.

32. When someone makes me angry I have a personal plan that helps me control my actions.

33. I'm good at knowing how long it will take me to do something.

34. At school I am afraid I will get into trouble or get blamed for something I didn't do.

35. I try to get out of doing things I think will be difficult.

36. I don't feel I have to win to enjoy games.

37. I believe I can have any career I want.

38. Sometimes I let my friends talk me into stuff I shouldn't do.

39. At school I feel I have a fair share of my teacher's time to talk to her/him about things that are important to me.

40. A person's feelings on a topic are as important as the facts.

41. Not many people in the world are really kind.

42. I set goals that are easy so I can accomplish them with little effort.

43. I have bad thoughts about myself.

44. I am helpful to others when I work in a small group.

45. I am bored when I am by myself.

46. School teaches me a lot about myself.

47. I like to work at my own speed.

48. When I have a problem I personally take steps to solve it.

49. I trust my own decisions.

50. I practice having good feelings about myself everyday.

51. I spend time being angry.

52. I can do the "right things" without someone telling me what to do all the time.

53. I do my schoolwork without my teacher having to make me do it.

54. I put myself down (say "I'm no good!", "I never do anything right.").

55. I make myself do even the hard lessons my teacher assigns.

56. It hurts my feelings when other kids criticize me.

57. I am good at remembering what my teacher expects me to know.

58. I am proud of what I do.

59. If someone has mistreated me (acted badly toward me) then I just forget it and don't do anything back.

60. I experience happiness in my life everyday.

61. If something goes wrong in my life it is usually someone else's fault instead of my own.

62. I like the way I treat other people.

63. When we do committee work, I like to be the leader.

64. I bring new ideas to topics discussed in class.

65. I like to defend (explain) my answers during class discussions.

66. I have a lot of ways to learn things.

67. When things aren't going right for me, I'm good at figuring out what's wrong.

68. After my teacher assigns a lesson, I would like to be allowed to choose how I do it.

69. When I feel tense and upset, I rarely lose control.

70. I get upset at myself for not getting "good grades" on a test.

71. To learn something, I just read it over and over again until I remember it.

72. I am sensitive to the needs of others.

73. When I feel tense and upset, I have a positive plan to help me relax.

74. I feel a sense of purpose in my life (like "helping others"; "doing something to keep our school neat and clean").

75. I like the way I look.

76. I like to depend on myself for what I do.

77. I know what is right or wrong when I must decide what to do.

78. If I don't do well on an assignment, I think to myself, "I'll do better next time."

79. I can control my own feelings.

80. It's the people around me that cause me to do what I do.

81. I'd rather be a worker, than a boss.

82. In class I ask a lot of questions about what I am learning.

83. Being clean and neat is just as important as being good.

84. Awful things just happen to me; I can't do anything about them.

85. Things happen in my school life that make me feel unhappy.

86. My mistakes (if I correct them) can help me become successful.

87. I would like to change how I feel about myself.

88. I watch television when I don't have anything to do at home.

89. I do things for others without expecting some kind of reward.

90. I am responsible for everything I do.

91. If I just wait patiently, I think things will get better in my life.

92. I like to answer questions in class.

93. No matter how difficult the learning task, I try to do it.

94. I'm afraid I'll get into trouble at school.

95. I can figure out how to learn what my teacher teaches me.

96. I take care of my own problems.

97. There is a lot of sorrow in life but just a little happiness.

98. I rarely lose control when I talk to people who have made me mad.

99. I feel successful in school.

100. At school I pretend I'm busy more than I really am.

101. If I have a problem I talk about it.

102. I create new ways of learning what my teacher expects me to learn.

103. It's a natural thing for people to get angry at one another.

104. I feel like a winner when I think about how well I'm doing in school.

105. I know how to study in order to be a good student.

106. I succeed more than I fail at solving my personal problems.

107. I do my work without having to be told to do so by others.

108. When someone hits me, I hit back.

109. I don't tell people about my ideas because they will laugh.

110. I study myself to determine why I think like I do.

111. I put off doing my homework as long as I can.

112. My school work helps me to learn how to learn on my own.

113. I have a plan I use to judge my own progress on things I'm learning.

114. I enjoy life at school.

115. I think my own ideas and creative thoughts are considered important in my classes.

116. I ask somebody for help when I don't know what to do in my school work.

117. I make thoughtful connections between what I know and what the teacher is teaching me.

118. I do nice things for others on my own.

119. School helps me learn what I really want to know.

120. I have ways for learning that help me perform well in school.

121. I think I lead a "happy" life away from school.

122. I feel "left out" by others when they choose people for games and activities.

123. I like the way I feel about myself.

124. When I am wrong, I am willing to admit my mistake.

125. I feel I am becoming a better thinker.

126. I believe my teacher really understands me (what I am like; what I believe).

127. I think about what I want to teach myself each day.

128. I am talented.

129. Most of the work I have to do at school is too hard for me.

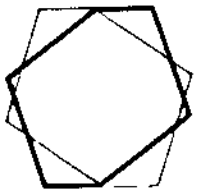
130. I like myself.

131. I try to be <u>like</u> what people around me want me to be.

132. I always try--even if I don't know exactly what to do.

APPENDIX D

LETTER OF PERMISSION FROM BARRY J. ZIMMERMAN REGARDING THE USE OF THE SELF-REGULATED LEARNING INTERVIEW SCHEDULE



The Graduate School and University Center
of The City University of New York

Ph D Program in Educational Psychology / Box 445
Graduate Center, 33 West 42 Street, New York, N Y 10036-8099
212 642-2261

Ms. Pam S. Lane
#5 Rolling Hills Circle
Denton Texas 76205

Dear Ms. Lane:

Regarding your letter of February 7th requesting permission to use the Zimmerman and Martinez-Pons Self Regulated Learning Interview Schedule, we have no objections to your use of the scale or to the modifications that you have proposed for an elementary school population. We appreciate your acknowledgement and would ask only that you send us a copy of your results when they are available.

Sincerely,

Barry J. Zimmerman

Professor
Barry J. Zimmerman

APPENDIX E

WORKSHOP

Self-Directed Learning Workshop

March 9, 1992

7:00 - 7:10	•Introductions
7:10 - 7:30	•Preview highlights of related literature
	•Discuss the Philosophy of Self-Direction
	•Contrast Traditional Teachers Role and Self-Directing Teachers Role
7:30 - 7:50	•Present Overview & Organization of Teacher Activity Packet and Student's Notebook
7:50 - 8:00	•Question and Answer Session
	Adjournment

APPENDIX F

DERIVATION OF COMPOSITE SCORE FOR THE ZIMMERMAN AND MARTINEZ-PONS' SELF-REGULATED LEARNING INTERVIEW SCHEDULE

Zimmerman and Martinez-Pons' Interview Schedule

Yielding and Individual

Composite Scores

Table 1

Self-Regulated Learning Contexts

1. Assume a teacher is discussing a topic with your class such as the civil war. He or she says that you will be tested on the topic. Do you have a method to help you learn and remember what was discussed in class?
2. Teachers often assign their students the task of writing a short paper outside class on a topic such as your favorite pastime. They also often use the score as a major part of one's grade. In such case, do you have any particular method to help you plan and write your paper?
3. Is there any particular method you use to complete it?
4. Most teachers give a test at the end of a marking period and these tests greatly determine one's final grade. Do you have a particular method for preparing for a test in classes like Geography or history?
5. Many times students are able to complete homework assignments even though there are other, more interesting things they would rather do. Do you have any particular method for motivating yourself to complete your homework under these circumstances?

6. Most students find it necessary to study at home. Do you have any particular methods for improving your study at home?

Derivation of Individual Score

Strategy	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
*Frequency		4				3	3	3			3			4	2
		2				2					3			2	
	3										3				
											3				
Sums X	3	6				5	3	3			12			6	2
*Weight	1	3				1	2	3			2			2	1
	3 +	18		+		5	+ 6	+ 9		+	24		+	12 +	2 = 77

This researcher and Dr. Bill Brookshire, Associate Professor of Educational Foundations, Research and Special Education at the University of North Texas, cooperatively developed a process for computing an individual composite score for the results from the Zimmerman and Martinez-Pons' Self-Regulated Learning Interview Schedule.

* Acknowledgment is given in full to Dr. Zimmerman and Dr. Martinez-Pons (1988) whose work provides guidelines for this especially contrived table. The weights are based upon the table appearing on subsequent page.

Students' Self-Regulated Learning Strategy Loadings on and Correlations With the Canonical Root

Strategy	Loading	r
Self-Evaluation	-.06	-.10
Organizing and transforming	.34	.36**
Goal setting and planning	.00	-.01
Seeking information	.23	.28**
Keeping records and monitoring	.05	.24*
Environmental structuring	.16	.15
Self-consequences	-.04	.19*
Rehearsing and memorizing	.60	.48**
Seeking peer assistance	.23	.31**
Seeking teacher assistance	.12	.14
Seeking adult assistance	.06	.22*
Reviewing tests	.20	.24*
Reviewing notes	.08	-.15
Reviewing texts	-.12	-.23*

* $p<.05$

** $p<.01$

Note. From "Construct Validation of a Strategy Model of Student Self-Regulated Learning" by B. J. Zimmerman and M. Martinez-Pons, 1988. Journal of Educational Psychology, 80, p. 288.

INDIVIDUAL INTERVIEW RESPONSE FORM (IIRF)

Student Number _____ Interviewer's Initials _____

Item Number	Strategy	Frequency	Category
1	- hardly anyone takes notes so I don't either		
	- at home I ask my parents	3	11
	- look at my book	4	14
2	sometimes I look at my book	4	2
2	- I write down things that I want to include and then write it	2	2
	- ask my parents	3	11
3	- Go over the question and make sure I have them all right	3	1
	- usually I ask my dad	3	11
4	- read over my History book	2	14
	- write down stuff out of my book	3	8
	- parents	3	11
5	- I know I have to do it anyway so I go ahead & do it so I can go ahead and do what I want to	3	7
	Sometimes I go do the thing I want to do is then do my homework	2	15
	Go to my room to study	3	6
6	Ask others to cut off the TV	2	6

APPENDIX G

PERCEPTUAL SCALE AS IT WENT TO JURY

		inappropriate item	worse item	acceptable item	highly appropriate item
1.	Pupils who try should get good grades even if they make mistakes.				
2.	Knowing the answer is more important than knowing how to find the answer.				
3.	A person's feelings on a topic are as important as the facts.				
4.	If someone has done something wrong to me it is better to forget it than to forgive that person for what he(she) did.				
5.	Because of my beliefs I know what is right or wrong when I must decide what to do.				
6.	Being clean and neat is just as important as being good.				
7.	I do things for others without expecting some kind of reward.				
8.	There is a lot of sorrow in life but just a little happiness.				
9.	The world we live in is a pretty lonesome place.				
10.	Not many people in the world are really kind.				
11.	I experience happiness in my life everyday.				
12.	If I don't do well on an assignment, I think to myself, "I'll do better next time."				
13.	Each day I try to do better than I did the day before.				
14.	My setting of personal goals helps me get more done.				
15.	I set goals that are easy so I can accomplish them with little effort.				
16.	If something goes wrong in my life it is usually someone else's fault instead of my own.				
17.	I can control my own feelings.				
18.	Things happen in my school life that make me feel unhappy.				

		inappropriate item	revise item	acceptable item	highly appropriate item
19.	I am responsible for everything I do.				
20.	I make things happen to me rather than letting them happen by chance.				
21.	I can make good things happen to me in my life.				
22.	I have bad thoughts about myself.				
23.	I like the way I treat other people.				
24.	It's the people around me that cause me to do what I do.				
25.	I would like to change how I feel about myself.				
26.	If I just wait patiently, I think things will get better in my life.				
27.	Awful things just happen to me; I can't do anything about them.				
28.	It hurts my feelings when other kids criticize me.				
29.	When I work in a small group I don't mind asking for help from others.				
30.	It's only "weak" students who depend on other people for help.				
31.	I am helpful to others when I work in a small group.				
32.	When we do committee work, I like to be the leader.				
33.	I'd rather be a worker, than a boss.				
34.	People who are successful sometimes fail.				
35.	I like to answer questions in class.				
36.	I regularly practice to do things better.				
37.	I like to try things I'm not used to doing.				
38.	I am bored when I am by myself.				
39.	I bring new ideas to topics discussed in class.				

		inappropriate item		acceptable item	highly appropriate item
40.	In class I ask a lot of questions about what I am learning.				
41.	I watch television when I don't have anything to do at home.				
42.	I enjoy helping others.				
43.	I am sensitive to the needs of others.				
44.	I do nice things for others on my own.				
45.	School lessons seem to be one big struggle after another.				
46.	Asking questions at school usually gets you into trouble.				
47.	School teaches me a lot about myself.				
48.	I like to defend (explain) my answers during class discussions.				
49.	I'm afraid I'll get into trouble at school.				
50.	I feel successful in school.				
51.	I feel like a winner when I think about how well I'm doing in school.				
52.	School helps me learn what I really want to know.				
53.	My school work helps me to learn how to learn on my own.				
54.	I learn things quickly.				
55.	Most of what I am to learn I memorize.				
56.	I like to work at my own speed.				
57.	I have a lot of ways to learn things.				
58.	I can figure out how to learn what my teacher teaches me.				
59.	I create new ways of learning what my teacher expects me to learn.				

		inappropriate item	revise item	acceptable item	highly appropriate item
60.	I know how to study in order to be a good student.				
61.	When my teacher presents new information, I have a good way to learn it.				
62.	I try to find new ways of learning what my teacher teaches me.				
63.	To learn something, I just read it over and over again until I remember it.				
64.	I have ways for learning that help me perform well in school.				
65.	I reward myself when I do something I'm proud of.				
66.	I punish myself when I do things I am ashamed of.				
67.	When I have a problem I personally take steps to solve it.				
68.	When things aren't going right for me, I'm good at figuring out what's wrong.				
69.	I take care of my own problems.				
70.	If I have a problem I talk about it.				
71.	I succeed more than I fail at solving my personal problems.				
72.	I like to make decisions.				
73.	I am allowed to help choose my school learning experiences.				
74.	I trust my own decisions.				
75.	After my teacher assigns a lesson, I would like to be allowed to choose how I do it.				
76.	I push myself to do a good job.				
77.	At school I pretend I'm busy more than I really am.				

		inappropriate item	revise item	acceptable item	highly appropriate item
78.	I do my work without having to be told to do so by others.				
79.	I put off doing my homework as long as I can.				
80.	I do my schoolwork without my teacher having to make me do it.				
81.	I do more than the teacher expects me to do on assignments.				
82.	I try to get out of doing things I think will be difficult.				
83.	I make myself do even the hard lessons my teacher assigns.				
84.	I always try even if I don't know exactly what to do.				
85.	I tell myself I'm a successful person.				
86.	Before I begin working on an assignment, I think about being successful on it.				
87.	I practice having good feelings about myself everyday.				
88.	When I feel tense and upset, I rarely lose control.				
89.	I rarely lose control when I talk to people who have made me mad.				
90.	It's a natural thing for people to get angry at one another.				
91.	When someone hits me, I strike back.				
92.	I am responsible for what I do.				
93.	When someone makes me angry I have a personal plan that helps me control my actions.				
94.	I'm afraid I'll get into trouble for something I didn't do at school.				
95.	When I feel tense and upset, I have a positive plan to help me relax.				

		Inappropriate item	Poor item	Acceptable item	Highly appropriate item
96.	I try hard to control my anger.				
97.	I need rules to help me control my personal behavior at school.				
98.	I spend time being angry.				
99.	I get upset at myself for not getting "good grades" on a test.				
100.	I study myself to determine why I think like I do.				
101.	I think about what I want to teach myself each day.				
102.	I feel I am becoming a better thinker.				
103.	I like feel responsible for myself.				
104.	I'm good at knowing how long it will take me to do something.				
105.	I have a plan I use to judge my own progress on things I'm learning.				
106.	I think I lead a "happy" life away from school.				
107.	I don't feel I have to win to enjoy games.				
108.	Most of the work I have to do at school is too hard for me.				
109.	I feel a sense of purpose in my life (like "helping others"; "doing something to keep our school neat and clean").				
110.	I think I lead a "happy" life.				
111.	I feel "left out" by others when they choose people for games and activities.				
112.	My classmates think I'm an important member of this class.				
113.	I believe I can have any career I want.				

		inappropriate item	revise item	acceptable item	highly appropriate item
114.	I am good at remembering what my teacher expects me to know.				
115.	I like the way I look.				
116.	I don't tell people about my ideas because they will laugh.				
117.	I like the way I feel about myself.				
118.	I enjoy life at school.				
119.	I am talented.				
120.	I am a successful student.				
121.	I "down" myself (say "I'm no good!", "I never do anything right.").				
122.	I like myself.				
123.	Even if I feel I'm right, I "give in" to others just to win their approval.				
124.	Sometimes I let my friends talk me into stuff I shouldn't do.				
125.	I am proud of what I do.				
126.	I like to depend on myself for what I do.				
127.	I ask somebody for help when I don't know what to do in my school work.				
128.	When I am wrong, I am willing to admit my mistake.				
129.	I try to be like what people around me want me to be.				

APPENDIX H

PANEL MEMBERS

MEMBERS OF THE PANEL OF SELECTED EDUCATORS WHO ASSISTED WITH THE DEVELOPMENT OF THE SELF-DIRECTING PERCEPTUAL SCALE

Professors:

Dr. James L. Doud is the Director of the Iowa Principals Academy, and Professor of Education at the University of North Iowa, (Cedar Falls). He was largely responsible for Proficiencies for Principals, which spelled out the standards for quality Elementary and Middle schools. A major focus of his work was to help kids become more responsible learners.

Dr. Don Fuhr, Professor at Clemson University, Clemson, South Carolina still frequently works directly with public school students. Students under his charge have publicly affirmed that they saw him as their advocate and as a caring superintendent. He places much emphasis upon students taking responsibility for their actions. Moreover, his current work with student teachers encourages self-control and self-discipline in their teaching experiences. He has authored the book Choices, which deals with encouraging educators to provide more opportunity for students K-12 to do more for themselves while attending school.

Dr. Garry Landreth, one of our own professors at the University of North Texas, Denton, Texas, has done extensive

work with children and their perceptions. As is widely known, his expertise is in the area of Play Therapy. Teachers:

Mrs. Lou Ann Jackson, a fifth grade teacher at Mendenhall Elementary in Plano, Texas was also asked to judge the items as to their appropriateness for fifth graders. Mrs. Jackson has taught approximately 20 years.

Mrs. Grace Vaughan has taught for 26 years, 18 of which were in the fifth grade in public schools. She has 30 hours above her Masters Degree and has authored several published articles. Mrs. Vaughan resides in Denton, Texas.

Each of these individuals was asked to judge each item on the Perceptual Scale as to its appropriateness for fifth graders. Upon receiving the results from these five people, final revisions were made on the Self-Directing Perceptual Scale.

APPENDIX I

ADDITIONAL APPLICATION OF THE SELF-DIRECTING PERCEPTUAL SCALE

Additional Application of the Self-Directing Perceptual Scale

To further explore the practical application and interpretation of scores obtained from the administration of the Self-Directing Perceptual Scale, it was utilized as a test-retest instrument in the Spring of 1992 in a large middle school located in North Central Texas. The test was given to 216 sixth and seventh-grade students.

The school population from which this sample was drawn was largely Euro-American (6%) with relatively few Hispanics (2%) or African-Americans (2%). The students were from a high socio-economic level with 84% of the parents with college degrees.

It was predicted, by the investigator, that the instrument would measure if students were influenced by the educational program administered to them over the course of a 16-week term. The teachers had received training in the administration of this program by a business enterprise outside and apart from the school district.

The Self-Directing Perceptual Scale was found to be successful in assessing what the students had gained from the pre- and post- setting on several categories which were known to have been presented in the program administered. The results were deemed very useful in helping to assess the contributions of that program to the learning behaviors and understandings of the participating students.

Due to the nature of the program, it was believed that the number of select categories would be useful in assessing aspects of the program offered. The overall *t*-test was -1.48 which failed to exceed the critical 1.96 table value for a two-tailed test with 203 degrees of freedom. The actual level of significance reached was .139, which was high, as expected.

Three categories were examined using the *t*-test analysis. They included: Control Theory II, Self-Concept/Self-Evaluation and Responsibility. The *t*-test for Control Theory II was -1.85, which did not exceed the critical value of (df = 203) 1.96 for $p>.05$, but did reach the .07 level of significance. The *t*-test for Self-Concept/Self evaluation was -1.83 which also did not exceed the critical value of (df = 203) 1.96 for $p>.05$ level of significance, but also reached the .07 level of significance. Lastly, the category of Responsibility was measurable, but not as strong as the previous categories. The *t*-test for Responsibility was -1.13 which did not exceed the 1.96 critical table value (df + 203) for .05 level of significance ($p = .26$). The direction of the difference was assessed by comparing mean pre and posttest scores for the items stated below. The means of each of these items reflected an increase in students' perceptual understandings. Due to the time and effort involved, an individual *t*-test on every item or category was not appropriate at this time. Sample items from each category are given on the following page:

Category...CONTROL THEORY II

* 11. I tell myself I'm a successful person. (p = .09)

* 43. I have bad thoughts about myself.

* 50. I practice having good feelings about myself everyday. (p = .01)

* 54. I put myself down (say "I'm no good!," "I never do anything right.").

* 56. It hurts my feelings when other kids criticize me.

* 79. I can control my feelings.

*108. When someone hits me, I hit back.

* .07 level of significance

Category...SELF-CONCEPT/SELF-EVALUATION

* 17. I am a successful student. (p = .06)

* 37. I believe I can have any career I want.

*128. I am talented.

*113. I have a plan I use to judge my own progress on things I'm learning.

* 87. I would like to change how I feel about myself.

* 19. Even if I feel I'm right, I "give in" to others just to win their approval.

* .07 level of significance

Category...RESPONSIBILITY

* 14. I am responsible for what I do.

* 53. I do my schoolwork without my teacher having to make me do it.

* 61. If something goes wrong in life it is usually someone else's fault instead of my own.

* 77. I know what is right or wrong when I must decide what to do.

* 80. It is people around me that cause me to do what I do.

* 90. I am responsible for everything I do.

* .26 level of significance (not as strong, but measurable)

PLEASE NOTE: The purpose of administering The Perceptual Scale was to determine if it would pick up change as a result of what a special program offering had for the benefit of students. The test developer did not expect students to respond and show change on every item because the program offered would not be geared to all items on the Scale. So the investigator surveyed the materials to be taught and predicted that her scale would pick up approximately 20 items and show significant (statistically), positive differences in behaviors of students. In fact, the investigator believes the categories influenced by the program presented were timely, beneficial, and worthy. It seems that the program offered measured up when it comes to certain, selected needs of youth.

APPENDIX J

IQ INFORMATION

IQ Information

The experimental and control group's IQ scores were retrieved from the students' cumulative folders and were categorized according to Terman's famous IQ classification scheme (as cited in Thompson, 1952, p. 386). Remarkably, the students in the experimental and control groups fell almost perfectly in a bell-shaped curve with the majority of each group having average IQ scores. When comparing the dispersement of the IQ scores between the experimental and control groups it became evident that there was a substantially higher number of children with average IQs (90-110) in the experimental group (n = 29) than in the control group (n = 18).

To discover if the experimental group (with average IQ scores) gained more strategies than the control group(with average IQ scores): the students were matched on IQ scores and then the total number of posttest (Zimmerman and Martinez-Pons' Interview) strategies were compared. In the average IQ range, 9 of the 21 experimental and 9 of the 18 control students could be matched on IQ. These nine were used in this comparison for the average number of strategies acquired for the average IQ group. In this comparison, the experimental group used 50% more strategies than the control group.

When matching the experimental and control group students on IQ scores, most of the time there was a 1-1

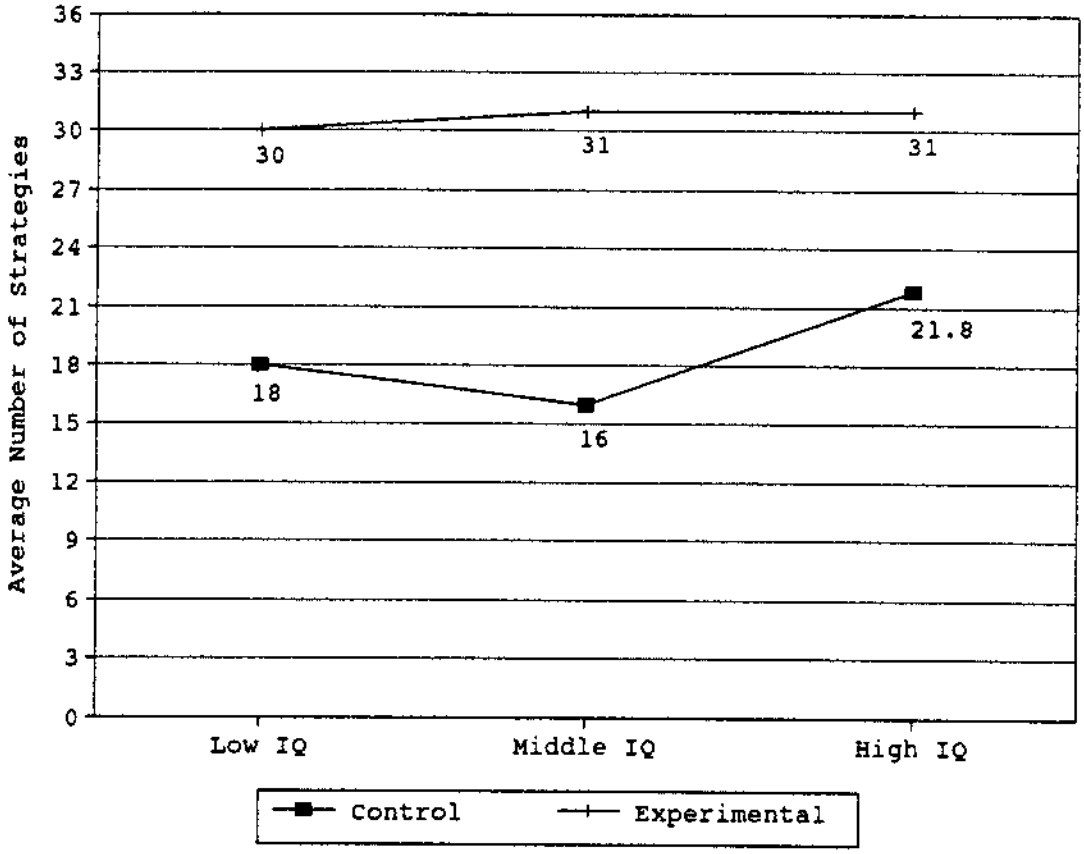
correspondence. Occasionally, a 2-1 or 3-1 correspondence would occur (meaning two people in the experimental group would have, for example, 103 as their IQ and 1 person in the control group would have an IQ of 103). In this situation, the one's column of the student identification number was examined. The numeral in the one's column of each of the students with the same IQ was written on a piece of paper. Another party selected one of these numbers randomly thereby selecting which of the group would be the one to be matched with a score in the other group.

In comparing the higher IQ range, six of the 12 experimental and six of the 14 control students were matched on IQ to be used in this comparison. Interestingly, enough, when the same comparison was made with a higher IQ bracket (120-140) the experimental group reported using only 30% more strategies than the control group. And when the same comparison was made with the lower IQ bracket (80-90) the experimental group used 40% more strategies than the control group. Evidently, regardless of IQ level, the experimental group gained substantially more strategies than the control students.

Furthermore, when one compares the high, middle and low IQ brackets, the average kids appeared to gain the most (50% more than their control counterpart) and the low group gained 40% more than their control counterpart and the high group gained approximately 30% more than their control

counterpart. (See Chapter V, p. 95 for conclusions and implications.)

Learning Strategy Usage As
Reported By Experimental and Control Groups
According to IQ Scores



APPENDIX K

NESTED DESIGN

Computational Procedures for a Type CRH-28(A) Design

(i) Data and notation [Y_{ijk} denotes a score for experimental unit i in treatment combination jk; $i = 1, \ldots, n$ experimental units (s_i); $j = 1, \ldots, p$ levels of treatment A (a_j); $k = 1, \ldots, q$ levels of treatment B(b_k)]:

ABS Summary Table Entry is Y_{ijk}

a_1 b_1	a_1 b_2	a_1 b_3	a_2 b_4	a_2 b_5	a_2 b_6
203	173	330	219	108	99
512	194	157	319	96	51
199	107	99	100	55	58
228	106	280	105	70	151
287	121	172	356	68	98
365	317	252	88	106	117
275	338	200	80	137	151
174	258	198	232	87	80
193	200	67	191	106	116
↓	↓	↓	↓	↓	↓
237	173	200	55	96	44
6995	4828	5204	4262	2023	2088

AB Summary Table Entry is $\sum_{i=1}^{n} Y_{ijk}$

	b_1	b_2	b_3	b_4	b_5	b_6	
	n=25						
a_1	6995	4828	5204				17027
a_2				4262	2032	2088	8382
							25409

Computational procedures

(ii) Computational symbols:

$$\sum_{i=1}^{n}\sum_{j=1}^{p}\sum_{k=1}^{q_{(j)}} Y_{ijk} = 203 + 173 + 330 + \cdots - 44 \qquad (1)$$

$$\frac{\left(\sum_{i=1}^{n}\sum_{j=1}^{p}\sum_{k=1}^{q_{(j)}} Y_{ijk}\right)^2}{npq_{(j)}} = [Y] = \frac{(25409)^2}{(25)(2)(3)} = \frac{645617281}{150} \qquad (2)$$

$$\sum_{i=1}^{n}\sum_{j=1}^{p}\sum_{k=1}^{q_{(j)}} Y_{ijk}^2 = [ABS] = (203)^2 + (173) + (330)^2 + \cdots + (44)^2 \qquad (3)$$

$$\sum_{j=1}^{p}\frac{\left(\sum_{i=1}^{n}\sum_{k=1}^{q_{(j)}} Y_{ijk}\right)^2}{nq_{(j)}} [A] = \frac{(17027)^2}{(25)(3)} + \frac{(8382)^2}{(25)(3)} \qquad (4)$$

$$\sum_{j=1}^{p}\sum_{k=1}^{q_{(j)}}\frac{\left(\sum_{i=1}^{n} Y_{ijk}\right)^2}{n} = [AB] = \frac{(6995)^2}{25} + \frac{(4828)^2}{25} + \cdots + \frac{(2088)^2}{25} \qquad (5)$$

Note: In step 2, n = 25 (In actuality, this n represents the number of members in each classroom. In this present experiment the n's of the 6 classrooms were unequal, therefore, for explanatory purposes n = 25.)

n = number of people in each classroom (25)

p = level of treatment experimental/control (2)

q = levels of treatment classrooms (3)

(iii) Computational formulas:

$$SSTO = [ABS] - [Y]$$

$$SSA = [A] - [Y]$$

$$SSB(A) = [AB] - [A]$$

$$SSWCELL = [ABS] - [AB]$$

ANOVA Table for Type CRH-28(A) Design
Model 1, A Fixed, B(A Fixed)

Source	SS	df	MS	F
1 A (Condition Exp/Control)	531591.56	p - 1 = 1	531591.56	[1/3]77.02*
2 B(A) (Classrooms)	45321.99	$p(q_{(j)} - 1)=4$	11330.50	[2/3]1.64
3 WCELL	1007754.76	$pq_{(j)}(n-1)=146$	6902.43	
4 Total	1584668.21	$npq_{(j)}-1= 151$		

* $p<.001$

For illustrative purposes the computational procedures for a Type CRH-28(A) Design (nested treatment) appears on the previous two pages. Statistical data appearing in the respective formulas were gleaned from computerized print-out sheets containing both raw data derived from the instruments used in this present study and statistical data emerging from the formulas used to process it. Because of the volume of statistical calculations, it is not feasible to provide all of the processed information here in detail. However, all essential statistical data are presented in tables elsewhere in this study.

For a complete discussion of the various types of hierarchical designs, including the specific one chosen for this study, this investigator recommends Kirk (1982, chap. 10).

APPENDIX L

STUDENT'S RAW SCORES ON EACH INSTRUMENT

ID	Interview Control Pretest	Interview Control Posttest	ID	Perceptual Control Pretest	Perceptual Control Posttest	ID	Interview Experimental Pretest	Interview Experimental Posttest	ID	Perceptual Experimental Pretest	Perceptual Experimental Posttest	ID	Guglielmino Experimental Pretest
101	167	219	101	399	407	101	112	203	101	454	490	101	226
102	258	319	102	464	476	102	91	512	102	432	474	102	227
103	110	100	103	430	410	103	81	199	103	363	403	103	193
104	145	105	104	358	360	104	77	228	104	359	380	104	201
105	73	96	105	387	371	105	97	239	105	439	398	105	208
106	245	356	106	489	509	106	77	287	106	372	362	106	179
107	91	88	107	450	449	107	216	365	107	481	467	107	234
108	313	80	108	380	365	108	59	275	108	339	370	108	184
109	181	232	109	367	330	109	88	174	109	264	316	109	156
110	215	191	110	453	465	110	81	193	110	355	399	110	155
111	277	133	111	409	445	111	96	178	111	433	425	111	215
113	92	111	113	469	485	112	33	143	112	341	360	112	167
114	154	152	114	457	482	113	103	168	113	245	323	113	157
115	155	143	115	318	319	114	193	390	114	308	315	114	181
116	358	319	116	307	272	115	142	371	115	376	401	115	195
117	64	88	117	421	439	116	47	229	116	445	477	116	247
118	133	126	118	367	356	117	113	314	117	395	451	117	201
119	102	168	119	491	479	118	45	230	118	387	427	118	203
120	55	45	120	302	329	119	106	311	119	344	362	119	159
121	56	98	121	448	470	120	122	196	120	425	334	120	209
122	77	107	122	380	328	121	49	104	121	358	398	121	203
123	188	152	123	461	440	122	206	324	122	426	400	122	198
125	88	97	125	424	442	123	63	106	123	432	468	123	210
126	95	67	126	387	363	124	48	142	124	473	496	124	247
127	54	46	127	358	379	125	51	93	125	409	432	125	207
128	65	58	128	422	407	126	135	367	126	438	390	126	227
129	130	84	129	376	357	129	33	205	129	229	282	129	93
130	51	59	130	401	383	130	152	212	130	362	377	130	234
131	93	117	131	460	436	131	107	237	131	343	398	131	170

ID	Interview Control Pretest	Interview Control Posttest	ID	Perceptual Control Pretest	Perceptual Control Posttest	ID	Interview Experimental Pretest	Interview Experimental Posttest	ID	Perceptual Experimental Pretest	Perceptual Experimental Posttest	ID	Guglielmino Experimental Pretest
132	114	131	132	377	450	201	55	173	201	414	402	201	225
133	44	120	133	320	328	202	92	194	202	369	332	202	206
134	44	55	134	319	370	203	47	107	203	430	388	203	212
201	142	108	201	437	458	204	47	106	204	433	392	204	215
202	94	96	202	474	504	205	91	235	205	371	373	205	179
203	62	55	203	442	432	206	41	121	206	378	395	206	193
204	79	70	204	447	472	207	129	317	207	409	366	207	221
206	205	187	206	388	364	208	82	338	208	372	369	208	200
207	163	68	207	426	378	209	182	258	209	431	494	209	214
208	142	106	208	460	436	210	82	200	210	294	331	210	243
209	84	137	209	444	420	211	35	481	211	388	407	211	190
212	64	87	212	414	398	213	65	237	213	364	355	213	227
213	174	106	213	358	353	214	119	212	214	435	427	214	236
214	123	110	214	478	469	215	71	136	215	336	363	215	193
215	71	47	215	351	388	216	89	180	216	386	370	216	175
216	77	76	216	320	341	217	79	208	217	421	429	217	220
217	58	45	217	363	393	218	65	103	218	340	361	218	168
218	109	106	218	356	385	219	64	172	219	315	302	219	189
219	68	28	219	421	347	220	135	254	220	432	446	220	228
223	138	131	223	407	422	221	140	173	221	357	374	221	198
224	194	109	224	374	328	222	56	75	222	396	384	222	176
227	142	96	227	436	371	223	144	375	223	359	431	223	187
228	49	48	228	366	339	224	106	173	224	339	329	224	173
229	147	111	229	399	423	301	73	330	301	391	416	301	221
230	97	96	230	426	397	302	48	157	302	372	384	302	178
301	93	99	301	223	298	304	37	99	304	273	314	304	166
302	99	51	302	388	322	305	85	280	305	339	423	305	178
303	85	58	303	406	420	307	169	388	307	351	368	307	231
304	69	151	304	358	404	308	121	172	308	392	397	308	209

ID	Interview Control Pretest	Interview Control Posttest	ID	Perceptual Control Pretest	Perceptual Control Posttest	ID	Interview Experimental Pretest	Interview Experimental Posttest	ID	Perceptual Experimental Pretest	Perceptual Experimental Posttest	ID	Guglielmino Experimental Pretest
305	71	126	305	404	445	310	42	252	310	344	329	310	260
306	159	98	306	374	337	311	113	200	311	352	322	311	190
307	97	117	307	326	422	312	125	198	312	419	372	312	206
309	117	151	309	360	370	313	79	67	313	406	417	313	206
310	87	80	310	360	383	314	75	129	314	305	310	314	154
312	147	116	312	362	376	315	166	323	315	307	410	315	157
313	79	99	313	415	412	316	124	186	316	410	492	316	194
314	69	90	314	384	346	317	74	256	317	332	346	317	188
315	61	74	315	425	422	318	122	99	318	411	430	318	224
316	47	84	316	388	378	320	177	544	320	440	366	320	190
317	80	99	317	375	372	321	75	118	321	411	475	321	221
318	32	34	318	375	372	322	98	225	322	430	449	322	240
319	71	89	319	346	338	323	113	173	323	451	459	323	215
320	117	111	320	402	430	324	100	121	324	375	402	324	162
322	69	37	322	289	343	325	209	404	325	463	511	325	230
323	99	115	323	470	499	326	89	283	326	434	486	326	237
324	44	84	324	347	327	327	92	200	327	374	302	327	204
325	98	81	325	410	459								
326	45	44	326	409	422								
n =	77	77		77	77	n =	75	75		75	75		75

APPENDIX M

DESCRIPTIVES ON EACH TEST SETTING

Obtained Scores for the Experimental and Control Groups for each Measurement

Typically research statistics of this type are based upon the obtained means. Most of the data, for the purposes of this study, however, were utilized as raw scores (see Appendix L, p. 173). In this research, Hypotheses 1 and 3 are analyzed in a nested design using raw score as the basis for the tabulation of data. Raw scores were also used as the analysis for Hypotheses 5, 6, 7, and 8.

Interview		Mean	St. Dev.	Min	Max	N
Experimental Group	Pretest	96.60	44.35	33.00	216.00	75
	Posttest	227.03	102.35	67.00	544.00	75
Control Group	Pretest	113.04	64.24	32.00	358.00	77
	Posttest	108.74	60.46	28.00	356.00	77

Perceptual		Mean	St. Dev.	Min	Max	N
Experimental Group	Pretest	381.04	53.05	229.00	481.00	75
	Posttest	394.33	54.13	282.00	511.00	75
Control Group	Pretest	395.25	51.45	223.00	491.00	77
	Posttest	397.61	51.45	272.00	509.00	77

Guglielmino		Mean	St. Dev.	Min	Max	N
Experimental Group	Pretest Only	201.117	28.737	93.00	260.00	75

It should be remembered that the $\bar{x}$ scores, which appear large in this study are due to the 5-point Likert Scale on the Perceptual Scale and on the Guglielmino. On both instruments a 5 was considered the "best" answer, thereby rendering high scores in the 600's and 300's respectively. The wording of several items on each scale had been reversed. On these items a 1 was considered the "best" answer. The computer programs used for scoring these items were programmed to accommodate these reversals.

APPENDIX N

SERENDIPITOUS FINDING

FINDING

1. A large proportion of the students who participated in the experimental group developed an awareness of their own learning. Wheretofore the major emphasis upon teaching was imparting information and the student feeling that he had finished his learning task by responding to it in some fashion, it became clear to most students that after assignments were made, they now had a serious personal responsibility of determining, selecting and learning certain strategies from the pool of ideas provided for this purpose.

CONCLUSION

1. It is likely that extended student awareness of their own learning did not occur as a consequence of training in any general strategies provided by the teachers and research investigator, but as a consequence of directed teaching that assisted them in changing perspective in relation to particular activities. By getting children to change their perspective from "I have been given an assignment to do the way the teacher prescribes (wants)" to... "I have been given an assignment but I now have a major responsibility of determining how I can best do it by drawing on my previous strategies or acquiring new ones that accompany the assignment." Getting children to change their perspective about assignments, they reflect on how they are in need of acquiring strategies for learning what their teachers are

teaching them. Thus, it can be safely concluded that due to the emphasis upon student selection of strategies for learning and the accompanying metacognitive dialogues, this combination served to develop a more self-directing perspective; --students used a variety of strategies for the same assignment; they sought to increase their selected strategy repertoire over time; and, they discovered some strategies worked better for them than did others.

EDUCATIONAL IMPLICATION

1. Since the experimental group demonstrated a statistically significant increase ($p>.001$) in the number of strategies they held from the beginning of the experiment until its end; and, the control group did not significantly add to their learning strategies whatsoever, teachers should wittingly encourage all youngsters in their classes to knowingly seek out ways of learning that they can cognitively refer to time and time again for learning purposes. The larger the number of learning strategies one possesses, the more likely he can pull an appropriate one from his cognitive map for future learning purposes.

    1. The classroom teacher should continuously focus on the children's ideas of learning throughout the year.
    2. Asking children how they would teach a given idea to someone else, and in several instances giving them an opportunity to do so, not only reinforces

their own beliefs about a learning strategy but provides all other learners with opportunity to witness firsthand strategies which they can select for use for their own learning purposes.

APPENDIX O

STRATEGIES USED

IN THIS STUDY

Strategies Used In This Study

- Active Listening
- Fixations
- Timed Assignments
- Setting Goals
    - Reading Rate
    - Spellings
    - Personal
- Note-taking Around a Centre
- Study Environments
- Making Connections
- Acrostics
- Acronyms
- Editor's Table
- Cooperative Learning Activities
- Dealing With Uncertainty in Reading

APPENDIX P

A SAMPLE LISTING OF SEVERAL STUDENT'S RESPONSES FROM THE ZIMMERMAN AND MARTINEZ-PONS' INTERVIEW FOR ILLUSTRATIVE PURPOSES

RESPONSES TO ZIMMERMAN AND MARTINEZ-PONS'
LEARNING STRATEGY INTERVIEW SCHEDULE

Student #1

PRIOR TO TREATMENT	AFTER TREATMENT
316-2-116	317-2-116
1. - write it down - ask teacher for help	1. - take notes - study - use time wisely - mom - think about it
2. - use a handout that says how to do it	2. - brainstorm - map out ideas - make a rough draft - correct spelling and punctuation
3. - look in the book - ask the teacher	3. - ask teacher - ask classmates - try - study in a quiet place - cut off TV - go somewhere else - ask grandmother to keep nephew away - take a 2 minute break - set goals, do the first 10, then do the last 10
4. - take notes - ask the teacher	4. - take notes - study at school - study at home - look in the book - read it over
5. - turn off TV - find a quiet place - ask mom	5. - think about grades - how mom'll feel - think about weekly reports - try really hard - go to a quiet place - cut TV down - tell people to let me study - tell my grandmother to make my nephew leave me alone

RESPONSES TO ZIMMERMAN AND MARTINEZ-PONS'
LEARNING STRATEGY INTERVIEW SCHEDULE

Student #2

PRIOR TO TREATMENT	AFTER TREATMENT
316-1-121	317-1-121
1. - ask parents for help	1. - take notes - make a web - study everyday until the test
2. - ask parents for help	2. - make a web - make a first draft - check for errors
3. - ask parents for help	3. - study with a partner - check my answers on a calculator - ask my teacher to help me
4. - study it	4. - study with a friend - read the chapter - work with a partner
5. - ask parents for help	5. - ask parents for help
6. - ask parents for help	6. - study everyday - go to the library - get books

RESPONSES TO ZIMMERMAN AND MARTINEZ-PONS'
LEARNING STRATEGY INTERVIEW SCHEDULE

Student #3

PRIOR TO TREATMENT	AFTER TREATMENT
316-1-108	317-1-108
1. - take notes - pay attention - ask teacher - ask mom	1. - take notes - draw diagrams - pay attention - ask questions
2. - decide on character, plot, setting - web - go to parents - go to teacher	2. - think about it - brainstorm - read directions - write down important words - make a web - draw an outline - rought draft - correct spelling, punctuation, grammar - make final copy - ask adult for help - use dictionary, encyclopedia, reference book
3. - go to my dad	3. - check my work (readable, correct) - study my book - ask parents - ask teacher
4. - go through chapter	4. - take notes from the chapter - study my notes - get people to drill me
5. - play first, then do homework	5. - think about consequences - set goals
6. - look in the encyclopedia	6. - find a quiet place so I can study

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