Draw to learn: an analysis and evaluation of a high school language arts curriculum technique designed to enhance creativity and self-expression.

Louise Earle Loomis
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DRAW TO LEARN

AN ANALYSIS AND EVALUATION OF A HIGH SCHOOL LANGUAGE ARTS CURRICULUM TECHNIQUE DESIGNED TO ENHANCE CREATIVITY AND SELF-EXPRESSION

A Dissertation Presented

by

LOUISE EARLE LOOMIS

Submitted to the Graduate School of the University of Massachusetts Amherst in partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

May 1994

School of Education
DRAW TO LEARN

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Louise Earle Loomis,
May, 1994
ABSTRACT
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MAY 1994
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The "Draw to Learn" study was undertaken to determine if a combination of drawing and writing in a high school language arts setting would enhance creativity and self-expression.

The intervention described in this study took place in a 9-12 high school in Hartford, Connecticut, during April and May of 1993. It consisted of six classroom lessons and four measurements: the Torrance Test of Creative Thinking (T.T.C.T./non-verbal), the Sheridan RESCORE writing analysis test, an opinion survey questionnaire and a three-judge panel review of randomly selected student journals.

Outcomes were mixed. Results from the T.T.C.T. and the RESCORE were the opposite of expectations. The T.T.C.T. creativity index dropped significantly after the intervention and the RESCORE results measured no general increase in writing between the first and last sessions of "Draw to Learn."

Other results were more promising. Anecdotal material from RESCORE, data from the opinion survey questionnaire and the judges'
responses indicated some enhancement of creativity and self-expression from the intervention, with a noticeably stronger performance in drawing than in writing. It was speculated that time constraints could have been involved in producing both this discrepancy and the negative results from T.T.C.T. and RESCORE. The possibility that the data were reflecting a population undergoing change was also raised.

Several areas of further research are suggested by the study, including uses of the model with other populations, different kinds of drawing activities, and longer time frames.
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CHAPTER 1

INTRODUCTION

1.1 Background

This report describes a study which sought to demonstrate that a series of drawing and writing activities called "Draw to Learn" would enhance creativity and self-expression in a high school level language arts setting.

The study was based on the concept that people are creative by nature, and that each individual has the capacity to increase this natural creativity through deliberate instruction and practice.

The concept that creativity is a universal and modifiable human characteristic is relatively new, dating back only to the middle of this century. Before then, creativity was considered to a congenital attribute of specially endowed people who received the gift in set and immutable amounts. Creativity was not a subject for serious study and research.

It is difficult to date precisely when the concept of creativity began to change. Several individuals studied and taught about creativity in the early part of this century. Among them are: R. M. Simpson, who described creativity as "the initiative to break from usual thought sequences" in an article, "Creative Imagination," published in 1922 in the American Journal of Psychology (Biondi & Parnes, 1976); Hughes Mearns, author of The Creative Youth, who taught courses in creativity at the Lincoln School of Columbia University for several years in the 1920s (Mearns, 1929); J. Rossman, who studied
inventors (1931); and Catherine Patrick (1944), who examined "Whole and Part Relationship in Creative Thought." The latter based her research on the work of Graham Wallas, whose four-stage model of the creative process became a permanent contribution to the field of creativity (Shallcross, 1985).

Wallas' four stages: preparation, incubation, illumination, and verification, were "generally accepted as the way creativity works" (Parnes, 1992) when he first presented them. Although many new ideas, definitions, programs, tests, theories, etc., about creativity have been developed in the intervening years, the model has enjoyed continuous use since Wallas first described it in 1926.

The 1950s are now generally accepted as the period when the old paradigm of creativity began to change (Shallcross, 1985; Parnes, 1992), and Alex Osborn and J. P. Guilford are generally recognized as the major agents of that change (Shallcross, 1986). Osborn became involved with creativity through his work in advertising, whereas Guilford, an academician, promoted and developed research about creativity in the field of psychology.

From the beginning, Alex Osborn believed that creativity could be increased with deliberate strategies and practice. His first book, How to Think Up (1942), was a short tome written to increase idea production among members of his advertising agency, Batton, Barton, Durstine, and Osborn. His colleague, Bruce Barton, encouraged Osborn to publish the little book to improve production during World War II. How to Think Up was well received and Osborn, thus encouraged, made a life-work of creativity. He wrote several more books, enhanced the productivity of many companies, and was the founder of the Creative
Education Foundation (1954), the annual Creative Problem Solving Institute (1955), and the Journal of Creative Behavior (1967). Osborn used the term "brain storm" for his technique for increasing idea production. Brain storm originally meant "violent mental derangement," but Osborn's more positive second definition and the technique itself have become part of common language and practice (True, 1971).

While Osborn was encouraging creativity in business, J. P. Guilford was deploring the dearth of studies and research in creativity. In his 1950 inaugural address as President of the American Psychological Association, he stated:

The neglect of this subject by psychologists is appalling. The evidences of neglect are so obvious that I need not give proof. But the extent of the neglect I had not realized until recently (Biondi & Parnes, 1976).

The "extent of the neglect" was demonstrated by the scant 186 articles about creativity among 121,000 titles in psychological research from 1927 to 1950, and by the publishing of only two psychology textbooks with chapters on creativity within the same time period (Biondi & Parnes, 1976).

Guilford followed his own advice and made many contributions to the field of creativity. He is best known today for his exploration of divergent and convergent thinking and for his model for organizing thinking activities called the "Structure of the Intellect" (Biondi & Parnes, 1976).

The situation which Guilford deplored did indeed begin to change as he and Osborn continued their efforts and as others joined and expanded the field. The history of their work has recently been gathered and organized by Sidney J. Parnes, another pioneer in
creativity, in *A Source Book for Creative Problem Solving* (1992). Parnes has assembled an impressive array of individuals and programs in this book. The book is a tribute to the progress of the field during the past half-century and a valuable resource for the study of creativity.

Although the field of studies and research in creativity has grown tremendously, teaching about creativity and its enhancement is far from universal. A 1987 survey of American Colleges and Universities reported only 76 institutions (of 1188 respondents) conducting formal courses in creativity (McDonough & McDonough, 1987). Fortunately, there is a demand for creativity today which could stimulate more instruction and research. There is a perceived need for people who can cope creatively with current social, economic, and environmental situations at both global and local levels.

At the global level, improvements in medicine, agriculture, and technology, while benefitting many people, have resulted in vast increases in population and resource depletion which threaten the sustainability of life on earth (Ehrlich, 1990). Thinking globally about survival is a new experience for the human race, the necessity for which is not generally appreciated. Wallas had this concern after World War I, and it motivated his work in creative thinking (Wallas, 1926, pp. 23-29). Rogers had a similar awareness in 1952 arising from concerns about nuclear war:

> Unless man can make new and original adaptations to his environment as rapidly as his science can change the environment, our culture will perish. Not only individual maladjustment and group tensions but international annihilation will be the price we pay for a lack of creativity (Rogers, 1954, in Isaksen, 1987, p. 3).
The same changes, at local levels, have transformed many workplaces causing employers to look for different skills and competencies in their employees. Creative people are needed for both educational and problem-solving projects to respond to these situations.

Creativity emerges as a desired and marketable skill in a recent study by the United States Department of Labor. Realizing that increasing numbers of high school graduates were inadequately prepared for employment, the Department established the Secretary’s Commission for Achieving Necessary Skills (SCANS) to determine what students should be learning to equip them for employment.

The SCANS Report, published in 1991, identified three clusters of Foundation (i.e., basic) Skills and five Workplace Competencies which high school graduates should possess in order to be adequately prepared for employment. (These Skills and Competencies are summarized in Figure 1). Creativity is an important component of the Foundation Skills. Three aspects of creativity - creative thinking, problem solving, and imagining - are all included in the Foundations Skills cluster called “Thinking Skills.”

Creativity also appears in the New Standards Project, which is another response to the demands being made on American schools by changing world conditions. Directed by Lauren Resnick of the Learning and Research Center at the University of Pittsburgh, and Mark Tucker, President of the National Center on Education and the Economy, the New Standards Project intends to establish national content and assessment standards for American schools. Performance tasks, projects, and
The know-how identified by SCANS is made up of five competencies and a three-part foundation of skills and personal qualities needed for solid job performance. These include:

COMPETENCIES. Effective workers can productively use:

- **Resources**: allocating time, money, materials, space, staff;
- **Interpersonal Skills**: working on teams, teaching others, serving customers, leading, negotiating, and working well with people from culturally diverse backgrounds;
- **Information**: acquiring and evaluating data, organizing and maintaining files, interpreting and communicating, and using computers to process information;
- **Systems**: understanding social, organizational, and technological systems, monitoring and correcting performance, and designing or improving systems;
- **Technology**: selecting equipment and tools, applying technology to specific tasks, and maintaining and troubleshooting technologies.

THE FOUNDATION. Competence requires:

- **Basic Skills**: reading, writing, arithmetic and mathematics, speaking and listening;
- **Thinking Skills**: thinking creatively, making decisions, solving problems, seeing things in the mind’s eye, knowing how to learn, and reasoning;
- **Personal Qualities**: individual responsibility, self-esteem, sociability, self-management and integrity.


Figure 1.1 Workplace Know-How
portfolios (all creative activities) are being considered for both content delivery and assessment. Pilot testing has begun with some performance tasks. Students have not, in general, done well, and Resnick attributes their poor results to lack of experience with creative thinking:

They're not encouraged to be creative, yet the upper levels of the [scoring] rubric really call for creativity and personal response on the part of the student (Lockamay & Schnitzer, 1992).

Resnick links creativity with personal response, which, in this study, is called self-expression. Both creativity and self-expression will be measured in the "Draw to Learn" program which constitutes the study's intervention.

1.2 The Problem

While important for success in the workplace and at school, creativity and self-expression play a vital role at a deeper level of human functioning. Research in education has shown that creativity and self-expression are essential for the development of language, cognition, and social development. Many activities in children's lives today do not invite creativity and self-expression. Imaginative play, which embodies both (Rogers & Sawyers, 1990; Singer, 1973) has, in many instances, been sacrificed to hours of television watching and electronic games.

Television watching is a major recreation among children today, occupying more of their time than school (Healy, 1990). Yet television watching requires neither personal self-expression nor creativity on the part of the viewer. While it is true that the popular electronic games do demand responses, those responses are determined by the equipment not by the viewer. In neither situation
(i.e., television watching and playing electronic games) is expression or validation of the individual's personality actively sought.

The ready availability of finished goods in today's consumer products society also deprives children of opportunities for creativity and self-expression. Because few things are made at home, children miss the opportunity to produce goods for their families, and to express themselves through these accomplishments. They are deprived of both the challenges, frustrations, and messes of process and the pride and joy of achieving expertise. Children today are "process deficient" and lack opportunities in their daily lives for creativity and self-expression.

In addition, fast-paced electronic pastimes and ubiquitously available consumer goods habituate youngsters to quick results. Thus, they are often bored by and impatient with the time-consuming, reflective, and thoughtful processing that is involved in creative and self-expressive activities (Healy, 1990; Miezdian, 1991).

Because opportunities for self-expression are decreasing in children's informal education at a time of increasing demand for competency in self-expression in the workplace, there is a need to provide students with self-expressive learning experiences and to teach them about this need. Once students are aware of the importance of self-expression, they can take some responsibility for developing it in themselves.

The "Draw to Learn" program which has been used in this study provides opportunities for secondary students to engage in creative and self-expressive language arts activities. As its name indicates, this program involves drawing as part of the learning process.
Drawing is not customarily used for general instruction at the secondary level, nor is it a common tool for ordinary self-expression among adults. Writing is the time-honored, commonly practiced and generally anticipated form of recorded self-expression. Competency in writing is an expected educational outcome. Such is not the case for drawing and its use in secondary and higher education has traditionally been restricted to art classes.

The situation is quite different in early childhood education where drawing is usually expected and encouraged. Research about children’s drawing is on-going. Studies, so far, have shown that drawing plays an important role as an instrument for the expression and communication of thought and for the development of reading and writing skills among children from pre-school age up through the early stages of literacy (Buxton, 1982; Cohen & Gaine, 1977; Gardner, 1980; Hubbard, 1989; Skupa, 1985; Neu, 1991; Vygotsky, 1979). Vygotsky, for example, describes drawing as: "graphic speech that arises on the basis of verbal speech and functions as a preliminary stage of writing" (Vygotsky, 1979, p. 113).

Drawing plays an important part in the pre-school programs of the Commune of Reggio Emilia, in Northern Italy. The system there is internationally famous for its integration of drawing and the other arts into early childhood education. Opportunities for creativity and self-expression abound. Through a synthesis of teacher guidance, student interests, and ample resources, children engage in authentic, life-based learning. They participate in complex interdisciplinary projects and create remarkably elaborate and sophisticated products.
Many children teach themselves how to read and write without specific instruction (Firlik & Firlik, 1992).

In addition to its use in early childhood education, drawing has also been accepted as an important and effective therapeutic tool for troubled people of all ages. The field of art therapy, which has developed during the past fifty years, has demonstrated that drawing is helpful for psychotherapy, for physical healing and for coping with death and dying (Betensky, 1973; Dalley, 1984; Naumberg, 1973; Siegel, 1986; Kubler-Ross, 1981). Otherwise, drawing has traditionally been considered to be an art form reserved for the specially talented or as a pleasant, personal hobby.

In the 1970s, the situation began to change. Art therapists started suggesting that drawing could benefit everyone’s mental health and that drawing should become part of everyday learning in school. In 1973, Naumberg stated:

Its (i.e., art therapy) value to general education, however, is still being neglected. This image making power of man’s unconscious bypasses the verbal thinking which traditionally and currently is overemphasized in formal educational training. True growth and development of students of all ages has been and continues to be obstructed by the continuous imposition of verbal techniques and knowledge. (p. vii)

Although drawing is not yet generally used as Naumberg suggested, there are numerous books and related workshops available to the general public which promote the use of drawing for cognitive and emotional development and self-expression (Cappachione, 1985; Edwards, 1987; McMurray, 1988). Several activities in the "Draw to Learn" program are derived from these works.

Brain research in the 1970s, which revealed a division of labor between the two hemispheres of the neo-cortex, also had an impact on
perceptions of the role of drawing in cognitive activities. Roger Sperry (Nobel laureate, 1981), and his colleagues at the California Institute of Technology, performed experiments which revealed preferences for different functions in the two hemispheres. The left hemisphere was identified as the generator and manager of speech and the logical and serial propositions used in language, mathematics, and music. The right was found to have "superior mastery of visual, auditory, and haptic domains," thus being more aware of shapes, colors, and sounds and more engaged with emotional and social mediation (Sperry, 1982).

Research on the functions of the hemispheres (now called "lateral dominance" or "hemisphericity") is a large and popular field and generates many papers each year. (There were 149 entries in Psychological Abstracts in the first six months of 1992.) Numerous applications of knowledge about lateral dominance have also appeared, including some which, as in this study, combine drawing and writing. Their originators claim that drawing accesses the power of the right hemisphere while writing accesses the left: the combination of the two thus producing a more holistic kind of thinking. Some who favor the combination of drawing and writing claim it enables learners to organize and memorize information more rapidly (Buzan, 1983, p. 110). Others, such as the aforementioned Cappachione (1985), Edwards (1987), and McMurray (1988), view the combination as an expansion of the benefits of art therapy.

Mindmaps (Buzan, 1983), webs (Freedman & Reynolds, 1980), clusters (Rico, 1983) and graphic organizers (Black & Black, 1990) are four terms that are used for the process that combines drawing and
writing in order to record, organize, and memorize information. Shapes, lines, words, and little drawings are executed, with or without color, to represent an individual’s grasp of a particular body of information. The use of this technique is gradually spreading throughout many professions (including education) and training continues in workshops and seminars, nationally and internationally.

Drawing and writing are used differently and for different purposes in the "Draw to Learn" program. Although thinking and learning, rather than therapy, are the focus, the approach resembles that of Cappachione, Edwards and McMurray. Students draw pictures and/or designs and then they write about what they were thinking and doing. During the process, they are encouraged to be reflective and elaborative, to relax and to take their time. They are invited, not required, to share and discuss their work with others. This writer has found the "Draw to Learn" program helpful for students of many ages for developing awareness and expression of thought. However, there are very few references in the literature to the use of drawing for this kind of academic instruction. It appears that the use of drawing in formal education is predominately a privileged activity of early childhood education.

Despite the meagerness of the field, advocates for the use of drawing for academic instruction do exist. Several individuals developed teaching programs in the late 1980s which integrate drawing into academic instruction (Hubbard, 1989; Mason, 1989; Melton, 1985; Rose, 1989) and a few others have expressed interest more recently. One example is Joyce Armstrong Carroll, whose point of view is particularly congruent with this study. Carroll, writing in the
English Journal (1991), asks: "Why don’t we use drawing in middle and high schools as the powerful writing tool it is?" In the same article, she recommends encouraging students to draw, suggesting that:

We need to

1. Enable students to reenter texts in visual, non-threatening ways
2. Encourage drawing as a prewriting technique
3. Appropriate drawing as a springboard or further writing
4. Consider drawing an initial graphic probe, a strategy for tapping deeper or other awarenesses. (p. xxx)

Neu (1991) is also interested in the cognitive value of drawing and questions the disappearance of drawing in children’s writings as they mature. Is this "a natural development or a natural disaster?" Neu takes the latter position and suggests that "many students would benefit from continuing the drawing experience." She also suggests that older students, who often resist using drawing because they are distressed by their lack of skill, would welcome instruction. (This writer has found the Edwards approach of copying upside down pictures very successful in releasing "drawing block" [Edwards, 1979].)

Research on the benefits of the use of drawing combined with writing in academic domains is even more limited than applications of the same. There are only two studies known to this writer that focus on measuring some possible benefits in combining drawing with writing in the language arts (Sheridan, 1990; Skupa, 1985). Sheridan’s study indicated that writing and thinking are improved through a process which combines art lessons and explicit mediation related to writing.
Skupa found that a combination of drawing and idea generation enhanced writing. In each case, the subjects were elementary school children. So far, no study measuring a drawing/writing intervention at the secondary level has been found.

1.3 Purpose of the Study

The purpose of this study was to ascertain whether or not an intervention of the "Draw to Learn" program in a secondary language arts setting would enhance students' creativity and self-expression.

The "Draw to Learn" program consists of a series of drawing and writing activities developed by the researcher during the past four years (1989-1993). Although derived from the field of art therapy, the focus of the program is on learning. "Draw to Learn" is a double-processing technique which engages preferences of both cerebral hemispheres: drawing appeals to the right hemisphere, and writing to the left (Edwards, 1987). Since this double-processing of drawing and writing has been shown to be effective for younger learners, there is an expectation that it would be found to be beneficial for secondary learners as well.

The "Draw to Learn" program also engages participants in metacognition, or thinking about thinking, because all their responses are based on their own thoughts. These responses are expressed in drawings and writings which are kept in a "Draw to Learn" journal. Responses are also discussed in class, and students are invited to share and exhibit their work on a voluntary basis.

The "Draw to Learn" intervention used the following four suppositions as indicators of enhancement of creativity and self-expression:
1. Enhanced creativity will be demonstrated in some or all dimensions of the Torrance Test of Creative Thinking (non-verbal) by higher post- over pre-test scores.

2. Enhanced self-expression will be demonstrated by increased post-over pre-test scores in RESCORE (an instrument for measuring self-expression in writing [see Appendix A]) (Sheridan, 1990).

3. A randomly selected sample of student journals will be judged to show growth in creativity and self-expression over the period of the intervention. (An independent panel reviewed these journals, using standardized guidelines to evaluate creativity and self-expression.) [See Appendix B.]

4. Students will report increased creativity and self-expression through responses in a survey questionnaire. [See Appendix C.]

The domain of language arts was selected for this study on the impact of drawing on learning at the secondary level because of the existence of numerous claims about the beneficial influence of drawing on writing. Creativity and self-expression were selected for assessment because of the demand for competency in those traits and because there are instruments available for measuring them.

1.4 Definition of Terms

The terms that are important to the study described in this report are defined below. Because many of these terms can have different meanings in different situations, they are defined here to establish their usage in this study.

Creativity, according to Frank Baron (1969, in Davis [1986]), "may be defined quite simply as the ability to bring something new into existence." This definition is congruent with entries in the
Webster's Third New International Dictionary (1987) and the Oxford English Dictionary (1961/86). The root word "create," which means "to bring into being, to cause to exist, to produce," was adapted from the Latin by Chaucer in the 14th century. The word "creativity," meaning "the quality of being creative or the ability to create," did not enter the English language until the 1870s (OED).

While there is general agreement that all people possess creativity as an "ability to create," society's demand is for people who demonstrate the "quality of being creative." In other words, it is active creativity that is sought and valued. This active creativity generates products which have many incarnations.

Dictionary definitions of "create" include examples of product categories. Divine beings create something from nothing; humans create laws, roles, social positions, theories, ideas, things, events, etc. (OED). The results of creativity in action can, therefore, be concrete or abstract.

The active definition of creativity, i.e., "the quality of being creative," is used in this study. With active creativity, several components work together. Mel Rhodes (1961) described these components of active creativity as "person, press, process and product." The person (who is creative) responds to the press (external stimulus) with a process (action) that culminates in a product (idea, item, event).

These four "p's" are inherent in the drawing and writing program called "Draw to Learn," which was used in this study. The person was each student, with his or her own unique combination of creativity, self-expressiveness, knowledge and skills. The press was a complex
meld of student interest and motivation, classroom instruction and activities, homework assignments, school and classroom environments, the regular teacher and the "Draw to Learn" instructor, and the assessment strategies. The process was the "Draw to Learn" intervention in the classroom and the attendant data collection and analysis. The product consisted of the students' "Draw to Learn" journal entries and the results of the study.

**Self-expression.** In addition to increasing creativity, this study also intended to enhance self-expression through drawing and writing. Creativity is manifested through a person's self-expression. As an act, self-expression is a process, and it is one in which an individual conveys information about him- or herself to others. That information, in turn, is the product component of the procedure. Press, internal or external, gets self-expression started. Self-expression is an intrinsic feature of active creativity. Self-expression is the vehicle whereby creativity is externalized and communicated to others.

Self-expression is built into the Foundation section of SCANS mentioned before (see page 6). The Basic Skill of communication that is in the Foundation section will develop means of self-expression, which, in turn, will enable individuals to manifest their own traits and personality through the other Foundation skills of Personal Qualities and Thinking Skills. Self-expressive abilities are in demand in the workplace because employees need to be able to convey ideas, explain procedures, and describe goods and services as they meet continuous calls for new and/or improved processes and products.
The activities proposed by Resnick and Tucker's New Standards Project for content delivery and assessment also embody self-expression. Executing performance tasks, planning and carrying out projects and maintaining portfolios all require students to reveal their own personalities and traits through individual and divergent responses. This self-expressive approach to learning contrasts sharply with traditional educational strategies that concentrate on memorization and rote recitation of general, impersonal and convergent data.

The "explicit means" of self-expression in this study were the drawing and writing activities, the classroom comments and discussions and the student self-reports.

Drawing is "the art of creating an image by means of lines in order to represent objects seen in nature or to express ideas or emotions from the artist's imagination" (Encyclopedia Britannica, 7, 655). In "Draw to Learn," the expressing of ideas and emotions was the focus. To create drawings, individuals draw "an instrument across a surface" (Webster, 1979, p. 553). For this study, the instruments were colored felt-tip pens, and the surface was plain white paper. All participants, including the controls, received a set of felt-tip pens at the end of the experiment.

Left and Right Hemispheres, Lateral Dominance, and Double-Processing are terms relating to the cerebrum of the human brain. The cerebrum is divided into two major parts, called the right and left hemispheres, each of which has been found to have functional preferences, called lateral dominance. Double-processing describes
any activity which combines two diverse functions that engage preferences in each hemisphere.

Language Arts is the subject formerly called "English" in American schools. The "new English" is comprised of four dimensions of language education: reading, writing, speaking, and listening. This "new English" emphasizes developing skills in language arts through authentic activities performed across the curriculum. Although the language arts dimension of writing is the focus of this study, the other three dimensions come into play during the sharing stage of the "Draw to Learn" program.

Academic Instruction means instruction in language arts, mathematics, science, and social studies. Secondary level is seventh grade and above; elementary is kindergarten to sixth grade; primary is kindergarten to third grade; and pre-school is three years old to kindergarten age. The expression early childhood includes infancy and can go through kindergarten or primary, depending on the use of the term.

Enhance means to increase. The increase can be in quantity and/or quality. Both kinds are sought in this study.

Metacognition is a popular word in studies about thinking. It means "the act of consciously thinking about one's thinking." The practice of metacognition enhances thinking and many metacognitive strategies have been developed to help people use metacognition. Metacognition is intended to be generated in participants in the "Draw to Learn" program as they draw, as they interpret their drawing, as they write about their drawing and thinking, and as they explain their processes to classmates.
Journal. Participants in this study will keep their drawings and writings in a journal. Traditionally, a journal is a regularly kept, written record of personal events and thoughts. In recent years, "for purposeful self-development" has been added to the definition. The "Draw to Learn" program shares this expanded meaning and adds drawing to the customary writing format.

1.5 Following Chapters

The following chapters in this report provide a review of the literature on which this study is based, a description of the research methods that were selected for executing the study, a description of the results of the study, and conclusions and recommendations for future research.
2.1 Organization of the Chapter

Contained in this chapter is a review of the literature which provided the theoretical and methodological background for this study. The section devoted to theoretical material first explores the protean role of drawing in Western culture, including its relationship to writing and brain research. A discussion of creativity and self-expression follows and the section concludes with a description of the present status of language arts instruction.

The section devoted to methodological contributions begins with a description of the two tools selected for measuring the pre/post component of this study: the Torrance Test of Creative Thinking (T.T.C.T) and the Sheridan RESCORE. Then the usefulness of journals and self-evaluation surveys in educational research is discussed. The chapter concludes with an analysis of the relevance and importance of the literature to the study.

2.2 Theoretical Material

2.2.1 Drawing

Drawing is a time-honored human activity which pre-dates writing by many thousands of years (Encyclopedia Britannica, 23, p. 818). Its role throughout Western history has been a changing one. A brief survey of the history of drawing follows in order to support the claim that this study proposes a new use for drawing.
We know today that human beings have used drawing to express themselves for many centuries. However, when evidence of this ability in the form of paintings on rock walls was first discovered in 1879, its antiquity was not accepted. The paintings, which were on the ceiling of the now-famous Altamira cave in Santillana-del-Mar, Spain, were noticed by a little girl named Maria when she accompanied her father, Marcelino de Sautuola, in his investigations of bones and flints on the floor of the site. De Sautuola and his colleague, Vilanova y Piera (a geologist), were certain that the paintings were as old as the other things in the cave and argued for their antiquity at an international conference in Lisbon in 1880. However, the paintings were rejected as forgeries because many scholars could not believe that ancient people had such intelligence and artistic ability (Encyclopedia Britannica, 1, p. 684).

Subsequent discoveries of carved objects and additional cave paintings led to acceptance of the antiquity of both the artifacts and human intelligence at the turn of the century. Today, the paintings in the famous European caves are estimated to be between 10,000 and 30,000 years old (Encyclopedia Britannica, 1, p. 684).

Writing, on the other hand, is thought to be a much more recent invention and to have been derived from drawing (Rowland, 1965). As a sound-symbol process, writing is only about 5 or 6 thousand years old (Encyclopedia Britannica, 23, p. 819), yet it is accorded higher status than drawing. Drawings and other works produced before the development of writing are called "pre-historic," as if they are not part of the human story. A bias for writing persists to this day. For example, when school systems are pressed financially, the verbally
based programs survive, whereas the non-verbal ones (art, music, dance) are frequently reduced or eliminated.

It is difficult to define drawing precisely. For example, are the ancient rock-shelter works drawings or paintings? Is calligraphy writing or drawing? Is engraved drawing writing or sculpture? Clear distinctions among drawing, writing, painting, and sculpture are not readily achieved. In this study, drawing is considered to be an immediate process in which an individual moves "an instrument across a surface to make lines" (Websters Unabridged Dictionary, p. 553, def. 26) with the intention of representing "objects seen in nature or to express ideas or emotions from the artist's imagination" (Encyclopedia Britannica 7, p.655). Drawing has had many functions during its long history. These functions will be briefly described in the following paragraphs of this section of the literature review.

In Western civilization, drawing had a subservient role to painting and sculpture until the 20th century, when it achieved equal status as an art form. Before then, drawing existed primarily as a preliminary and preparatory activity in the creation of paintings and sculptures. For the ancients, the latter were the desired final products and the drawings on which they were based received scant consideration. Ancient drawings survive today only as sketches on shards of pottery, limestone chips, and scraps of papyrus. In the absence of concrete evidence, art historians infer that drawings were made in the process of creating Egyptian and Mesopotamian murals, Greek vases, and the painted panels that were popular in Hellenistic and Roman art forms (Rowland, 1965).
The preparatory function of drawing continued through a succession of media: wooden and wax tablets, parchment, and paper (in that sequence) are the main materials on which drawings of any permanence have been recorded. Implements changed accordingly. Starting with metal styli for use on wood and wax, the assortment grew and changed over the years, adding successively, chalks, charcoal, inks, paints, crayons, pastels, pencils, and felt-tip pens.

In Medieval Europe, preparatory drawings were preserved in the form of copy books made of collections of tablets or volumes of parchment. The drawings in these books were examples of approved designs for artists to copy and to hand down to future generations. Many were used for illustrations and illuminations in the manuscripted books of the time; others provided models for paintings and sculpture (Leymarie, 1979).

The copy books reflected the stylized, abstract, impersonal, and religious focus of medieval art. The contents and forms of the drawings followed set formulae and they were to be copied exactly from the copy books (Rowland, 1965). In the 13th century, the role of drawing began to change in the 13th century. Art became more secular and so did the content, use, and ownership of copy books. Gradually, artists became known as individuals, and drawings began to be done for personal reasons (Leymarie, 1979). The secularization and personalization of all the arts flourished throughout the Renaissance, and drawing came to be valued as an individualistic, private, and domestic form of self-expression. The arrival of paper manufacturing in Europe (Italy: 1276 and France: 1348) over 1,000 years after its
invention in China, made drawing easier and more affordable (Encyclopedia Britannica, 17, p. 280; Leymarie, 1979).

The arrival of paper also encouraged the development of the printing press which, in turn, changed the roles of both drawing and writing in human life. By 1500, or fewer than 50 years after Gutenberg's invention of the printing press, there were more than 1,700 presses in Europe (Encyclopedia Britannica, 18, p. 542). Books could now belong to many people, thereby making literacy more attainable. Then the secularizing and personalizing influences of the Renaissance, which enhanced the status of drawing, influenced writing and expanded the subject matter of books. Bibles ceased to dominate and the written word, like drawing, also became individualistic, private, and domestic.

The traditions of manuscript illumination were transferred to printing, and so continued the concept that a book consists of both words and pictures. Since many more books were being published than ever before, the craft of drawing was benefitted as printing flourished. Book illustrations had several functions: they embellished and framed writing; they provided visual interpretations of the text; and they provided precise information about the appearances and structures of objects and people.

The use of drawing as a preparatory stage for painting and sculpture continued to be essential and printing made copy books more available. Individuals also used drawing to make records of their possessions, and for personal satisfaction (Leymarie, 1979).

The demand for drawing to fulfill both a "didactic and decorative function" (Hutter, 1968, p. 77) continued to increase with
the spread of literacy and the growth of technology. Engineers needed mechanical drawings for tool and product designs, and architects for buildings. Medical books, fashion magazines, newspapers, and journals all needed pictures to make their meanings clear. Prints as well as paintings were in demand for domestic decoration and historical recording (e.g., the Currier and Ives prints of the 19th century).

The ability to draw had vocational merit, and was a serious school subject at the turn of the century, when more and more Americans were spending increasing amounts of time on education (Paul, 1985). Presumably the need for drawing would have continued to increase, along with advances in technology, greater school attendance, and larger population, had it not been for the development of photography and electronics. Photography limited the demand for artists by the excellence of its duplication of their work (Meder, 1978), and introduced a new art form, cinema, which was further enhanced by such electronic devices as video tapes and laser discs.

As the vocational role for drawing declined in the 20th century, its status as an art form improved. It stands today as an equal with painting and sculpture and, like them, tends to be abstract and conceptual because machines now provide realistic images. Drawing also continues to maintain the personal and idiosyncratic character it first attained during the Renaissance (Leymarie, 1979).

While the developing technologies in photography and electronics diminished the vocational role of drawing, other technologies made new roles for drawing possible. Improvements in the manufacture of paper and in the uses of fossil fuels for consumer goods led to the ready
availability of inexpensive paper, pens, crayons, and felt-tip markers. Thus, drawing became a generally affordable activity.

Two major roles for drawing emerged in this century from the young field of psychology. Both roles are democratic by nature and thus are dependent on the ready availability of materials described above. The first new role for drawing was for studying and augmenting the cognitive growth of children and the second was for improving mental health. In studies of learning in early childhood, diagnostic uses for drawing were devised to measure psycho-social growth (Betensky, 1973; Singer, 1973; van Sommers, 1984), and mental development (Goodenough, 1926; Torrance, 1979). Somewhat later, a prescriptive function evolved as people learned that drawing enhances children’s readiness for reading and writing (Buxton, 1982; Dyson, 1988; Hubbard, 1989; Neu & Berglund, 1991; Rodriguez, 1984; Vygotsky, 1978).

In the 1950s, art began to be used as a means for improving mental health. Drawing became, and continues to be, a dominant intervention in this new field of art therapy. Official status for art therapists was established in the 1970s with the development of several master's degree programs and the formation of the American Art Therapy Association (Wadeson, 1989). This latter organization established criteria for accreditation of therapists and programs. Art therapy has been found to be effective in a wide range of psychological and physical situations and the field today is experiencing worldwide growth (Gantt, 1973; Kubler-Ross, 1981; Siegel, 1986; Winnicott, 1965).
As a result of the spread of art therapy and its successful use in a variety of situations, many people in the field are suggesting that it should be a part of everyone’s lives (Dalley, 1984; Naumberg, 1973). In this opinion, they echo such illustrious predecessors as Sigmund Freud, Carl Jung, and John Dewey. All three of these pioneers in the life of the mind believed in the importance of self-expression through drawing and related non-verbal arts (Betensky, 1973; Kramer, 1979).

The work of Edwards (1987), Cappachione (1989), Hanks (1977), McKim (1972), McMurray (1988), and others is based on the art therapy view that drawing can benefit all people at all ages. More recently, specific classroom use of drawing for enhancing learning have begun to appear. Mason (1989) designed a multi-moded approach to teaching that includes drawing and has interdisciplinary applications. Rose (1989) created an elementary reading and writing curriculum which uses drawing activities in each lesson. Hubbard (1989) conducted an extensive study of children combining drawing and writing as they learned to read and write. Carroll (1991) and Neu and Berglund (1991) have reported positive experiences with the use of drawing in the language arts. In general, however, the field is sparse, and the only studies attempting to measure the impact of drawing on learning that this writer has found are Skupa’s (1985) work with drawing and idea generation and Sheridan’s (1990) “Drawing/Writing” program.

The concept that drawing can be helpful for everyone is supported by research on the brain. Roger W. Sperry, Nobel Laureate 1981, first demonstrated a division of labor within the cerebrum. Also called the neo-cortex, this largest part of the brain is divided
into two halves, or hemispheres, labelled "right" and "left," which are connected by a thin band of short, yellow nerve fibers called the "corpus callosum." Sperry demonstrated that each hemisphere has specific functional preferences and that the corpus callosum transmits information from one hemisphere to the other. According to the Sperry model, logical, literal, sequential, verbal, written work is the left hemisphere's preference, whereas the right hemisphere has a predilection for holistic, metaphoric, tandem, non-verbal, pattern-seeking thinking (Cherry, 1989).

This lateral dominance view of the brain led to the concept that drawing could involve parts of the brain that are not tapped by writing: drawing appealing to the right hemisphere and writing to the left.

Drawing and writing are both valuable for communication. Writing is a rapid, consistent, efficient, and explicit medium for recording sequential information. It has permitted the development of many systems for keeping records, preserves knowledge, improving communication and increasing opportunities for education. It is a dominant form of concrete expression in most societies, past and present. Being sequential in delivery, writing develops information over time and writers, therefore, control the sequence in which readers receive information.

Drawing can also be consistent, efficient, and explicit. But, it can be idiosyncratic and obscure as well, depending on cultural rules for its use. The use of drawing for simple communication is more easily mastered than writing, and therefore is useful to young children (Gardner, 1980). In addition, drawing is holistic, and all
the information is presented simultaneously. Consequently, sequence in perception with drawing is controlled by those receiving the information.

By joining drawing with writing, the cognitive repertoire available for any mental task is increased. The combination of word and image comes to us from the past in such examples as Egyptian mastaba paintings, Assyrian rock carvings, and Medieval manuscripts, and we find it today in cartoons, advertisements, children's books, and computer programs. Perhaps the persistence of this combination of word and image reveals an innate attraction to a double delivery system for recording, receiving, and processing information.

2.2.2 Creativity

From the very beginning of its short history as a subject of inquiry, creativity has been studied in disparate ways. The two men now credited with elevating creativity to the status of a bona fide discipline exemplify this disparateness. One, Alex Osborn, was in the advertising business, whereas the other, J. P. Guilford, was a scholar in psychological research.

Osborn's focus was on increasing the output of ideas from individuals and/or groups. His system of "Brainstorming" continues today as a simple, yet powerful and effective tool for creative thinking.

Guilford's interest was in the traits of individuals, and the "myriad abilities of the human mind" (Parnes, 1992, p. 69). He developed a three-dimensional, cubic model of these mental abilities which he called the "Structure of the Intellect (SOI)" (Biondi & Parnes, 1976). Several abilities described in the model have become
as much a part of the language of creative studies as Osborn's "brainstorming." Two, "convergent production" and "divergent production" are now basic concepts in teaching about and in practicing creative thinking. Many current programs that foster creativity include continuous analysis for the presence of convergent rules and divergent options in the situations under consideration.

Guilford equated divergent production with creativity, and introduced the terms "fluency, flexibility, and originality" to describe its qualities (Biondi & Parnes, 1976). Another major agent for creativity, E. Paul Torrance, built on Guilford's work, adding elaboration as a fourth quality of creativity. Torrance's Test of Creative Thinking (T.T.C.T.), which is used in this study, was first developed in the 1960s and continues to be a useful tool for studies in creativity.

Osborn's work also inspired others. Robert Eberle (1972) combined the verbs that Osborn used to increase idea production (such as "combine," "eliminate," and "magnify") into a readily used, and now very popular, acronym called SCAMPER. Over the years, many useful modifications of brainstorming have been developed such as written brainstorming, random object brainstorming, attribute listing, and morphological analysis (Biondi, 1974). More recently, the development of several software packages has made computerized brainstorming possible (Parnes, 1992).

While Guilford considered creativity to be embedded in divergent production, other thinking suggested a range in creativity that included convergent production. Two instances are the Osborn/Parnes Creative Problem Solving System (CPS) and the Kirton
Adaptation/Innovation Inventory (KAI). In the former case, CPS is divided into several steps, each of which consists of a divergent, idea-gathering stage and a convergent, decision-making stage. This system, which integrates Osborn's brainstorming with Guilford's convergent/divergent production, was first developed into a well-articulated and elaborated system by Sidney Parnes, Ruth Noller, and Angelo Biondi (Parnes & Harding, 1962). Others, including E. Paul Torrance, Donald Treffinger, John Feldhausen, and Scott Isaksen, have continued to create further refinements and useful applications for teaching many ages, groups, and grade levels.

The CPS model is usually diagrammed as a series of diamonds. Each stage in the problem solving is a diamond, with the outgoing sides representing divergent production and the ingoing sides representing convergency. In aggregate, the model, which usually consists of six stages, resembles an accordion. Recent work by Basadeur (1980) connects CPS to the Jungian thinking of Kolb (1976), Herrmann (1980), and McCarthy (1980) and, with them, employs a circular model.

Other well-known convergent/divergent applications are to be found in deBono's lateral and vertical thinking model (1967), in the Gordon/Prince Synectics' tactic of making the "familiar strange and the strange familiar" (Prince, 1968), and in the Kirton Adaptation/Innovation Inventory (1976) mentioned above.

The deBono and Synectic applications are for stimulating creativity and for using it in problem solving, whereas the Kirton Adaptation/Innovation Inventory (KAI) integrates convergent and divergent production in order to assess creativity in individuals.
Named for its inventor, Michael J. Kirton, the instrument is constructed on the premise that there is a range of creative behavior from highly adaptive to highly innovative. Adaptors tend to be more convergent in their creativity by working with what already exists. Innovators, on the other hand, are diversers who look for and value what is totally new, strange, and/or foreign to a particular situation. Adaptors are inclined to maintain a paradigm; innovators are comfortable creating new ones. Both kinds of creativity are important. Innovators think of new things and adaptors develop concrete applications.

The KAI is one of several instruments which have developed from interests in measuring creativity. Research in creativity has also been concerned with defining creativity and with identifying the conditions and factors which encourage it.

Definitions of creativity abound. Davis (1986) classifies the definitions using Mel Rhodes' (1961) "4 Ps" taxonomy of person, press, product, and process. The creative person was of interest from the very beginning, and studies have generated collections of traits possessed by creative people as well as operational and assessment strategies based on the concept that there are various ways of being creative. (The KAI represents this latter view.)

Guilford, as was mentioned earlier, devoted himself to research on personality, and came to equate creativity with divergent productivity. Torrance, building on Guilford's work, claimed that creative people exhibit various degrees of flexible, fluent, elaborative, and original thinking and are sensitive to possibilities for change in their environments (Biondi & Parnes, 1976). The test
for creative thinking which he developed (T.T.C.T.) is used to identify these abilities in individuals. Because of general acceptance of the concept that "creativity can be taught," the T.T.C.T. has also come to be used for research purposes, using a pre/post testing format.

Donald MacKinnon, who established the Institute for Personality Assessment and Research (IPAR) at the University of California at Berkeley (1949), and his colleague, Frank Barron, conducted studies to identify traits commonly possessed by creative people (Parnes & Harding, 1976). Barron also worked with Calvin Taylor, at the University of Utah, to present two conferences in Utah (1955 and 1956) devoted to identifying creative scientific talent. These conferences were the first two of ten "Utah Conferences" which eventually reported in many dimensions of research in creativity (Parnes, 1992).

Gary Davis, also on a quest to identify traits of creative people and working at the Research and Development Center of the University of Wisconsin, summarized research findings about personality traits in his book, Creativity is Forever (1986). His list is as follows:

Creative people often are (or have):

- aware of their creativity
- self-confident
- high in energy
- spontaneous
- wide interests
- playful, childlike
- aesthetic interests
- reflective
- attracted to novelty, complexity, and the mysterious. (p. 37)

While studying creative individuals and identifying traits associated with creative behavior, Torrance, MacKinnon, Barron,
Taylor, and Davis became aware that these traits are not distributed equally among individuals. Their findings are, therefore, consistent with the concept of creative style and personality which has emerged from applications of Carl Jung’s theory of personality.

Jung claimed that each personality contains two types of expressive potentials, extraversion and introversion, and four ways in which to function: through the senses, through intuition, through logical thinking, and through values and beliefs (Guild & Garge, 1991). The theory allows for a variety of configurations and has been formalized into several useful instruments, of which the Meyers-Briggs Personality Type Indicator (MBTI) is probably the best known and most widely accepted. The aforementioned Kolb, Herrmann, Basadeur, Kirton, and McCarthy also base their instruments on the Jungian dimensions of personality. Because the Jungian approach suggests that the expressions and functions that predominate are preferences rather than cast-in-stone traits, the theory allows for change. The same is true for the instruments: they are intended to indicate individual preferences (also called strengths) and they invite individuals to build on those preferences, practice the others, and honor people who have different "gifts" as sorely needed resources (Myers, 1980).

While Jung’s sensing and intuiting functions can be compared to convergent and divergent production and have been correlated with the KAI (Bokoros, 1990), most of the focus of the work with style has been on its identification in individuals and with its use for personal development and interpersonal interactions. Implicit in styles studies are the two main claims of current creativity theory:
everyone can be productive (or creative) and productivity (or creativity) can be enhanced by self-knowledge and practice.

Rhodes' "press" emerges as a concurrent concern for those engaged in personality research. Press translates as situation or environment for many, and is seen as a constant influence on creativity. MacKinnon reflects as follows:

The trait theory and the situational theory in their extreme forms are both inadequate in my judgment. Our task, if we are to predict behavior, is to specify both traits and situations; but more important still is the task of studying the interaction between the two classes of variables (Isaksen, 1987, p. 127).

Press introduces the influences of culture and other life circumstances on both creative behavior and creative products. Poverty and lack of education limit creative range; culture defines content (e.g., "women cook, men write books"); and so do environmental resources for information (e.g., libraries and people) and materials (e.g., wood, petroleum, etc.). The emotional environment also impacts on creativity. Osborn's first rule of brainstorming that "no evaluation of any kind is allowed in a thinking-up session" (Parnes, 1992, p. 24). reflects an appreciation of the importance of psychological safety that continues to be validated by both informal, anecdotal reporting and by systematic research. The Seventh Utah Conference was dedicated to "The Climate for Creativity" (Taylor, 1972) and, more recently, Amabile's research findings (1983) supported the notion that environment plays a powerful part in the actualization of creativity. Amabile's studies documented negative influences on creative product from three environmental factors: evaluation, peer observation, and rewards. As others had already suggested (e.g.,
Tumin, 1962, in Parnes, 1992, p. 105) the internal environment of the individual is a powerful "press" for creativity, but it is one that is easily inhibited by the external pressures of grades, prizes, and other forms of public recognition.

Product, in the form of novel behaviors, ideas, events, objects, etc., is generally expected from the exercise of creativity. Many definitions specifically include product. Davis (1986, p. 19) cites Barron and May, who refer to "something new," and Rhodes, who uses "new concept." Davis also includes other definitions that contain such terms as "composition," "innovation," and "new combination."

However, process definitions of creativity are by far the most abundant. Stein (1953) calls creativity "an inter- and intra-personal process" (Parnes & Harding, 1962). Torrance (1989) defines creativity as

the process of sensing problems or gaps in information, forming ideas or hypotheses, testing and modifying these hypotheses, and communicating the results (Parnes, 1992).

A literature survey by Welsch (1980, in Isaksen, 1987) to find agreements and disagreements in the meaning of creativity generated a process definition:

On the basis of the survey of the literature, the following definition is proposed: creativity is the process of generating unique products by transformation of existing products. These products, tangible and intangible, must be unique only to the creator, and must meet the criteria of purpose and value established by the creator (p. 9).

This definition, while emphasizing process, also includes products, person ("creator") and internal press ("purpose and value established by the creator"). External press, or situation, is missing, despite the fact that the Utah Conference (1972) on climate
for creativity predates the Welsch survey. One would expect today to
find external press included because of the Amabile research (1983).
Nevertheless, the Welsch synthesis invites appreciation of creativity
as a complex subject to be examined from many points of view, and to
be continually exhibiting new interpretations with ongoing research.
Current trends in thinking and learning theory support this
contention. For example, the field of critical thinking is undergoing
changes that involve creativity. Richard Paul, director of the
National Center for Excellence in Critical Thinking, maintains that
there is an "intimate connection" between critical and creative
thinking, and that both kinds of thinking are involved in reasoning
and problem solving. For "intellectual excellence" in reasoning and
problem solving, disciplined use of the "logic" of each kind of
thinking is required (Paul, 1992). By incorporating creative
thinking, Paul obviates the observations of Siegal, Carey (1989),
Perkins (1986), and Suhor (1992) that critical thinking is excessively
involved in retroactive analysis and does not, therefore, adequately
address nor validate good thinking in everyday life. Through creative
thinking, the "logics" of creative problem solving, creative style,
and idea stimulation can combine with appropriate critical thinking
"logics" such as examination of claims, detection of bias, and
evaluation of evidence, to produce flexible, proactive, self-
confident, practical thinking for everyone (Paul, 1992).

Learning theory is also impacting the field of creativity
through the increased acceptance of the concept of constructivism
combined with a greater number and availability of practical
applications for classroom teaching (Brooks & Brooks, 1993; Resnick &
Klopfer, 1989). The active approach to learning espoused by constructivism has had many proponents in recorded history. Some would credit Socrates as a first example; certainly John Dewey in the 1930s and Howard Gardner and Seymour Papert today belong in that category (Brooks & Brooks, 1993). One of the most influential constructivists was Jean Piaget: "In order for a child to understand something, he must construct it himself, he must reinvent" (Piers, 1972, p. 27).

Constructivism claims that knowledge cannot be deposited in brains by others, but instead must be created within each brain under the direction of the learner (Pekins, 1986; Resnick, 1989). Since this learning theory also maintains that all learners can be reached and improved, constructivism affirms the basic tenets of creativity: everyone has it, and everyone can improve it.

The field of creativity today is one of opportunity and potential expansion. It is hoped that its official status will improve and that there will be many more opportunities for research and for the practical use of what is already known.

2.2.3 Self-Expression

Self-expression is a protean and primarily 20th century term. In this study, self-expression is defined as: the act of representing one's own personal thoughts, ideas, feelings, intentions, etc., in words or symbols. This definition used in this study is based on a synthesis of two definitions: one from the 1987 edition of Webster's International Dictionary and the other from the Oxford English Dictionary of 1989.
Webster's version describes self-expression as: "the act of representing (or manifesting) one's own personality by explicit means of exhibiting one's individual traits."

The OED (1989) does not include a definition of "self-expression," but one of the many definitions of "expression" presented fits well with the Webster definition above, and with this study: "Expression: the action of representing a meaning, thought, state of things, in words or symbols; the utterance of feelings, intentions, etc."

The Webster version provides the personal flavor of the intervention: Students were invited to use expression on a personal level. The OED definition indicates the media used for this self-expression: "words and symbols," with drawing functioning as the latter term.

The closeness of the two definitions and the absence of an explicit definition of "self-expression" in the OED suggests that the terms are used inter-changeably. This seems to be the case, based on a literature search which included computerized files and numerous books by and about 20th century humanists and art therapists. Carl Rogers, for example, refers to "expressing one's own ideas and feelings" in one source (1977) and extols a learning process of "self-discovery and self-acceptance and self-expression" in another (1983).

In addition, the art therapist Shaun McNiff (1981) refers to "expression," "total expression," and "self-expression" in his introduction to The Arts and Psychotherapy, without either explaining the terms or making distinctions among them.
Calvin Taylor does likewise in his article, "Some Possible Relations between Communication Abilities and Creative Abilities" for the report on the 1st, 2nd, and 3rd Utah Conferences (Taylor, 1963). Both "expression" and "self-expression" are used. Neither term is discussed: no differentiations are offered.

In general, it appears that self-expression is the newer term, and that it may not have achieved universal acceptance. Title references in educational and psychological indices are sparse, and, as was mentioned previously, no definition appears in the 1989 OED. One reference to "self-expression" does appear in the OED amid a myriad of terms in which "self" functions as a prefix. This particular reference suggests that early uses of the term were pejorative. The reference is a quote from the April 7, 1982 issue of the Nation: "this doctrine of unbounded self-indulgence, or, as his (Walt Whitman's) admirers would prefer to call it, self-expression..."

While the "self-indulgent" meaning for self-expression is still operant, more frequent companions are such terms as "creativity," "self-actualization," and "self-development." "Self-expression," furthermore, has become a popular descriptor and appears in hundreds of abstracts of studies listed in the Silver Platter files for RIC and Psychological Abstracts for the past ten years. "Self-expression" also is included as a research title in both the PsychLIT (1992) and ERIC (1990) Thesauruses of index terms and descriptors.

Several inferences about the protean nature of "self-expression" can be drawn from the Silver Platter listings. First (and foremost) is the concept that self-expression is a good thing: it is highly
esteemed, very desirable, and greatly-to-be-sought-after. Many studies claim self-expression as a benefit.

Second, numerous studies imply that self-expression improves all kinds of academic performance, that it is a powerful agent in psychotherapy and that it enhances the quality of life by providing a sense of fulfillment.

Third, there are many claims that all sorts of activities promote and channel self-expression.

Finally, it seems that self-expression has political and cultural components: self-expression is part of the American right to freedom of speech and is perceived as an important factor for meeting each individual's need for and right to personal development. However, such is not the case worldwide. Studies reveal that societies and/or cultures value self-expression differently and that its attainment is not a universally desired goal in life.

In this study, self-expression is viewed positively and is considered, along with creativity, as worthy of being developed because the researcher believes that both improve academic performance, self-esteem, and comfort with life. The study draws on two sources for its understanding of self-expression: art therapy and language arts.

From art therapy comes the strong message that expression through drawing and other arts enables dysfunctional individuals to cure themselves and assists the functional in managing emotions, handling stress, and solving problems in their daily lives.

From language arts comes the concept that language is also an important tool for self-expression. The development of self-
expression through language was championed by James L. Kinneavy in 1971. In his book, *A Theory of Discourse*, Kinneavy proposed self-expression as the most basic of four essential forms of discourse. (The other three are referential [informational], literary, and persuasive.) He claimed that self-expression is "psychologically prior to all other uses of language." He also affirmed the American value of self-expression in his statement that "a democracy which ignores expression has forgotten its own roots" (Kinneavy, 1971, p. 394).

Kinneavy lists both individual and social forms of self-expression. Individual forms include conversation, journals, diaries, gripe sessions, and prayer. Social forms include protests, the Declaration of Independence, constitutions, myths, Utopias, and religious credos (p. 61).

Self is an important component of the art therapy and Kinneavy views of expression. The goal is not a final piece for marketing or display. Rather, the intention in self-expression is to enable individuals to find themselves and thus to empower them to strive for other goals. Achieving goals beyond self will continue to involve self-expression, but will add dimensions outside of self.

This study, with its use of journal format and its emphasis on personal response, is an example of individual self-expression as described by Kinneavy. In addition, the drawing strategies are congruent with art therapy strategies. Overall, "Draw to Learn" affirms the thrust of both fields' emphasis on self. The students were their own sources for their drawings and their writing. Through
them, they manifested their own personalities by "explicit means" and represented their thoughts and feelings in words and symbols.

2.2.4 Language Arts

Language arts, which is the modern name for "English class," encourages a global view of language. Numerous changes accompany the new title. First of all, the teaching of listening skills has been added to reading, writing, and speaking. Secondly, constructivist, interdisciplinary approaches to the teaching of language have been adopted and are being encouraged by the NCTE (Tchudi, 1991). These approaches include the Whole Language movement of the 1980s, which continues to impact language arts instruction. More and more, the workbooks and worksheets of the past are being abandoned in favor of "authentic" writing experiences, such as journals, letters, and interviews (Herrmann, et al., 1992; Lucas, 1993). Thirdly, integrated responses to language experiences are being promoted in which the efferent responses of "who, what, where, when, why, now" and "topic, thesis, main ideas" defer to aesthetic, affective responses. In other words, the language user is permitted to experience language first and analyze it second (Anderson & Rubano, 1991). Finally, language arts is an important component of the student portfolio projects that are currently being explored in many schools, as either alternatives or supplements to traditional testing (Tierney, et al., 1991). As was mentioned in the section on drawing, little attention has or is being given to the role of drawing in language arts instruction.
2.3 Methodological Material

2.3.1 Torrance Test for Creative Thinking

The Torrance Test for Creative Thinking (T.T.C.T.) is based on Guilford's divergent thinking view of creativity (Parnes, 1992). The test was first known as the Minnesota Test of Creative Thinking, and, as such, was first used in the 1950s. Revised in 1966 as the Torrance Test of Creative Thinking, it has become a popular tool (used in over 2,000 studies) for identifying creative behavior in such terms as fluency, flexibility, originality, and elaboration (Parnes, 1992). A review in 1972 (Boros), states that, despite some weaknesses, "studies do suggest that the test does measure behaviors consistent with the literature on creative behavior" (p. 448).

There is a verbal and a non-verbal (figural) T.T.C.T., each of which is available in forms A and B for use in pre/post testing. The non-verbal, figural form of the T.T.C.T. was used in this study. It was the main instrument for the comparative dimension of the study in which the pre- and post-test results of participants were measured against the pre- and post-test results of a control group.

The figural T.T.C.T. consists of three activities: picture construction, incomplete figures, and repeated figures (Frasier, 1988). According to Torrance (1974), these activities were designed to represent "three different aspects of creativity or three different creative tendencies."

In Picture Construction, students were asked to create a picture from an amorphous black shape about the size of a small apple. The Incomplete Figures activity presented a dozen or so line shapes which the students were asked to include in a larger form of their own
creating. The final activity, Repeated Figures, consisted of approximately two dozen identical shapes (a set of two parallel lines about an inch long in T.T.C.T. Form A, and circles the size of a quarter in Form B), which students were asked to transform in as many ways as they could devise in the allotted time of ten minutes. Ten minutes were also allotted for the first two activities. In all three cases, students were asked to create titles for all their products (Frasier, 1988, pp. 4-5).

Originality and elaboration are examined in the first activity, flexibility is added in the second, and fluency is the third. Thus, the final activity invites fluency, flexibility, elaboration, and originality of creativity thought and self-expression.

All the T.T.C.T. tests used in the intervention were corrected by Scholastic Testing Service, Inc., in Bensenville, Illinois. A streamlined, computerized method developed in 1984 was used which included measures of fluency, originality, elaboration, and substituted abstractness of titles and resistance to premature closure for flexibility. In addition, the following criterion-referenced measures were included:

- emotional expressiveness
- storytelling articulateness
- movement or action
- expressiveness of titles
- synthesis of incomplete figures
- synthesis of lines (A) or circles (B)
- unusual visualization
- extending or breaking boundaries
- humor
- richness of imagery
- colorfulness of imagery
- fantasy

(Frasier, 1988, p. 5)
A great deal of data was generated by this new (1984) Scholastic Testing Service scoring service, some of which was not germane to this study and is not, therefore, included in this report.

Torrance does not claim that the T.T.C.T. measures all aspects of creativity: "The T.T.C.T. was designed to measure what he (Torrance) has always called 'creative thinking abilities' or that constellation of generalized mental abilities commonly presumed to be brought into play in creative achievements" (Frasier, 1988, p. 5).

2.3.2 Sheridan RESCORE

The RESCORE instrument used in this study was developed by Susan Sheridan for her program called "Drawing/Writing" (Sheridan, 1990). The Sheridan application is similar to "Draw to Learn" in its combination of drawing and writing. However, it is quite different in practice. Sheridan's program calls for specific and directed instruction in drawing and writing about a concrete object in a variety of ways, whereas "Draw to Learn" invites participants to create non-objective drawings from their imaginations and then write about their thoughts and reactions. However, since both approaches seek to analyze writing behavior in relationship to drawing, use of the RESCORE instrument seemed to be appropriate for this study. The researcher consulted with Sheridan and developed, with her approval and editing, the form that was used in this study (see Appendix A).

RESCORE was selected to collect information about self-expression as it developed from the written component of "Draw to Learn." The original instrument was designed to measure both quantity and quality of writing by counting both the number of words produced and the number of adjectives, verbs, adverbs, nouns, similes,
metaphors, analogies, predictions, and hypotheses present in the samples being analyzed. The supposition in Sheridan’s study was that an increase in quantity in the above categories would indicate development of descriptive and inferential thinking skills among the subjects of the intervention.

The researcher sees a possible correspondence between the components of RESCORE and the T.T.C.T. factors of fluency, originality, elaboration, and resistance to closure. The amount of writing could equate with fluency and resistancy to closure, while the parts and figures of speech could reflect originality and elaboration.

While the two programs differ in focus, RESCORE is, nevertheless, applicable to both. RESCORE collects both quantitative and qualitative information directly from participants. The quantitative component of RESCORE was used in "Draw to Learn" for the pre/post analysis of participants’ self-expression in writing.

The first and the last writing samples produced by each participating student were analyzed at the end of the intervention by the students themselves. The classroom teacher and the researcher supervised the process. Responses to the qualitative component of RESCORE became part of the self-evaluation results (see Appendix D).

Since RESCORE is new and has not had much use, it was considered as a supplementary instrument in the quantitative dimension of the study.

2.3.3 Journals

Student products for "Draw to Learn" were collected into "Creative Journals." Students were informed that they were creating
Journals, and the role of journals in life and literature was mentioned as part of the intervention.

Journaling is a time-honored activity and many journals have come to be valued resources for knowing and understanding history. Journals can provide information about people and events, about living conditions and culture, and about the reflections, worries, and plans of particular individuals.

In recent years, journal writing has been encouraged for overall learning enhancement, especially for the development of reflective thinking and of self-expression in writing (Fulwiler, 1987; Kinneavy, 1971). Journals provide opportunities for students to connect writing with their own lives thus experiencing what the Whole Language movement of the 1980s calls "authentic" writing (Tchudi, 1991; Herrmann, 1992; Lucas, 1993). "Authentic" writing experiences are considered more effective for language arts instruction than the "false" writing of short-answer worksheets and fill-in-the-blank workbooks (Lucas, 1993). An abundance of ERIC references (3110) between 1982 and 1992 is evidence that journal writing today is an important language arts activity. Advocates of journaling also claim that the activity develops self-esteem and benefits general health and well-being. Outstanding among these advocates is Ira Progoff, who is widely recognized for his work in popularizing the use of journals for personal development, and who has developed an intense and elaborate journaling system for guiding individuals into heightened self-awareness and self-actualization (Progoff, 1975).

Journals are also associated with the new educational strategy of portfolio development. A portfolio is a collection of samples of
an individual student’s work which has been selected by the student, and which represents that student’s progress over time. In many instances, journals serve as important sources of selections for the portfolios (Tierney, et al., 1991).

Although journals are traditionally thought of as repositories of written thought, drawings frequently embellish the writing (e.g., Leonardo da Vinci and Beatrix Potter). During the past decade, the use of drawing in journals as a tool for improving thinking and self-expression has been promoted in both academic (Rico, 1983; Sheridan, 1992) and psychological domains (Capacchione, 1989; Edwards, 1987; McMurray, 1988) and has influenced the researcher to design this study.

In this study, students developed drawing/writing journals over a six-week period. At the end of that period, and after the administration of the T.T.C.T. post-test and the student self-reports (RESCORE and Opinion Survey), a panel of three judges evaluated 20 randomly selected journals for increase in creativity and self-expression. The overall process for evaluating the journals was adapted from the Consensual Assessment Technique developed by Amabile (1983) for the panel of judges she used in her study on extrinsic and intrinsic creativity. Criteria from that model (see Appendix E) functioned as operational standards for the judges.

2.3.4 Self-Evaluation Surveys

Self-evaluation surveys are commonly used to collect information in qualitative research. Although many standardized tests exist for studying self-concepts, attitudes, and interests, this study required a specially constructed opinion survey questionnaire to match the
unique content of the information. Several methods for obtaining consistent responses exist, such as the Thurstone "agree/disagree" format and the Likert scale of five choices ranging from "strongly agree" to "strongly disagree" (Borg & Gall, 1989).

A Likert scale response format was used in the self-evaluation survey that was designed for this study (see Appendix C). The self-evaluation study measured participants' attitudes about the "Draw to Learn" intervention. It consisted of 30 statements which:

1. examined feelings about the experience and beliefs about the value of the experience;
2. inquired about dispositions to continue to use drawing as a learning tool; and
3. explored self-concepts about personal creativity and self-expressive abilities.

2.4 Relevance of the Literature to the Study

The literature review in this chapter explored the various theoretical and methodological components of the "Draw to Learn" intervention. A survey of the role of drawing in Western European and American culture revealed that drawing, while always present, has played a minor role in the arts and has not been perceived as a tool for general learning. Although drawing today is accepted as an important component of early childhood education and as an effective strategy in psychotherapy, its potential for enhancing academic performance at the secondary level has not been studied. The literature supports the researcher's perception that drawing is not considered a useful learning activity for high school students.
The research initiated by Roger Sperry in the 1960s, which established a division of labor in the brain, is also relevant to the "Draw to Learn" program. Sperry discovered that many powerful cognitive functions are not readily accessed verbally and need other means for their expression. One of these possible means is drawing, which may play an important role in permitting direct expression of non-verbal thinking by using the "silent hemisphere's" strengths with shapes and colors, and by providing an outlet for its holistic and emotional thinking.

A survey of the field of creativity was important for this study since the intent of the research was to demonstrate an increase in creativity among the participants. The literature reviewed generated a complex description of the term, which included aspects of divergent and convergent production and the use of Mel Rhodes' person, process, press, and product (the Four "p's") components as an organizing principle. The four "p's" are embedded in the study. Participants (persons) developed products which were examined as indices of creativity while the process and the press were investigated through participant feedback in the self-evaluation questionnaire. Other dimensions of the study were also derived from the creativity readings. The work of Amabile on extrinsic and intrinsic motivation (press) provided material for the guidelines that were used by a panel to assess a sample of the participants' products. The Torrance test, which is based on aspects of divergent thinking, was the major tool for collecting quantitative data in this experiment. Since the figural version of the Torrance test was used, this instrument also connects with the drawing component of the study.
Readings on the current status of language arts show that many of the teaching and learning objectives in that domain are congruent with this study. Students need personally meaningful language (and other) experiences while they are engaged in learning about the world. For this to occur, the work that students do needs to be whole and authentic rather than piece-meal and synthetic. It should be initiated by students, rather than by their teachers, and it should provide opportunities for divergent responses. The "Draw to Learn" study satisfies the above conditions by calling for students to create products which are based on their concerns and which call for complete drawings and pieces of writing developed with a minimum of guidelines and shared at will with peers. The intervention was designed to provide a successful language experience by making participation in "Draw to Learn" the sole condition for a good grade and by minimizing external, negative press by eliminating comparison grading and competition.

"Draw to Learn" is a journal activity, and journals are among the recommended formats for the "new" language arts curricula. Thousands of articles in the past ten years testify to the use of journals in instruction and to interest in their role in teaching and learning. Journals have been so popular that problems with privacy and freedom of speech have arisen. Standards were recently established in a document called "Guidelines for Using Journals in School Settings," which was approved by the National Council of Teachers of English in 1986 (Fulwiler, 1987, p. 5). The purpose of the guidelines was to "help teachers avoid the problems of privacy
which journals occasionally present," and they should be useful for sustaining the utilization of journals in academic settings.

Other journaling strategies were found which applied the use of writing to personal development, and it was in this research rather than in the language arts that the use of drawing to enhance thinking and feeling appeared. This study transferred the drawing/writing combination from the field of personal development to academic instruction with the expectation that creativity and self-expression would increase.

Although a great deal of material about creativity was readily available in the literature, such was not the case for "self-expression," despite the current popularity of the term as a descriptor. There appears to be an assumption that the term is well understood, and that self-expression is an expected, valued, important, and necessary human function. After considerable research, the writer found a few explicit references to the value of self-expression in language arts (Kinneavy, 1971), and in personality development (Wolff, 1943, in Holajter, 1991). In these two references there was some discussion of the meaning and importance of self-expression.

The major part of the literature review focussed on the main topics in this study: drawing and creativity. Readings on language arts and journals were also discussed for their relationship to the main topics, and the instrumentation itself was found to have roots in them as well. Literature discussing self-expression, which is the companion to creativity in this study, was virtually non-existent, yet the term was found to be popular in current education and
psychological research. A similar condition exists for literature on
the use of drawing in secondary academic instruction and supports the
view that there is a need for study in this area.

The next chapter details the research methods that were used to
determine whether or not an intervention of the "Draw to Learn"
program in a secondary language arts setting enhances creativity and
self-expression.
CHAPTER 3

RESEARCH METHOD

3.1 Introduction

This chapter describes the methods that were used in the "Draw to Learn" study. It includes the research design information about the sample population, the timeline for the research, the schedule of the study, the instruments that were used for measuring creativity and self-expression, and a description of methods employed in collecting and analyzing data.

3.2 Research Design

The "Draw to Learn" intervention used the following four suppositions as indicators of enhancement of creativity and self-expression.

1. Enhanced creativity will be demonstrated in some or all dimensions of the Torrance Test of Creative Thinking (figural) by higher post-over pre-test scores.

2. Enhanced self-expression will be demonstrated by increased post-over pre-test scores in RESCORE (an instrument for measuring self-expression in writing [Sheridan, 1990]). [See Appendix A.]

3. A randomly selected sample of student journals will be judged to show growth in creativity and self-expression over the period of the intervention. (An independent panel will review these journals, using standardized guidelines to evaluate creativity and self-expression.) [See Appendix B.]
4. Students will report increased creativity and self-expression through responses in an opinion survey questionnaire. [See Appendix C.]

The domain of language arts was selected for this study on the impact of drawing on learning at the secondary level because of the existence of numerous claims about the beneficial influence of drawing on writing. Creativity and self-expression were selected for assessment because of the demand for competency in those traits and because there are instruments available for measuring them.

Research for the study to determine whether or not an intervention of the "Draw to Learn" program would enhance students' creativity and self-expression was conducted at Weaver High School in Hartford, Connecticut. The experiment took nine weeks and consisted of three phases: an informational and pre-testing period (two weeks), the intervention (five weeks), and a final stage for post-tests, self-report questionnaires, and journal analyses (two weeks).

The researcher administered the pre- and post-tests and the "Draw to Learn" intervention during regular English class periods. The regular teachers of those classes were present for those periods. They assisted in distributing and collecting tests and storing student products during the intervention, and they provided positive reinforcement for the researcher.

During the first phase of the experiment, the researcher informed students and teachers of the experiment, obtained permissions from participants, prepared the teachers for their role in the experiment, and administered the pre-test for the T.T.C.T. (See
Appendix F for samples of permission slips and correspondence related to obtaining permission to work at Weaver High School.

For the second phase, which was the administration of the intervention, the researcher visited the school six times in five weeks to present a "Draw to Learn" lesson. Each lesson consisted of a new activity and a discussion and sharing of previous activities. To prevent loss, all the student products were kept in the classroom in folders called "Creative Journals," which the students were permitted to decorate, if they wished. The purpose of the decoration of the journal was to re-enforce the message that the "Draw to Learn" strategies are part of a natural human inclination to doodle and decorate and that this form of self-expression is a valid language arts function which aids in the development of thought and language.

The final or third phase of the experiment consisted of two weeks (numbers 8 and 9) and was devoted to data collection. The post-test for T.T.C.T, the RESCORE, and the opinion survey were administered during week 8. Then 20 journals were selected at random for a panel evaluation which was conducted during the 9th and final week of the experiment.

3.3 Description of the Sample

The sample consisted of eight groups of students in English classes at Weaver High School in Hartford, Connecticut. Four intact classes were used for the intervention and the four other intact classes served as controls.

The school body, which numbers somewhere between 1,500 and 2,000 persons in grades nine through twelve, is predominately African American (mainland U.S.A. and the West Indies) with a sizeable Puerto
Rican minority. Many of the students' families receive some kind of public assistance.

3.4 Timeline and Schedule

3.4.1 Timeline

The total time for the complete intervention part of the study was to be nine weeks. The timeline was as follows:

Week one. Information to students and teachers and collection of permissions from participants' families. Review panel confirmed and provided with specific information about the study.

Week two. Administration of Torrance Test of Creative Thinking (T.T.C.T.), form A.

Weeks two and three. First "Draw to Learn" session.

Weeks three-seven. Remaining five sessions of "Draw to Learn."

Week eight. Administration of T.T.C.T., form B.

Week eight. RESCORE administered. Students receive and complete self-report questionnaire.

Week eight. Journals selected and delivered to the review panel.

Week nine. Journals analyzed and evaluated by the review panel.

3.4.2 Schedule

The overall schedule for the study was as follows:


March - June. Intervention, data collection, and panel review.

July - October. Data analysis.

3.5 Instrumentation and Data

Instrumentation consisted of the "Draw to Learn" intervention and four tools for measuring creativity and self-expression. Two tools, the Torrance Test of Creative Thinking (T.T.C.T.) and the Sheridan RESCORE, provided pre/post-test data on student performance. The Torrance Test was administered to both the experimental group and to a control group, and was the only instrument so used. The Sheridan RESCORE proved to be too challenging for most of the students, so data collection was limited to the first question on the pre/post section of the instrument and to responses to the opinion questions in the second and third sections.

The two other tools collected essentially descriptive information: an opinion survey questionnaire generated data about students' opinions of "Draw to Learn," while a panel of judges evaluated the effectiveness of the experiment in meeting its purpose of enhancing creativity and self-expression.

The "Draw to Learn" program consists of a series of lessons which combine drawing and writing. Each lesson began with an explanation and discussion time. This was followed by a drawing activity. Students were asked to notice their thoughts as they drew. The lesson ended with a writing time when they were asked to write about their thoughts and about their drawings. Prompts to initiate and stimulate writing were provided by the researcher (see Appendix G). Each lesson was to conclude with some sharing and discussion, but this part was minimal or absent due to severe time constraints. The researcher supplied plain paper and sets of colored felt-tip markers for the "Draw to Learn" activities and individual folders for holding
the product. All participants in the experiment (intervention and control, teachers and students) received a set of markers as a gift of thanks at the end of the project.

During the five-week period of the intervention, the students in the control group received their regular language arts instruction.

Four sets of data were generated by the instruments used in this study and were subjected to statistical analysis (see Chapter 4). The first instrument involved in the research was the Torrance Test of Creative Thinking (T.T.C.T.) and its purpose, in this instance, was to demonstrate enhanced creativity. Test results from the T.T.C.T., in the form of three sets of drawings, were analyzed by Scholastic Testing Service, Incorporated, to develop five indices of creativity in numerical form. These five indices are: fluency, originality, abstractness of titles, elaboration, and resistance to premature closure. These indices, in turn, were subjected to statistical analysis. Statistically significant increases in post- over pre-test results were expected in the experimental group, and none were expected in the control group.

The second instrument, the Sheridan RESCORE, was intended to demonstrate enhanced self-expression through writing (see Appendix A). The test is divided into three sections. In the first section, students compiled numerical indices of their first and last writings (e.g., number of words, adjectives, adverbs, similes, etc.). For a variety of reasons, which are discussed in Chapter 5, only one component in the first section, "number of words," could be analyzed statistically.
Sections two and three of RESCORE consisted of, respectively, opinion questions about the writing and drawing aspects of "Draw to Learn." The information from the answers to these questions was compared with results from the final instrument, the self-evaluation questionnaire (see Appendix C).

The opinion survey questionnaire gathered information about students' opinions of "Draw to Learn" (Appendix B). Responses were made on a Likert scale, which was analyzed statistically.

The fourth measurement focused on the students' journals. A panel of three experienced observers of creativity and self-expression examined, analyzed, and evaluated 20 randomly selected journals. The three judges used a Student Journal Analysis Sheet (SJAS, Appendix B) developed by the researcher to analyze the journals. They followed guidelines used by Amabile for the judges in her 1983 Study of Creativity (Appendix E). SJAS guidelines elicited both qualitative and quantitative responses. There were opportunities for comments which became part of the qualitative, anecdotal material produced by the experiment. In addition, there were Likert scale response formats for each section of the SJAS that were statistically analyzed and became part of the quantitative results of the "Draw to Learn" intervention.

The information generated by this experiment is of three sorts: data from analyses of student products (RESCORE and judges), opinions about "Draw to Learn" (RESCORE, questionnaire, and judges) and student performance results on a standardized test of creative thinking (T.T.C.T.).
This experiment produced a large amount of both quantitative and qualitative information. Not all of this information is directly related to the purposes of the "Draw to Learn" intervention. Data relevant to "Draw to Learn" are reported in the next part of the study, Chapter 4 - Results.
Presented in this chapter are data and analyses derived from the four measurement procedures used in the "Draw to Learn" intervention. These procedures were:

1. The Torrance Test for Creative Thinking (figural), form A (for pre-testing), and form B (for post-testing).
3. The Sheridan RESCORE instrument.
4. Evaluations by a panel of three judges of twenty randomly selected Student Journals.

All four procedures generated a large amount of information that could be, and was, subjected to statistical analysis. Not all of the results of the intervention are relevant to this study and are not, therefore, included in this report. The Torrance Test of Creative Thinking, for example, provided detailed information about individual participant responses to each of the dimensions of the instrument as described in Chapter 3 that was interesting and potentially useful for other analyses, but it was not needed in this study which examines overall group and individual performance. For the same reason, data about individual responses that were created when the panel of judges studied selected student journals are not included herein. Furthermore, computer analyses of the Opinion Surveys and the RESCORE
created correlational information about the response patterns that was not relevant to this report and has not, therefore, been included.

In addition to numerical data from the four procedures, considerable anecdotal material was produced during the intervention, relevant parts of which are also included in this chapter. The chapter itself is divided into separate sections to accommodate the five sets of results.

4.1 The Torrance Test of Creative Thinking (figural)

The Torrance Test of Creative Thinking (T.T.C.T.) was used as an indicator of creativity for participants in the "Draw to Learn" intervention. Higher post-test over pre-test scores were expected for participants as compared to a control group.

Two forms of the test, Figural A and Figural B, were administered. Ninety-four subjects, equally divided (47 each) into control and experimental groups, received form A as a pre-test. Form B served as the post test in which the control group remained the same in size (47), while the experimental group decreased by seven subjects (40). The Form A pre-test, Form B post-test sequence was recommended by the Scholastic Testing Service (STS), which furnished both the tests and a scoring service for processing the responses.

Each individual performance was analyzed by STS according to the five dimensions of the figural T.T.C.T.: fluency, originality, titles, elaboration, and resistance to closure. In addition, three other scores were calculated:
1. Overall averages for the five dimensions.

2. A creativity index which combined the overall average for the five dimensions with notable performance in any of the following thirteen behaviors:

* emotional expressiveness
* storytelling articulateness
* movement or action
* expressiveness of titles
* synthesis of incomplete figures
* synthesis of lines (A) or circles (B)
* unusual visualization
* internal visualization
* extending or breaking boundaries
* humor
* richness of imagery
* colorfulness of imagery
* fantasy

3. A national percentile score.

Individual scores in all of the above were then combined to determine group scores for the pre- and post-test control and experimental populations. In all cases, means, standard deviations, and standard errors were derived and results were subjected to a two-tailed separate variance analysis. No statistically significant differences between control and experimental groups were found in the T.T.C.T. (figural A) pre-test results (p>.05 in all cases: see Table 4.1). However, post-test results from T.T.C.T. (figural B) revealed statistically significant differences between control and experimental
groups in all measures (p>.05) except "titles" and "elaboration" (see Table 4.1). There was no significant difference between the two groups in those dimensions.

Table 4.1

P Values of T.T.C.T. Pre- and Post-Test Results

<table>
<thead>
<tr>
<th>Test</th>
<th>A (pre-test)</th>
<th>B (post-test)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluency</td>
<td>.933</td>
<td>.022</td>
</tr>
<tr>
<td>Originality</td>
<td>.987</td>
<td>.000</td>
</tr>
<tr>
<td>Titles</td>
<td>.529</td>
<td>.139*</td>
</tr>
<tr>
<td>Elaboration</td>
<td>.533</td>
<td>.168*</td>
</tr>
<tr>
<td>Resistance</td>
<td>.915</td>
<td>.044</td>
</tr>
<tr>
<td>Average</td>
<td>.689</td>
<td>.002</td>
</tr>
<tr>
<td>C. Index</td>
<td>.632</td>
<td>.003</td>
</tr>
<tr>
<td>National</td>
<td>.615</td>
<td>.003</td>
</tr>
</tbody>
</table>

H₀ retained at p = >.05

H₀ rejected at p = <.05 except for *

Control and experimental groups were similar in performance on the pre-test and noticeably different on the post-test, with the control group scoring higher than the experimental group on the post-test (see summary of means, Table 4.2). These results are the opposite of what was expected. It was supposed that the experimental group would score higher than the control group on the post-test.

While the researcher observed restlessness and impatience among all subjects during both pre- and post-testing sessions, many participants in the intervention group were openly resistant to the post-test. They voiced such complaints as "why do we have to do this?", "where are our markers?", "can't we keep doing our drawings?" Many talked during the test, some made fun of or complained about the activities, others grumbled about being bored, several made partial
Table 4.2

Means of T.T.C.T. (figural)
Form A (pre-test) and Form B (post-test)
Results

<table>
<thead>
<tr>
<th>Group</th>
<th>Form A 1 Experimental</th>
<th>Form A 2 Control</th>
<th>Form B 1 Experimental</th>
<th>Form B 2 Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluency</td>
<td>106.19</td>
<td>105.85</td>
<td>98.57</td>
<td>108.8</td>
</tr>
<tr>
<td>Originality</td>
<td>100.51</td>
<td>100.57</td>
<td>80.00</td>
<td>97.6</td>
</tr>
<tr>
<td>Titles</td>
<td>82.9</td>
<td>87.7</td>
<td>78.00</td>
<td>88.57</td>
</tr>
<tr>
<td>Elaboration</td>
<td>81.7</td>
<td>84.0</td>
<td>77.8</td>
<td>82.85</td>
</tr>
<tr>
<td>Resistance to Closure</td>
<td>107.3</td>
<td>107.8</td>
<td>95.4</td>
<td>104.8</td>
</tr>
<tr>
<td>Average</td>
<td>95.7</td>
<td>97.1</td>
<td>86.45</td>
<td>96.38</td>
</tr>
<tr>
<td>Creativity Index</td>
<td>104.2</td>
<td>106.1</td>
<td>94.95</td>
<td>106.12</td>
</tr>
<tr>
<td>National Percentile</td>
<td>43.7</td>
<td>46.8</td>
<td>28.45</td>
<td>46.46</td>
</tr>
</tbody>
</table>

efforts with each component of the test and a few quit part-way through. This degree of resistance was not encountered in the control groups and is consistent with the results from the statistical analysis of the T.T.C.T.

Although the overall focus for the T.T.C.T. was on average group behavior, some investigation into individual performance was also carried out. Its purpose was to see if the pre-/post-test score comparisons of participants in both the control and experimental groups were consistent with the separate variance analyses of the experimental and control groups described above.
Each group was examined to determine the populations of participants who took both the pre- and post-tests. The populations in the experimental group were slightly different: 46 subjects took the pre-test and five of them were absent for the post-test. An additional student who had been absent for the pre-test took the post-test for a total of 42 and an overall roster of 47 subjects. The control group, on the other hand, consisted of the same 47 subjects throughout. Therefore, within the two sets of results are 40 control group subjects and 47 experimental subjects with pre- and post-test scores. The Creativity Index scores for the subjects in the two groups (pre- and post-test) were tallied and their distribution is represented in stem/leaf format in Table 4.3. From this graph, it can be seen that some scores for both groups declined in the post-tests, but that the overall drop was greater for the experimental group.

The differences between pre- and post-test scores of individual participants were determined and they are graphed in Table 4.4. While more than 50% of the individuals in each group scored lower on the post-test, a larger proportion of the experimentals lost points than did the controls (67.5% compared to 55.5%). Furthermore, individual experimentals tended to lose more points per person than their control group counterparts (85% dropping 10 or more points versus 50% of the same, respectively). Similarly, on the increased score side, a larger proportion of the control group (32.5% to 44.7%) gained points. Sixty-seven percent of the individuals gained 10 or more points, as compared to 54% of the subjects in the experimental group.
Table 4.3
Creativity Index Scores

<table>
<thead>
<tr>
<th></th>
<th>Pre-Test</th>
<th></th>
<th>Post-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXPERIMENT (n=40)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14:</td>
<td>1</td>
<td>14:</td>
<td></td>
</tr>
<tr>
<td>13:</td>
<td>0</td>
<td>13:</td>
<td>0</td>
</tr>
<tr>
<td>12:</td>
<td>2, 1, 6, 8, 1, 1</td>
<td>12:</td>
<td>9, 5, 0</td>
</tr>
<tr>
<td>11:</td>
<td>6, 2, 3, 4, 4, 0, 4, 8, 4</td>
<td>11:</td>
<td>3, 4, 1, 3, 4, 4</td>
</tr>
<tr>
<td>10:</td>
<td>8, 4, 2, 8, 0, 6, 1, 0, 9, 1</td>
<td>10:</td>
<td>5, 3, 8, 6, 5</td>
</tr>
<tr>
<td>09:</td>
<td>1, 0, 9, 7, 9, 9, 7</td>
<td>09:</td>
<td>3, 6, 4, 1, 7, 3, 3, 4</td>
</tr>
<tr>
<td>08:</td>
<td>5</td>
<td>08:</td>
<td>1, 1, 4, 9, 6, 5, 5, 9, 6</td>
</tr>
<tr>
<td>07:</td>
<td>9, 9</td>
<td>07:</td>
<td>7, 9, 5, 8, 1, 8</td>
</tr>
<tr>
<td>06:</td>
<td>0, 6</td>
<td>06:</td>
<td>3</td>
</tr>
<tr>
<td>05:</td>
<td>mean = 103.9</td>
<td>05:</td>
<td>mean = 94.95</td>
</tr>
<tr>
<td>04:</td>
<td>2</td>
<td>04:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Pre-Test</th>
<th></th>
<th>Post-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTROL (n=47)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14:</td>
<td>2</td>
<td>14:</td>
<td></td>
</tr>
<tr>
<td>13:</td>
<td>3, 0</td>
<td>13:</td>
<td>9, 3, 0</td>
</tr>
<tr>
<td>12:</td>
<td>2, 2, 5, 6, 6, 9, 3, 3, 0</td>
<td>12:</td>
<td>7, 4, 3, 2, 3, 0</td>
</tr>
<tr>
<td>11:</td>
<td>0, 9, 9, 4, 0, 0, 2, 0, 8</td>
<td>11:</td>
<td>1, 7, 1, 6, 9, 7, 7, 5, 3, 1, 2, 7, 2, 5</td>
</tr>
<tr>
<td>10:</td>
<td>9, 4, 4, 5, 1, 8, 0</td>
<td>10:</td>
<td>5, 0, 4, 0, 5, 7, 1, 0, 7, 3</td>
</tr>
<tr>
<td>09:</td>
<td>3, 4, 1, 1, 9, 5, 9, 6, 5</td>
<td>09:</td>
<td>3, 9, 9, 3, 5, 7, 3</td>
</tr>
<tr>
<td>08:</td>
<td>3, 9, 1, 3, 9</td>
<td>08:</td>
<td>2, 8, 8</td>
</tr>
<tr>
<td>07:</td>
<td>2</td>
<td>07:</td>
<td>3, 8, 1</td>
</tr>
<tr>
<td>06:</td>
<td></td>
<td>06:</td>
<td>6</td>
</tr>
<tr>
<td>05:</td>
<td>2, 4</td>
<td>05:</td>
<td>mean = 105.98</td>
</tr>
<tr>
<td>04:</td>
<td></td>
<td>04:</td>
<td></td>
</tr>
</tbody>
</table>

Results from this analysis of individual performances on the T.T.C.T. are consistent with results from the overall group variance analysis reported in the first part of this section of Chapter 4, and both sets of data indicate that the performance of the control group on the T.T.C.T. was superior to that of the experimental group.
Table 4.4

Individual Score Changes, Pre/Post T.T.C.T.

<table>
<thead>
<tr>
<th>EXPERIMENT (n = 40)</th>
<th>CONTROL (n = 47)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-) 0, 8, 8, 8 : 0 :</td>
<td>(-) 3, 9, 0, 2,</td>
</tr>
<tr>
<td>3, 2, 6, 9, 8, 9, 1,</td>
<td>3, 0, 7, 6, 4,</td>
</tr>
<tr>
<td>4, 1 : 7, 6, 1, 3</td>
<td>5, 8, 9, 9, 1 :</td>
</tr>
<tr>
<td>7, 5, 2, 1, 0, 1, 7 :</td>
<td>1 : 1, 2, 0, 4,</td>
</tr>
<tr>
<td>2 : 5, 7</td>
<td>3, 2, 2, 2</td>
</tr>
<tr>
<td>1, 7, 2, 7, 6, 0 :</td>
<td>6, 5 : 2 : 8, 4</td>
</tr>
<tr>
<td>3 : 5, 6, 4</td>
<td>n = 26 (55.3%)</td>
</tr>
<tr>
<td>n = 27 (67.5%)</td>
<td>mean = 12.84</td>
</tr>
<tr>
<td>mean = 20</td>
<td>mean = 2 : 4 :</td>
</tr>
<tr>
<td>n = 13 (32.5%)</td>
<td>n = 21 (44.7%)</td>
</tr>
<tr>
<td>mean = 14</td>
<td>mean = 15.4</td>
</tr>
</tbody>
</table>

4.2 Opinion Survey for the Creative Journal Activity

The "Opinion Survey for the Creative Journal Activity" (see Appendix C) consists of thirty questions which probe for student opinions and perceptions about the intervention. It was, therefore, only administered to the experimental group. Thirty-one of the 47 subjects completed the questionnaire. The other 16 were absent due to end-of-year distractions. Since no additional dates were available on the school calendar for the intervention, the researcher could not collect the missing data.

There are five general categories:

1. Reactions to the drawing part of the experiment.
2. Attitudes about the relationship between drawing and writing parts of the intervention.
3. Opinions of the "Draw to Learn" intervention (with a positive attitude invited in the survey).

4. Perceptions of the cognitive dimensions of "Draw to Learn."

5. Images of self as writer, drawer, and creative person.

A Likert Scale was used for responding using the scale Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), and Strongly Agree (SA), respectively. Data collected were analyzed question by question for response frequency (individuals) and for proportions of total responses (as percents). The results for response frequency were then converted into bar graphs with all five dimensions of the response options (SD, D, N, A, SA) represented (see Appendix H). The percentage proportions for the same five dimensions were also tabulated (see Appendix I).

Four of the five general categories of questions included subsets, as follows:

1. "Reactions to the drawing experience" was divided into:
   a. pleasure/interest in doing the drawing (questions 1, 4, 12)
   b. having a sense of completion about each drawing (questions 5, 6, 10)
   c. negative self-talk (questions 3, 8, 11)
   d. engagement (questions 13 & 14)

2. "Attitudes about the drawing/writing relationship"
   a. drawing stimulates writing (questions 18 & 21)
   b. drawing might stimulate writing (questions 9 & 15)
3. "Opinions of the 'Draw to Learn' intervention"
   a. positive attitude invited (questions 7, 20, 25, 27)
   b. plans for future use (questions 26 & 30)

4. "Perceptions of the cognitive dimensions of 'Draw to Learn'"
   a. usefulness in thinking (questions 2, 19, 28, 29)
   b. value for real life problem solving (questions 23 & 16)

Percentage averages were made for each of the subsets. They are reported below with accompanying observations.

1.a Pleasure/interest

<table>
<thead>
<tr>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.5%</td>
<td>8.6%</td>
<td>16.13%</td>
<td>43.0%</td>
<td>29.13%</td>
</tr>
</tbody>
</table>

It appears that most of the group liked the drawing activities

1.b Sense of completion

<table>
<thead>
<tr>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.3%</td>
<td>33.76%</td>
<td>28.26%</td>
<td>18.8%</td>
<td>4.3%</td>
</tr>
</tbody>
</table>

These results are consistent with the researcher's other experiences with "Draw to Learn." She has found that many people prefer to do a new drawing each time they start a new entry in their Creative Journals.

1.c Negative self-talk

<table>
<thead>
<tr>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.53%</td>
<td>25.8%</td>
<td>29.03%</td>
<td>24.7%</td>
<td>12.9%</td>
</tr>
</tbody>
</table>

Although many subjects are engaged in negative self-talk about their drawing, a substantial proportion of the sample did not.

1.d Engagement

<table>
<thead>
<tr>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.65%</td>
<td>29.05%</td>
<td>32.25%</td>
<td>29.05%</td>
<td></td>
</tr>
</tbody>
</table>
While no one would admit fervently to experiencing strong involvement with the drawing activity, a substantial percentage either agreed or was undecided.

2. a Drawing stimulates writing

<table>
<thead>
<tr>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.38%</td>
<td>41.9%</td>
<td>32.3%</td>
<td>6.45%</td>
<td></td>
</tr>
</tbody>
</table>

Most of the sample did not consciously claim that the drawing stimulated their writing.

2. b Drawing might stimulate writing

<table>
<thead>
<tr>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.4%</td>
<td>20.95%</td>
<td>37.1%</td>
<td>17.75%</td>
<td>4.85%</td>
</tr>
</tbody>
</table>

More of the sample was open to the possibility that drawing might stimulate writing.

3. a Positive attitude invited

<table>
<thead>
<tr>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.9%</td>
<td>17.75%</td>
<td>29.05%</td>
<td>33.05%</td>
<td>7.25%</td>
</tr>
</tbody>
</table>

The group as a whole seemed to be more positive than negative about "Draw to Learn."

3. b Plans for future use

<table>
<thead>
<tr>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.7%</td>
<td>24.65%</td>
<td>42.45%</td>
<td>9.85%</td>
<td>3.35%</td>
</tr>
</tbody>
</table>

While the group generally liked the intervention and had positive attitudes about it, most of the participants did not see themselves using "Draw to Learn" in the future. Quite a large proportion, however, were undecided.

4. a Usefulness in thinking

<table>
<thead>
<tr>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.93%</td>
<td>15.53%</td>
<td>26.02%</td>
<td>36.55%</td>
<td>12.15%</td>
</tr>
</tbody>
</table>
Close to half the sample perceived noticed stimulation of thinking. The question "I find I get ideas when I am drawing" in this subset had 67.7% agree overall, and 61.3% went to "drawing helps me think."

Responses to the other 2 items were more evenly distributed.

4.b Value for real-life problem solving

<table>
<thead>
<tr>
<th></th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>18.1%</td>
<td>41%</td>
<td>27.8%</td>
<td>11.45%</td>
<td>1.6%</td>
</tr>
</tbody>
</table>

Participants, as a whole, did not make connections between "Draw to Learn" and real-life problem solving.

The fifth category, "Images of self as writer, drawer, and creative person" already named its subsets within the title. Each subset was represented by one question. The proportional percentages of responses are:

5. Images of Self

a. as writer

<table>
<thead>
<tr>
<th></th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>9.7%</td>
<td>16.1%</td>
<td>12.9%</td>
<td>51.6%</td>
<td>9.7%</td>
</tr>
</tbody>
</table>

b. as drawer

<table>
<thead>
<tr>
<th></th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>35.5%</td>
<td>12.9%</td>
<td>22.6%</td>
<td>22.6%</td>
<td>6.5%</td>
</tr>
</tbody>
</table>

c. as creative

<table>
<thead>
<tr>
<th></th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>10%</td>
<td>10%</td>
<td>16.7%</td>
<td>36.7%</td>
<td>26.7%</td>
</tr>
</tbody>
</table>

Many of the subjects consider themselves capable of expressing their ideas in writing, and a similar proportion consider themselves creative. At the same time, a sizeable number did not feel they are people who can draw.

While many questions were clearly favored by a majority, no question totally captured the group. Question #18 ("when I draw I get
the urge to write") came closest to a mandate with no "agree" or "strongly agree" responses, but even it had a healthy population marking the "neutral/undecided" position. Although there was one question with no "strongly disagree" (#6) and four other questions that lacked "strongly agree" responses (#s13, 14, 21, & 25), only question #18 had a totally asymmetrical response distribution. Furthermore, even though "neutral/undecided" was the most frequently chosen response, it dominated only one question, #26 ("I plan to continue with my creative journal") with 51.6% of the response. (See Appendix H for the bar graphs of these data.)

Thirty-one subjects made 925 responses out of a possible 930 on the 30-item questionnaire (see Appendix J for a compilation of responses). Neutral/undecided was the most frequent response, followed in order by "agree," "disagree," "strongly disagree" and "strongly agree" (see Figure 4.1). Overall, the group tended to avoid the latter, extreme opinions.

<table>
<thead>
<tr>
<th></th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td># Responses</td>
<td>122</td>
<td>208</td>
<td>259</td>
<td>246</td>
<td>90</td>
</tr>
<tr>
<td>Mean</td>
<td>4.06</td>
<td>6.93</td>
<td>8.63</td>
<td>8.2</td>
<td>3</td>
</tr>
<tr>
<td>% of Total</td>
<td>13%</td>
<td>22%</td>
<td>28%</td>
<td>26.6%</td>
<td>9.7%</td>
</tr>
</tbody>
</table>

Figure 4.1. Responses to 30-Item Questionnaire

As was mentioned earlier in this section, overall frequency of answers to each question (in percentages) was also determined (see Appendix I). Then the "strongly disagree" and "disagree" percentages were combined, as were the "strongly agree" and "agree" ones and they were graphed along with "neutral/undecided" in stem/leaf format (see Table 4.5).
<table>
<thead>
<tr>
<th>DISAGREE</th>
<th>NEUTRAL</th>
<th>AGREE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0: 97</td>
<td>94 67</td>
<td>87 67</td>
</tr>
<tr>
<td>1: 61</td>
<td>90 90</td>
<td>93 67</td>
</tr>
<tr>
<td>2: 90</td>
<td>90 90</td>
<td>91 59</td>
</tr>
<tr>
<td>3: 87</td>
<td>87 55</td>
<td>87 55</td>
</tr>
<tr>
<td>4: 84</td>
<td>55 55</td>
<td>87 19</td>
</tr>
<tr>
<td>5: 48</td>
<td>33 33</td>
<td>49</td>
</tr>
<tr>
<td>6: 77</td>
<td>26 26</td>
<td>77</td>
</tr>
<tr>
<td>7:</td>
<td>00 00</td>
<td>42</td>
</tr>
</tbody>
</table>

Each category of response had a different pattern. A bell-shaped curve emerged for the "neutral" responses with almost two-thirds of the questions attracting between 23 and 35% of the subjects. In the "agree" category, the situation was quite different. The distribution ranged from zero to 74% and was quite evenly distributed. The "agree" category had the greatest number of questions attracting 50% or more of the subjects.
The "disagree" category also had questions that attracted 50% or more of the sample, although overall distribution was in a bell-shaped curve. Both "agree" and "disagree" had a greater distribution of responses than "neutral." "Disagree" ranged between 9.7% and 67.7%; "agree" ranged between zero and 74.2%; whereas "neutral" went from 12.9% to 51.6%, with only one question attracting the latter response. For no question was there a very low or high proportion of "neutral" responses and only one question attracted more than 50% of the sample.

Eight questions were dominated by "agree" in attracting more than 50% of the responses. Another seven questions were dominated by the "disagree" category. These strong response questions are:

"Agree/Strongly Agree

# 1. "Drawing is an enjoyable activity." (74.2%)
#12. "I am really pleased with some of my drawings." (71%)
# 2. "I find I get ideas while I am drawing." (67.7%)
#22. "I am creative." (63.4%)  
# 4. "My pictures often surprise me." (61.3%)
#24. "I can express my ideas in writing." (61.3%)
#29. "Drawing helps me to think." (61.3%)
# 6. "I can tell when I am finished." (54.9%)

Disagree/Strongly Disagree

#18. "When I draw I get the urge to write." (67.7%)
#23. "The creative journal helps me solve some of my problems." (66.7%)  
#10. "I like to go back the next time and continue on the same drawing." (54.8%)
#21. "The project helped me with writing." (54.8%)
#16. "The creative journal helps me think about my life." (51.6%)
# 5. "I am never satisfied with my work." (50%)
#30. "I will use 'Draw to Learn' in other classes." (50%)

Showing work to others and feeling one should be more useful are worthy of note at 48+%, as are disagreeing with the idea that drawing
helps writing (45.2%) and not feeling one is a person who can draw (48.4%).

Overall, the Opinion Survey for the Creative Journal Activity indicates a range of opinions about the five categories of questions. There are trends in the distribution of the responses that relate to the function and value of the drawing and writing components of the intervention. These trends appear to be consistent with other results and observations and will be discussed more extensively in Chapter 5.

4.3 RESCORE

The RESCORE instrument used in this study was developed by Susan Sheridan for her program called "Drawing/Writing" (Sheridan, 1990). See Appendix A for the Instrument and Chapter 2, page 47, for a description.

In this study, RESCORE was used as a means of analyzing the structure and composition of the first and last writing samples and to provide participants with an opportunity to reflect on their writing and their drawing. The supposition was that there would be more writing in the last sample and that this would be accompanied by increases in several parts and figures of speech. These increases would be taken as evidence of an increase in written self-expression.

There are two parts to the RESCORE adaptation used in this study. Part One is analytical and examines the first and last writing samples produced in the intervention. It is the basic part of the instrument as described in the previous paragraph. In this part, numbers of words and various parts and figures of speech are counted in the first and last pieces of writing of the intervention and a comparison is made.
The second part of RESCORE is more subjective and invites reflection by participants on both the drawing and writing components of the intervention. Results from this part of RESCORE relate to both the student survey and the judges' evaluations of student journals.

RESCORE was designed to function simultaneously as a pre- and post-test, with student involvement in the analysis.

RESCORE was administered to students on the same day and immediately following their completion of the Opinion Survey of the Creative Journal Activity.

Twenty-five subjects participated in the RESCORE procedure. Twelve of the respondents were upperclassmen who worked on the instrument on Wednesday of the last week of the experiment because "Senior Skip Day" was the Friday of that week and many in the group were expected to be absent. RESCORE for the Freshman sample of 28 was scheduled for Friday, as they were supposed to be in school. However, 15 of the 28 chose to "skip" with the Seniors thereby reducing the Freshman component to 13 subjects. The remaining 7 of the 47 students in the experimental group were not given RESCORE because their participation in "Draw to Learn" was limited to two sessions. It was agreed that these students had not had sufficient involvement in the program to be meaningfully involved in RESCORE.

Anecdotal responses by the two groups who did the RESCORE procedure were quantitatively different: 11 of the 12 upperclassmen wrote comments on and/or responded to the qualitative checklist part of RESCORE, whereas only 5 of the 13 Freshman respondents did so. Information about these responses is included in the section of this chapter devoted to anecdotal material.
The writing analysis component of RESCORE was too challenging for most of the students. While some completed it adequately, others did not, either refusing outright or making partial or inappropriate efforts. The first question ("number of words in the first and the last sample") was answered by most subjects. The researcher then analyzed the first question in remaining writing samples, which brought the final count to 45. In 16 cases, the number of words dropped between the first and last writings and, in 22 cases, the number of words increased. For the balance of cases there was no change. A T-Test for paired samples was used to analyze these results and revealed a statistically significant difference between first and last word counts (P=>.05). The population wrote significantly fewer words at the end of the intervention than at the beginning. However, there was a considerable range of responses, with the "last" count maximum exceeding the "first" count. The first count ranged from 0 to 100 words, while the last count went from 0 to 122.

Seventeen of the 25 RESCORE respondents answered two qualitative questions in RESCORE. These questions were: "Was there a change in your writing?" from part I and "Has drawing helped your writing?" from part II. The "yes" and "no" responses to these questions were tallied and submitted to a Chi-square analysis (see figure 4.2), which revealed no relationship between subjects' observations of changes in their writing and any perception they had about the influence of their drawing on their writing.

Further analysis of the writing samples could be done using the RESCORE instrument. However, the researcher decided not to pursue
Figure 4.2 Chi-square analysis

that possibility in this report because the generally meager response by participants was consistent with other data in indicating a weak role for the writing component of the "Draw to Learn" intervention.

The Sheridan study also encountered some problems with completion of RESCORE. These will be described in Chapter 5, along with a general discussion of the instrument itself, and possible adaptations for improvement.

4.4 Panel Analysis of Selected Journals

Twenty of the creative journals produced by the 47 students in the experimental group were selected at random for analysis by a panel of three judges. The panel met the week after the completion of the intervention and used a "Student Journal Analysis Sheet" (SJAS) form developed by the researcher as a guide for analyzing and evaluating the selected journals (see Appendix B).

Judges were asked to study each of the 20 journals for the drawing and writing components of all entries. Analysis focused on engagement with the tasks, on qualities of the products and on changes in performance from entry to entry. Each SJAS concluded with a general evaluation component which consisted of five questions and which asked for "an overall sense of the creativity and self-expression" in the particular journal being examined.

The various analytical tasks in the SJAS were designed to give judges a consistent pattern for becoming acquainted with each
student's work and to provide them with uniform reference points on which to base their evaluations. The overall process for evaluating the journals was adapted from the Consensual Assessment Technique developed by Amabile (1983) for the panel of judges she used in her study on motivation and creativity. (See Chapter 2 for a description of the Consensual Assessment Technique and Appendix E for criteria.) Most of the terms in the drawing analysis portion of the SJAS also came from the Amabile study.

The three judges were people who were familiar with the field of creativity but who had not, themselves, used the "Draw to Learn" process in their work. The judges completed the project in a single, six-hour session the week after the intervention at Weaver High School was over. At the beginning of the session, each judge was given a folder containing the proposal abstract, a copy of the definitions of the terms used in the study, the agenda for the day, and a sample of the SJAS. The researcher went over the contents of the folder, gave a brief overview of the study, and explained the procedures used in the research. Then she went over the SJAS item by item with the judges to be sure they understood how to work with it. Orientation was completed with an overview of the Consensual Assessment Guidelines that they were expected to follow as they studied and evaluated the students' journals.

Each judge received pencils and 20 SJAS forms. Each set of 20 forms was printed on a different color of paper to facilitate ready identification of each judge's work.

The SJAS consisted of seven sections labeled A through G. Sections A through F engaged the judges in a study of individual

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drawings and writings. Section G asked for the judges' overall evaluation of the journals as part of the "Draw to Learn" intervention.

All data from the SJAS were analyzed by computer except for responses to questions C, E3, and F. The latter three were a mixture of anecdotal and numerical information which did not lend itself readily to computer inputting. Material from these questions is described in the Anecdotal section of this chapter.

Means, standard deviations, and frequency distributions of responses to all the other questions were provided by computer analysis. In addition, ANOVA (single variance) was used to determine degree of consistency among the judges' scores.

Some of the frequency distribution data were used to provide additional information which is described after the following report on the ANOVA results.

ANOVA revealed significant agreement among the judges for 53 of 54 (98%) assessments made about the students' drawings. There was significant variance among the judges only on the evaluation of "expression" in Drawing Number 1 (see Table 4.6).

Agreement among judges was not quite as consistent for the analyses of the students' writing as it was for the drawing (see Table 4.7). While they were in accord in their evaluations of student "engagement in writing," there was less unity about the locations of students' expressions of positive and negative attitudes in their writing.

84
Table 4.6

ANOVA (Single Variance) Judges and Student Drawings
(p values [.05, H₀ sustained])

<table>
<thead>
<tr>
<th>Drawing #</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUALITY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engagement</td>
<td>.934</td>
<td>.692</td>
<td>.946</td>
<td>.518</td>
<td>.513</td>
<td>.724</td>
</tr>
<tr>
<td>Pleasing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>color</td>
<td>.086</td>
<td>.692</td>
<td>.739</td>
<td>.969</td>
<td>.858</td>
<td>.933</td>
</tr>
<tr>
<td>shapes</td>
<td>.153</td>
<td>.382</td>
<td>.875</td>
<td>.878</td>
<td>.478</td>
<td>.651</td>
</tr>
<tr>
<td>flow</td>
<td>.062</td>
<td>.374</td>
<td>.540</td>
<td>.788</td>
<td>.273</td>
<td>.608</td>
</tr>
<tr>
<td>overall</td>
<td>.200</td>
<td>.369</td>
<td>.722</td>
<td>.786</td>
<td>.342</td>
<td>.786</td>
</tr>
<tr>
<td>Balance</td>
<td>.098</td>
<td>.385</td>
<td>.814</td>
<td>.681</td>
<td>.411</td>
<td>.829</td>
</tr>
<tr>
<td>Complexity</td>
<td>.245</td>
<td>.394</td>
<td>.867</td>
<td>.632</td>
<td>.450</td>
<td>.759</td>
</tr>
<tr>
<td>Command</td>
<td>.160</td>
<td>.534</td>
<td>.789</td>
<td>.730</td>
<td>.565</td>
<td>.887</td>
</tr>
<tr>
<td>Expression</td>
<td>.001</td>
<td>.073</td>
<td>.224</td>
<td>.321</td>
<td>.237</td>
<td>.648</td>
</tr>
</tbody>
</table>
Table 4.7  
ANOVA (Single Variance) Judges and Student Writings  
(p values [>.05, H₀ sustained])  

<table>
<thead>
<tr>
<th>A. Writing #</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engagement</td>
<td>.093</td>
<td>.146</td>
<td>.885</td>
<td>.464</td>
<td>.585</td>
<td>.358</td>
</tr>
<tr>
<td>B. Location in Journal:</td>
<td>none</td>
<td>beginning</td>
<td>throughout</td>
<td>end</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>.036</td>
<td>.042</td>
<td>.687</td>
<td>.046</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>.159</td>
<td>.122</td>
<td>.071</td>
<td>.025</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Given the choices "none," "beginning," "throughout," and "end" of journal, the judges were in accord only in finding (or not finding) negative attitudes "throughout." There was greater conformance for the finding of positive attitudes: assessments for "none," "beginning," and "throughout" locations showed no significant difference. The only uncertainty was around the "end" assessment. Some of the journals had very few writing samples which made it difficult for the judges to do comparative assessment. The "end" location, therefore, might not have functioned usefully for them.

Out of 14 assessments made of the writing, the judges were significantly consistent for ten (71%). Removing the "end" item changes the ratio to ten out of 12, bringing the percentage of significant agreement up to 83%.

ANOVA results established a highly significant consensus among the judges in their evaluations of the students' drawings (98%) and for most of the writing assessment components (71% or 83%, depending upon the inclusion or exclusion of the "end" item). Thus, a standard reliability was established for their overall evaluations of the journals in the last section (G) of the SJAS.

The final section of SJAS asked for judges' overall evaluation of the journals as part of the "Draw to Learn" goal of enhancing creativity and self-expression. This section consisted of five questions with a Likert Scale response format and is duplicated below in Table 4.8.
Table 4.8

Section G of SJAS

"What is your overall sense of the creativity and self-expression in this journal?"

1. Draw to Learn stimulated creativity in the form of drawing . . . . . . . . . . SD D N A SA
2. Draw to Learn stimulated thinking . . . . . . SD D N A SA
3. Draw to Learn generated the expression of thinking in the form of writing . . . . . . SD D N A SA
4. Draw to Learn increased self-expression through: (a) drawing . . . . . . . . . . SD D N A SA (b) writing . . . . . . . . . . SD D N A SA

Both ANOVA and frequency distribution analyses of responses to Section G of the SJAS support the goal of the intervention. Table 4.9 shows that the null hypothesis for all five of the questions in Section G was rejected at p=>.01, and three at p=>.001.

Table 4.9

p-Values for Responses to Section G of SJAS

<table>
<thead>
<tr>
<th>Question</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>p-value</td>
<td>.004</td>
<td>.000</td>
<td>.000</td>
<td>.001</td>
<td>.000</td>
</tr>
</tbody>
</table>

Bar graphs were made of the frequency distributions of the judges' responses (Figure 4.3). From these graphs, we see that the judges found that "Draw to Learn" stimulated creativity in drawing, stimulated thinking, generated expression of thinking in writing, and
Figure 4.3. Bar Graphs of Judges' Responses to the 5 Questions in Section G of SJAS  Continued, next page.
(N.B.: In each case (A) graph shows distributions for all 5 answers and (B) shows distributions with SD and D combined and SA and A combined. In (A) 1-SD, 2-D, 3-N, 4-A, and 5-SA.)

Figure 4.3. Continued
increased self-expression in drawing and writing in many or most of the journals they analyzed. Furthermore, their responses were in accordance with other results from the study in indicating that performance in writing was weaker than performance in drawing in the "Draw to Learn" intervention.

Two additional uses were made of the frequency distributions of judges' responses. First of all, responses to questions C and F were studied. Neither of these questions had been analyzed by computer because they were predominantly anecdotal in content. However, the first part of each question could be tallied because it asked for a "yes" or "no" answer. (The judges were asked if they had seen any change either in the drawing in the journal [C] or in the writing [F].) Responses to these questions were graphed and are shown in Figure 4.4. They further confirm the judges' perceptions that "Draw to Learn" stimulated students' productivity in drawing and writing, and are congruent with other indications that the drawing activities had a greater impact than the writing ones in the intervention.

The second additional use of frequency distributions drew on the computer-generated data for responses to each question in the drawing analysis part of the SJAS. The total percentage of "agree" (SA plus A) was calculated for each assessment of each drawing and then was arranged in both tabular (see Table 4.10) and scattergram (see Figure 4.5) formats. These results first show a uniformly higher rating for "engagement with drawing" than for any of the individual qualities of the student work. (A separate line was drawn on the scattergram for "engagement.") Secondly, the results overall reveal a pattern of
C (1) Did the engagement with and/or qualities of the drawings change within the sample?

F (1) Did the engagement with and/or qualities of the writing change within the sample?

Y = YES
N = No
Ab = Absentees

Figure 4.4. Judges' Responses to Questions C(1) and F(1) of SJAS
Table 4.10

Combined Percentages of Agree/Strongly Agree Responses by Judges for Qualities Assessed in the Drawing Component of SJAS

<table>
<thead>
<tr>
<th>DRAWING</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engagement</td>
<td>73</td>
<td>94</td>
<td>66</td>
<td>74</td>
<td>84</td>
<td>81</td>
</tr>
<tr>
<td>Pleasing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>57</td>
<td>64</td>
<td>41</td>
<td>55</td>
<td>58</td>
<td>53</td>
</tr>
<tr>
<td>Shapes</td>
<td>58</td>
<td>55</td>
<td>49</td>
<td>59</td>
<td>58</td>
<td>63</td>
</tr>
<tr>
<td>Flow</td>
<td>57</td>
<td>64</td>
<td>49</td>
<td>49</td>
<td>55</td>
<td>58</td>
</tr>
<tr>
<td>Overall</td>
<td>55</td>
<td>66</td>
<td>56</td>
<td>51</td>
<td>62</td>
<td>63</td>
</tr>
<tr>
<td>Balance</td>
<td>57</td>
<td>62</td>
<td>59</td>
<td>54</td>
<td>69</td>
<td>63</td>
</tr>
<tr>
<td>Complexity</td>
<td>57</td>
<td>60</td>
<td>41</td>
<td>51</td>
<td>53</td>
<td>58</td>
</tr>
<tr>
<td>Command</td>
<td>62</td>
<td>66</td>
<td>62</td>
<td>56</td>
<td>72</td>
<td>53</td>
</tr>
<tr>
<td>Expression</td>
<td>45</td>
<td>51</td>
<td>38</td>
<td>56</td>
<td>69</td>
<td>58</td>
</tr>
</tbody>
</table>

| n       | 20 | 18 | 13 | 13 | 10 | 7 |

fluctuation that rises at the beginning and towards the end, dips in the middle, and possible at the end. Although the small size of the sample for the fifth and sixth drawings brings caution to this analysis, the results do corroborate judges’ comments. During their analyses of the journals, they frequently speculated about the possibility that they were observing regression in the students’ work. Some of their comments as well as those made by students and the researcher’s own observations will be presented in the next and final section of this chapter.
Figure 4.5. Scattergram for the Data Tabulated in Table 4.10
4.5 **Anecdotal Material**

The "Draw to Learn" intervention generated three kinds of anecdotal material: classroom observations made by the researcher, student comments and responses on the RESCORE, and descriptive statements from the judges about the student journals.

The researcher made notes after each session about the behaviors she observed in the classroom; about procedural reminders, and about ideas for further elaboration of "Draw to Learn." The following descriptions are based on those notes (see Appendix G for a summary of the notes).

Although each session had its share of noisy complaints and objections, plus "ranking," giggling, and chatter-filled spontaneous sharing, there always was a high level of participation and only one student refused absolutely to be involved in the experiment. Each group also had a silent contingent who worked quietly in total absorption, and frequently the initial hubbub died out completely as everyone present became engaged in the activity.

In general, students were more interested in the drawing component of the intervention and it was difficult to get them to make a transition to writing.

As the intervention proceeded, the researcher varied the drawing and writing tasks and also introduced information relating to "Draw to Learn." The latter was generally interesting to the participants. First, the researcher shared information about her teaching career, her interest in "Draw to Learn" and creativity, and the research project. Information about the brain followed in a subsequent session of the intervention and the week after that the session was devoted to
non-objective art as it appears in student lives in the form of fashion design, interior decoration, and works by Contemporary artists. These information sessions appeared to be of interest to the students because they asked many questions, made numerous comments, and engaged in discussions that had to be terminated in order to continue with the intervention.

All four administrations of the T.T.C.T. test encountered resistance, disbelief, and skepticism among participants. The first activity in the T.T.C.T. proved "uninteresting" in general to each group, whereas interest and engagement with the remaining parts increased for the majority of the subjects. It appeared that the test might be teaching itself to them. To this general response to the T.T.C.T. may be added evidence of further discontent among the experimentals about the post-T.T.C.T., with several voiced opinions in favor of continuing the usual drawing activity.

The Self Report Questionnaire was generally well received, although one student objected to it vociferously and mechanically marked SD to the second half of the instrument (questions 15 to 30) (see Appendix C). However, all the others were cooperative and appeared to be knowledgeable about the format of the instrument.

RES CORE, on the other hand, required considerable explanation and evoked "what’s this stuff?" and "I can’t be bothered" attitudes among the students. Because there was a general atmosphere of exhaustion with school among the students, the researcher suggested that the subjects do what they could with RESCORE and hand it in when they felt finished. Quite a few students were not able to fully analyze their work. In addition, some of these, plus others, did not
respond to all the sections of RESCORE. Nevertheless, quite a few comments were made (see Appendix D), many of which, particularly in response to questions about drawing, are congruent with the hypotheses that "Draw to Learn" enhances creativity and self-expression. Several students observed that they wrote more, and one remarked that writing had changed by "elaborating on my story and my shapes/lines."

In the RESCORE instrument, students were provided with a check list for responding to the question "if drawing has helped you write, how has it helped?" "I get more ideas" was marked by six students, as was "working with colors is fun." "I get new ideas" had four responses, and "it brings back memories" had three.

Opportunities for reflecting on drawing were provided in the latter part of RESCORE, and elicited such remarks as "the more you draw, the more you have something to write about," "it relaxed my mind," and "I thought of many designs. It made me think of other things."

In general, the students' comments indicated that the drawing dimension of the intervention had a greater impact than the writing one.

Comments from the judges were elicited in sections C, E, F, and G5 of the SJAS. These responses are tabulated in Appendix J. The questions asked in C, E, F, and G5 are listed in Figure 4.6.

The judges' responses to C, E, F, and G5 of the SJAS varied in elaboration and volume, with each demonstrating a generally consistent style. One judge tended to be sparse with her comments, one was very descriptive, and the third fell somewhere between the other two
C. Did the engagement with and/or qualities of the drawing change within the sample?

   1. yes or no
   2. how did the drawings change?
   3. when did the drawings change?

E. Qualities of the writing

   1. References to childish, silly, weird, etc.:
      none / beginning / throughout / end
   2. Positive attitude expressed:
      none / beginning / throughout / end

F. Did the engagement with and/or qualities of the writing change within the sample?

   1. yes or no
   2. how did the writing change?
   3. when did the writing change?

G. 5 Comments

Figure 4.6. Sections C, E, and F of SJAS extremes. Despite style differences, the comments, overall, reflected the significant consensus established by the ANOVA.

   Samples of judges’ remarks about two of the journals are shown in Figure 4.7 (all of the judges’ comments are tabulated in Appendix J). These two examples demonstrate both the style differences of the judges’ responses and their overall concurrence in their observations. The style differences were consistent throughout all the journal analyses. The content of the observations showed more variation. However, the lack of unanimity was, in most cases, due to a missing response rather than a disagreeing answer. Several of the randomly selected journals were ones with fewer than six entries and this made it difficult for some of the judges to answer some of the questions.
<table>
<thead>
<tr>
<th>Judge:</th>
<th>Orange</th>
<th>Yellow</th>
<th>Peach</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Journal #10</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Drawing</strong></td>
<td>Drawings became more personal, more ideosyncratic, symbolically potent, the necessity to communicate &amp; express powerfully began to dominate.</td>
<td>From abstract to symbolic or story-telling</td>
<td>Not much change until session 6 (last drawing) then really seems to reflect person in drawing with things in her life.</td>
</tr>
<tr>
<td><strong>Writing</strong></td>
<td>The press to communicate becomes stronger and stronger. The drawing &amp; writing combo become more essential. Big change in #4 to emotional outburst opens up whole emotional realm.</td>
<td>More concerned w/current life sex, problems w/mother, birthday, resentment over task. #4 became angry.</td>
<td>At first, seems resistant to writing but over each session opens up more &amp; more. Finally begins to reflect in session 5 &amp; 6.</td>
</tr>
<tr>
<td><strong>Comments (65)</strong></td>
<td>The press to communicate became so strong. The process allowed for outbursts. He needs/wants both drawing/writing simultaneously.</td>
<td>The drawing released emotions, violence, reflection.</td>
<td>Writing &amp; drawing don't seem related to each other. Seems to take the drawing activity seriously but &quot;blows off&quot; written activity (to avoid exposing himself?).</td>
</tr>
<tr>
<td><strong>Journal #13</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Writing</strong></td>
<td>Always symbolism, emotional content. This person's particular life events become more essential. In and out of abstraction. Communicating meaning more &amp; more vitally important Words more &amp; more vitally important.</td>
<td>More personal -about life- less interpretive of the drawing.</td>
<td>Change seems related to willingness to communicate &amp; open himself. Each time admits it's not going way he wants, but still jumps in.</td>
</tr>
</tbody>
</table>

Figure 4.7. Judges' Comments about Journals #10 and #13
Overall, the judges' reactions to questions C, E, F, and G5 reflect a sincere interest in the journals and an appreciation of the students' efforts. The weak role of writing in the intervention is not as apparent in this material as it is in all the other data that have been presented in this chapter.

Further interpretation of the results as they relate to the "Draw to Learn" study, along with a discussion of possible implications of the intervention, and suggestions for further investigation will be presented in Chapter 5.
CHAPTER 5

CONCLUSIONS

5.1 Introduction

This final chapter describes and summarizes research findings reported in Chapter 4. In addition, the significance of the results is discussed and limitations of the study are noted. The chapter concludes with a consideration of possibilities for further research.

Overall, the data and observations that emerged from this study indicate that the intervention stimulated some changes in the performances and perceptions of the participants. However, the results as they relate to the original suppositions are mixed and do not clearly sustain the hypothesis that the "Draw to Learn" procedure enhances creativity and self-expression.

Two of the four suppositions that were intended to support the original hypothesis were not met. The first of these suppositions claimed that enhanced creativity would be demonstrated by higher post-over pre-test scores in some or all dimensions of the Torrance Test of Creative Thinking (T.T.C.T.). The opposite occurred: there was a significant drop in post-test results for the experimental group and no change for the control group.

The second supposition proposed that enhanced self-expression in writing would be demonstrated by increased post-over pre-test scores in RESCORE. Measurements in this case also went in the opposite direction with the final writing samples containing significantly fewer words than the ones at the beginning of the intervention.
Outcomes from the other two suppositions were more promising. The third supposition that a randomly selected sample of student journals would be judged to show growth in creativity and self-expression met expectations, although the judges indicated that the journals reflected greater enhancement of creativity and self-expression in drawing than in writing.

The fourth and final supposition claimed that students would report increased creativity and self-expression in an opinion survey questionnaire. Results were also mixed in this part of the study. Enjoyment of the drawing process, surprise and pleasure with the products, and self-awareness of cognitive stimulation supported the hypothesis while several responses, including a strong negative reaction to the claim that drawing created an urge to write, refuted the hypothesis.

The results also indicated that the drawing component of the intervention had a greater impact than the writing one, that the time available was probably insufficient for the purposes of the intervention, and that the subjects were not accustomed to the kinds of creative and self-expressive activities that constitute the "Draw to Learn" program.

The latter observation distressed the researcher and was viewed by her as severe cognitive deprivation. However, finding this condition among the subjects was not surprising, because of the researcher's familiarity with the literature (Resnick, Torrance, Costa, etc.) and her own personal experiences as a classroom teacher in several schools, including the site of the intervention.
The results that differed radically from the original suppositions have led to speculations about several aspects of research in the field of creativity. One of these is the use and administration of tests and another is the possible relevance of a currently popular change model to stages in creative behavior.

5.2 Description and Summary of Research Findings

This part of Chapter 5 concentrates on the Research Findings from the "Draw to Learn" intervention. It is divided into four sections to accommodate considerations about each of the four separate procedures that were used to collect data, T.T.C.T., and a fifth section which describes the role of time in the intervention.

5.2.1 The Torrance Test of Creative Thinking

The results of the pre- and post-tests for the control groups indicated no change in the performance and this outcome was proposed in the original suppositions. These suppositions also predicted that the scores for the experimental group would increase as compared to the controls. However, quite the opposite occurred. The experimental group's performance dropped significantly in the post-test as compared to the controls (see Tables 4.1 and 4.2, pages 66 and 67).

A detailed analysis of the Creativity Index scores of individuals for whom both pre- and post-test scores existed (n = 40, experimental group; n = 47, control group) was conducted to determine if there were any patterns of unusual performance among subjects in the two groups. While there were individuals whose post-test scores were either higher or lower than their pre-test scores, in general, more controls than experimentalists improved and fewer controls than experimentalists declined. Therefore, the analyses of individuals was
consistent with the overall T.T.C.T. results. No cluster of super-performers was found within either group.

The T.T.C.T. results in this study have led to further research about the test, including an examination of the Cumulative Bibliography on the T.T.C.T, and further reading about current issues relating to testing for creativity and creative thinking. Two issues of particular relevance to this study are the role of coaching before testing, and the role of congruence of content between instructional material and test material. Both of these issues have emerged as concerns not only for the T.T.C.T., but also for the Sheridan RESCORE and will be explored along with other matters in the discussion section of this chapter.

5.2.2 RESCORE

The RESCORE instrument developed by Sheridan (1990) concentrated on the writing component of "Draw to Learn." It was supposed that there would be an increase in writing at the end of the intervention, and that this increase would be a sign of enhanced self-expression.

Overall, this supposition was not confirmed by the results, although there were some individuals who met expectations.

RESCORE proved too challenging for many of the subjects. For example, one student counted 25 words in her final writing sample, and then marked a count of 23 for similes. Therefore, only data on the number of words in the first and last writing samples were analyzed, because the reliability of the other counts was questionable and because, in many cases, there were no responses to the other items (see RESCORE in Appendix A).
The word counts indicated that word production varied among the subjects, with some writing more and others less, but that overall the drop in word production predominated.

Chi-square analysis of responses about drawing and writing indicated that a significant part of the sample perceived no relationship between the two activities (see Figure 4.2, page 80). A similar finding occurred in the analysis of the Opinion Survey results. However, anecdotal responses to RESCORE by students indicate that some students did perceive a relationship between their drawing and their writing. One student commented, "The more you draw, the more you have something to write about." And another noted that drawing helped writing, "because you have something specific to write about."

The checklist for the question "If drawing has helped you write, how has it helped?" (see page 2 of RESCORE in Appendix A) was completed by 17 of the 25 respondents. One response each was recorded for "it makes writing interesting" and "my writing is more organized." There were two responses each to "it is easier to write" and "I don't worry about mistakes," and three marks for "I put in more details" and "it stimulates my memory." Six subjects reflected awareness that their imaginations had been stimulated by marking "I get more ideas." Although the data are meager, they do indicate that a few of the subjects in the intervention did connect the drawing and writing components of "Draw to Learn."

Several findings from RESCORE are consistent with results from the Opinion Survey and are described in the section of this Chapter that is devoted to the latter topic.
Some of the difficulties with RESCORE that were encountered by this researcher are similar to those experienced by the instrument’s originator, Susan Sheridan. She, too, found that some of the grammatical terms in the word count part of RESCORE did not generate useful data and that her subjects were resistant to the test at the end of the intervention. However, she chose to retest after a period of both incubation and coaching and obtained better results.

As was mentioned earlier in this chapter, the issue of coaching will be examined in the discussion section because both Sheridan and Torrance advocate it for their tests, and none was used in "Draw to Learn."

5.2.3 Opinion Survey Questionnaire

Thirty-one subjects were present the day the Opinion Survey Questionnaire and RESCORE were administered. All 31 completed the survey, and 25 worked on RESCORE.

Pleasure with drawing and awareness of cognitive stimulation are reflected in the results from both instruments. (See Appendix H for bar graphs of responses to the Opinion Survey and Appendix D for student responses to RESCORE.)

In RESCORE, the item "working with colors is fun" received the most (8) responses on the checklist. Similarly, on the Opinion Survey, "drawing is an enjoyable activity" received only 3 negative responses out of 31 (Question 1) and only 6 would not admit to being pleased with their drawings (Question 12).

Responses to the RESCORE checklist indicated awareness of cognitive stimulation that was consistent with the survey, although the amount of the response was less significant. The six checks for
"more ideas," the five for "new ideas," and the four for "memories" are congruent with such survey items as:

"my pictures often surprise me" (Question 4)
"I find I get ideas while I am drawing" (Question 2)
"Drawing helps me think" (Question 2)
"My drawings help my memory" (Question 19)

In all four instances, the majority of the respondents agreed with the statements. The question about getting ideas received the least disagreement thus corresponding with nine total checks for ideas in RESCORE. The memory item in the survey was also strong, with 12 "agrees" and nine "uncertains," thereby enhancing the RESCORE results of four "memory" responses.

Responses to the questions about writing in the Opinion Survey correspond to and further amplify those obtained from RESCORE. For example, no one checked "I write more" in RESCORE, and no one agreed to "When I draw I get the urge to write" in the survey (Question 18).

A few subjects admitted that drawing made writing easier (item 11-2 in RESCORE; Question 15 in the survey), but the response was meager and reminiscent of the data about seeing connections between the drawing and writing components of "Draw to Learn." Similarly, while no one would admit that drawing gave them the urge to write, there were a few who agreed that drawing could stimulate and assist writing (Questions 9 and 27).

The Opinion Survey Questionnaire results, therefore, further support the perception that the writing component of the intervention was weaker than the drawing one. Yet the presence of some "agree" responses and many "undecided" ones indicates some impact of "Draw to
Learn" on the subjects' perceptions of a relationship between their drawing and writing activities.

Several additional generalizations can be inferred from the Opinion Survey Questionnaire results. First of all, they support the concept that participants were engaging in internal dialogue related to common blocks to creativity, because many agreed with the following claims:

"I feel like the drawings have to have meaning while I am doing them" (Question 14).

"I feel silly when I am doing my creative journal" (Question 11).

"I feel I should be doing something more useful when I am drawing" (Question 3).

"I keep thinking I should do a better job" (Question 8).

Feeling silly (Question 11) or that one should be doing something more useful (Question) address a belief that productive work must always be practical. While this belief is common, research in creativity has established that playful, open-ended activities can generate ideas for practical applications. It is also well established that judgment hinders creative production; thus, those who agreed with thinking they should do a better job (Question 8) or that the drawings had to have meaning (Question 14) might have been reflecting a judgmental state of mind. The substantial agreement with these questions is consistent with students' classroom verbalizations about the intervention. Not all of them made remarks, but there were some at all sessions, especially as they began the "Draw to Learn" activity.
Another generalization from the Opinion Survey is that many students expressed a positive attitude toward "Draw to Learn." They told others about the experiment (Question 27); they showed their work to others (Question 7); and they claimed that everyone should do "Draw to Learn" (Question 25). Although there was greater uncertainty about overtly admitting to liking the project (Question 8) with "undecided" predominating, more "agreed" than "disagreed." The predominance of a positive attitude is congruent with the sense of pleasure previously noted in the questionnaire as well as in RESCORE.

One can also generalize about transfer. Just as the RESCORE results indicate no significant sense of relationship between the drawing and writing components of "Draw to Learn," so also did the subjects fail to connect "Draw to Learn" with their lives. They were negative or uncertain about continuing the creative journal or about using it in other classes, and they denied perceiving that "Draw to Learn" could help them solve problems or think about their lives.

The final generalization from the Opinion Survey Questionnaire is about self-images. Two-thirds of the respondents claimed they could express themselves in writing and roughly the same proportion considered themselves creative. Only about one-third of the respondents perceive themselves as good at drawing. While the researcher and the three judges agreed that the subjects were creative, their opinions of the writing and drawing were the opposite of the questionnaire results because they considered the drawing to be better than the writing.

The fourth supposition of the original research proposal claimed that students would report increased creativity and self-expression in
an opinion survey questionnaire. The results of the questionnaire indicate that the students' reactions to "Draw to Learn" were mixed. There was greater support for the original supposition in the drawing component of the intervention than in the writing one.

5.2.4 Student Journal Analysis Sheet (SJAS)

The third supposition of the research proposal stipulated that "a randomly selected sample of student journals will be judged to show growth in creativity and self-expression over the period of the intervention." This supposition was met because the three judges who examined the 20 journals were generally consistent in their analyses and agreed with the five final evaluative questions of the SJAS which focused on the purposes of the intervention.

The responses to the first of the final questions, which stated that the drawing stimulated creativity and self-expression in the students whose journals they evaluated, were in almost total agreement. There was somewhat less unanimity about the claim that "Draw to Learn" stimulated thinking. The "agree" responses still predominated and there were no "disagrees," but there was an increase in the percentage of "undecided" responses. Only in the judgments about writing did the "disagree" response appear. Responses to "Draw to Learn increased self-expression through writing" and "generated the expression of thinking" were about 20% "disagree," and the uncertain rate was about 33%. Thus, judges and students were in accord in rating the drawing component of the intervention higher than the writing one.

In studying the judges' responses to questions about the qualities of the students' drawing activities, the researcher realized
that a scattergram could be constructed from the percentage distributions of the judges' responses. The "agree/strongly agree" percentages were combined for each quality (such as "engagement," "balance," etc.) and used as the data for the scattergram (see Figure 4.5, page 92). Two lines have been drawn in this figure because the numbers for "engagement" run consistently higher than for the other qualities.

A rough curve emerged that evoked the change curve pattern popularized by Kubler-Ross for recognizing the stages of grief, and now considered operant by her and others for all kinds of change (see Figure 5.1). This raises the possibility that the subjects were in a change process at the time the intervention was ended and that results might well have been different if more time had been available.

There were additional considerations about the element of time which will be described in the following section. Further speculations about a change model are included in the section of this chapter that is devoted to discussion.

5.2.5 The Element of Time

Time was a constraint throughout the study, with several aspects combining to compound its impact.

First of all, the researcher's overall contact time was limited both by the number and length of her visits. The time allotment consisted of one classroom period per week for six weeks, plus three periods for testing and one period for introductions and explanations. In addition, the class periods at the school were only 42 minutes long, and precious time had to be used in each visit for the distribution of materials. The latter procedure was necessary to
Anger

Source: E. Kubler-Ross (1975), p. 161.)

"The stages of dying that I have described apply equally to any significant change . . . in a person's life, and change is a regular occurrence in human existence." (p. 145)

Figure 5.1. Seven Stages of Grief or The Stages of Change

insure that the paper, markers, and journals would be available for each session.

Comings and goings, announcements, and student interactions also slowed the proceedings, as did the researcher's own comments and instructions. It quickly became apparent that there would not be adequate time for fully productive sessions of "Draw to Learn." It was also apparent that it would be difficult to give full value to both the drawing and writing activities.

As was described in Chapter 4, many of the students became absorbed with their drawing work immediately, and almost all of them became engaged within a few minutes. In order to have time within the period for writing, the researcher had to interrupt the students in
each session to make the transition from the drawing to the writing.
There never was time for a full exploration with the drawing, and even
less for the writing. Even though many of the subjects did not have
writing skills congruent with their ages, the discrepancy between the
drawing and writing results that emerged from this study could be
attributed in some part to the time factor. The students didn’t have
enough time to finish their drawings, nor to reflect and write about
the thoughts and ideas that came to them as they drew.

The time constraint also made it impossible to arrange for
students to share and discuss their work. While many students
spontaneously shared their drawings with classmates, there were no
opportunities for more formalized displays, discussions and/or
critiques.

The time of year also impacted on the students. They were
distracted by the prospects of final exams and summer vacation.
Special events for seniors, standardized testing, award ceremonies,
and other special occasions were also much on their minds. One could
speculate that many of the subjects did not want to be bothered with
something they perceived as tangential to their school life.

Collection of results from the Student Opinion Questionnaire and
RESCORE was definitely affected by the time of year. Twenty-two
students of the 47 in the experimental sample were absent the day
these two instruments were administered. Although none were seniors,
it was "Senior Skip Day," and they were playing hookey. The seniors
in the experiment had been tested earlier in anticipation of their
absence, but the younger students’ behavior was not expected and came
as a surprise to their teacher.
5.3 **Discussion of Results**

Perhaps the most striking result in the intervention was the drop in the T.T.C.T. post-test scores for the control group. The T.T.C.T. was selected because of its widely accepted use as a test of creativity. Recently, this acceptance has been challenged (Baer, 1993) with assertions that T.T.C.T. only tests its own activities. The fact that Torrance advises coaching for the post-test (Torrance, 1987c) strengthens these assertions because the results would be influenced by the coaching and it would be difficult to claim that the intervention alone played a part in post-test results.

Sheridan also used coaching with RESCORE. She found that the subjects did not perform well on the post-tests and speculated that they were saturated by her "Draw/Write" intervention. She gave them some time off, provided some coaching, and then administered a follow-up post-test. Scores on the latter were better than those on the original post-test.

No coaching was done with "Draw to Learn" because the researcher believed that coaching would contaminate the results by making it unclear whether the results were due to the intervention or to the coaching, or to both. The supposition in each case was that the content of the test instrument was congruent with the "Draw to Learn" material. Possibly this was not the case.

While the students in "Draw to Learn" were engaged in open-ended, divergent activities not too different from the T.T.C.T., these activities were self-generated and proactive, whereas the T.T.C.T. activities asked for responses to materials produced by others. In addition, even though there was a time constraint, each "Draw to
Learn" session invited the student to focus on and develop a single product, whereas the T.T.C.T. asked for the development of many products in ten-minute segments. Thus, it is possible to speculate that the differences between T.T.C.T. and "Draw to Learn" were sufficient to claim that T.T.C.T. couldn't measure the creativity generated by "Draw to Learn." It is also possible that subjects resisted the T.T.C.T. because they did not like it as much as doing their own "Draw to Learn" activities. Certainly that attitude was openly expressed in the testing situations.

The significant drop in writing reflected in RESCORE results might also have been a form of resistance. As students became more accustomed to "Draw to Learn," they might have become more interested in exploring the possibilities in the drawing activities than in writing. The strong denial that drawing gave them an urge to write could support that speculation.

Torrance advises against testing in the month of May, because of end-of-year distractions (Torrance, 1973). Since the "Draw to Learn" intervention took place in May, one could speculate that the post-test score drop for the experimentals could be explained on that basis. However, timing should then affect the controls as well, and yet there was no significant change in the behavior of the control groups.

The Kubler-Ross change model (1975) is a possible clue for the T.T.C.T. and RESCORE results, and it is one that does not require the rejection of the instrument as valid for "Draw to Learn." This model claims that all persons experiencing any kind of change in their lives in any way pass through a predictable sequence of affective states as they adapt to their new situations (see Figure 5.1). The scattergram
shown in Figure 4.5 was sufficiently similar to this curve to suggest that the T.T.C.T. post-test and the RESCORE writing results might be reflecting denial or depression states in the experimental subjects. If such were the case, one would expect that a longer intervention might produce different results with the T.T.C.T. and RESCORE as subjects moved towards acceptance of the "Draw to Learn" way of thinking and expressing.

A longer intervention would also provide more time for reflection, discussion, and writing, and this, in turn, might increase the usefulness of RESCORE by making a better match between its content and "Draw to Learn." With more discussion and writing, students might become more aware of the connections between their drawings and their writings, and might show significant increases in the amount and range of their work.

5.4 Conclusions and Limitations of the Study

A general conclusion about the impact of "Draw to Learn" on creativity and self-expression cannot be drawn because the results of the study are mixed. The hypothesis was supported by the judges' responses, portions of the opinion survey, and various reactions of several students. Conversely, the hypothesis was rejected by other portions of the opinion survey, the T.T.C.T., and the RESCORE.

Size and consistency of sample and the element of time were the major limitations of the study. Data for the whole set of 47 subjects were obtained only in the case of the T.T.C.T., whereas the other three measurements provided information from about one-half of the sample. The smallness of the sample, therefore, invites caution in
extending the conclusions of the study and suggests that the intervention be repeated with other populations.

The time limitation may well have played an important part in the outcome of the intervention. With more time, it might have been possible to show a greater effect of "Draw to Learn" on the subjects' writing performance. More time might also have made the subjects more comfortable overall with the intervention and this increased comfort might have enhanced performance on the post-tests and produced more "agree" responses in the Opinion Survey.

The "Draw to Learn" study eliminated nine periods of regular instruction from the participating teachers' schedules. Therefore, increasing the time element in future "Draw to Learn" programs might encounter resistance from teachers. However, in the case of this study, the teachers who were involved appreciated its value as a language arts procedure and invited the researcher to return and do more with the "creative journal." They remarked on the students' engagement with the activities; they appreciated the independent thinking that was encouraged and stimulated by the "Draw to Learn" procedure; and they enjoyed the energy and excitement that was generated by the intervention. Because "Draw to Learn" was very different from regular school work, and because the students remarked on the strangeness of the activities, the teachers' awareness of the importance of creative thinking and self-expression and the need for its inclusion in regular instruction was heightened.

The fact that the subjects found "Draw to Learn" a strange procedure highlighted the researcher's perception that they lacked opportunities for creative thinking and self-expression. But the
positive reactions of the teachers, the data reflecting student
enjoyment, and the enthusiasm of the judges about the journals
encourage the further use of "Draw to Learn."

5.5 **Significance of the Research Findings**

The results of the "Draw to Learn" research are ambiguous. Some
outcomes support the basic concept of this study, which is that people
are creative by nature and that each individual has the capacity to
increase this natural creativity through deliberate instruction and
practice (see page 1). This concept has been espoused by researchers
studying creativity since 1950. Therefore, some of the "Draw to
Learn" findings are significant because they add further support to
that concept.

The negative results from T.T.C.T. and RESCORE may also be
significant in the study of creativity because of the possibility that
those results were reflecting, not a lack of creative growth, but
stages within a change model. This speculation suggests two things:
first, that part of the process of learning new ways of being creative
and self-expressive may involve experiencing the "seven stages of
grief" (see Figure 5.1) (Kubler-Ross, 1975), and, second, that time
plays an important role in both the teaching and assessing of creative
and expressive procedures.

Research findings also highlight the need for including creative
and expressive activities in the education of high school students.
The strangeness of the intervention for the subjects supports the
claims made in Chapter 1 of this study that creativity is not
generally taught, and that there is a need for this kind of
instruction to prepare students for a rapidly changing world.
5.6 Suggestions for Additional Research

The paucity of research about the use of drawing in academic settings in general, and at the high school level in particular, combined with the results of this study, suggest that further studies be conducted with the "Draw to Learn" intervention. By continuing with the present model, but increasing the amount of time for the intervention, it might be possible to determine if the T.T.C.T. and the RESCORE are more effective assessment instruments than they appear to be in this study.

Continuing the model (with the time adaptation suggested above) could be done with similar age groups to add to the size of the sample and determine if the results can be duplicated. Continuing, but with older or younger groups might reveal some age-related factors. Cultural and academic factors could also be explored by focusing on specific populations and using "Draw to Learn" other subjects besides language arts.

These numerous ideas for the use of the "Draw to Learn" model pose a problem of practicality. The model itself, especially with the time adaptation, may be too cumbersome and onerous for repeated use. A streamlined model, using just the Opinion Survey and the SJAS and keeping the time adaptation might prove to be an effective alternative procedure.

The possibility of studying creativity within a change model construct suggests an interesting avenue for future research. Creativity is frequently defined as a process, and change is a process. Researching and comparing the literature about both subjects might lead to some useful new concepts.
Other forms of expression, such as dance and music, could be substituted for, or combined with, drawing to carry out research similar to "Draw to Learn" in many academic settings. Findings in all these instances would be useful data for the field of integrative interdisciplinary instruction.

The possibilities for further research seem endless, and heighten realization that there is still much to be learned about the possible role of drawing as a learning process in academic subjects.
This instrument was developed by Dr. Susan Sheridan, and used in her dissertation (University of Massachusetts, 1990) to study the role of drawing instruction for enhancing thinking and writing among elementary school students.

It has been adapted for use in the proposed study called "Draw to Learn" (Loomis, University of Massachusetts, 1994) that intends to explore the role of drawing combined with writing for enhancing creativity and self-expression among secondary school students.

The first and last products of the "Draw to Learn" intervention are analyzed by the students themselves, using RESCORE.

The original RESCORE designed and used by Sheridan is a qualitative and quantitative, self-scoring, and reflective instrument. The complete RESCORE analyzed both drawing and writing. In this study, only the quantitative analysis of writing will be used. The drawing analysis is not relevant because the drawing techniques are different and data about the drawing component will be collected in other ways.

RESCORE: Verbal Component

You are going to analyze your writing today. You will compare the first writing you did in "Draw to Learn" with the final one by counting words and other parts of speech. The chart below lists the things to be counted, and has two columns. Place the counts from your first writing in the first column and your counts from the last writing in the second column. Your teacher and I will help you work in pairs if you wish.

When you have finished the first part of RESCORE, go on and do the second part.
<table>
<thead>
<tr>
<th>Part of Speech</th>
<th>First Writing Sample</th>
<th>Final Writing Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of words</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of nouns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of adjectives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>number of verbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>number of adverbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>number of similes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>number of metaphors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>number of predictions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>number of hypotheses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>number of analogies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>number of phrases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>number of clauses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>number of sentences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>number of paragraphs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PART II

Has your writing changed? (yes/no)

How has your writing changed?
(Did you write more? What parts of speech did you use more of?)

(Did you write less but use words differently? Which kinds of words? How?)

Do you think that drawing has helped your writing? (yes/no)

If drawing has helped you write, how has it helped? (circle the words in the following list that apply)

1. I get more ideas. 6. My writing is more organized.
2. It is easier to write. 7. It makes writing interesting.
3. I get new ideas. 8. Working with colors is fun.
4. It brings back memories. 9. I don’t worry about mistakes.
5. I put in more details. 10. I write more.

Has your drawing changed since the beginning of the experiment? (yes/no)

How has your drawing changed?

OTHER? (If drawing has helped in other ways, please mention them here.)

Please hand in this RESCORE paper, and the two samples that you analyzed.

Thank you.

Louise Loomis
APPENDIX B

PANEL ANALYSIS OF SELECTED JOURNALS
AND
STUDENT JOURNAL ANALYSIS SHEET (SJAS)
PANEL ANALYSIS OF SELECTED JOURNALS

Agenda:

I. Introduction

Panel
Background of project/Dissertation Abstract
Present situation

II. Journal Analyses

Ground rules
Guidelines for analyses

III. Panel Member Reflections

Student products
The intervention
Overall view of the project and where to go next

IV. Recap Sharing/Discussion
STUDENT JOURNAL ANALYSIS SHEET (SJAS)

Sample # ________

Number of Drawings ____

Number of Writings ____

A. Engagement with the drawing:

1. Low ___________ High ___________
   1 2 3 4 5

2. Low ___________ High ___________
   1 2 3 4 5

3. Low ___________ High ___________
   1 2 3 4 5

4. Low ___________ High ___________
   1 2 3 4 5

5. Low ___________ High ___________
   1 2 3 4 5

6. Low ___________ High ___________
   1 2 3 4 5

B. Qualities of the drawing (1, 2, 3, 4, 5, - Low to High ratings)

<table>
<thead>
<tr>
<th>DRAWING NUMBER</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<tr>
<td>Pleasing: color use</td>
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<tr>
<td>overall</td>
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</tr>
</tbody>
</table>

Balance _______________________________________

Complexity ______________________________________

Command ________________________________________

Expression (affect) ______________________________
C. Did the engagement with and/or qualities of the drawing change within the sample?

1. Yes or no?
2. How did the drawings change?
3. When did the drawings change?

D. Engagement with the writing

1. Low ______ High
   1 2 3 4 5

2. Low ______ High
   1 2 3 4 5

3. Low ______ High
   1 2 3 4 5

4. Low ______ High
   1 2 3 4 5

5. Low ______ High
   1 2 3 4 5

6. Low ______ High
   1 2 3 4 5

E. Qualities of the writing

1. References to childish, silly, weird, etc. - none/beginning/throughout/end

2. Positive attitude expressed - none/beginning/throughout/end
3. Writing about: (place a check mark in appropriate box)

- current life (activities, problems)
- the drawing activity
- object seen in the drawing
- meaning found in the drawing
- response to prompt
- beyond the prompt

F. Did the engagement with and/or qualities of the writing change within the sample?

1. yes or no?
2. How did the writing change?
3. When did the writing change?

G. What is your overall sense of the creativity and self-expression in this folder?

1. Draw to Learn stimulated creativity in the form of Drawing ................. SD D N A SA
2. Draw to Learn stimulated thinking ...... SD D N A SA
3. Draw to Learn generated the expression of thinking in the form of writing ...... SD D N A SA
4. Draw to learn increased self-expression through a) drawing ................. SD D N A SA
   b) writing ................. SD D N A SA

5. Comments
DEFINITIONS: (Used as a reference for the judges; see Section 1.4, p. 15.)

Creativity, according to Frank Barron (1969, in Davis, 1986), "may be defined quite simply as the ability to bring something new into existence." This definition is congruent with entries in the Websters Third New International Dictionary (1987) and the Oxford English Dictionary (date). The root word, "create," which means "to bring into being, to cause to exist, to produce," was adapted from the Latin by Chaucer in the 14th century. The word "creativity," meaning "the quality of being creative or the ability to create," did not enter the English language until the 1870s (OED).

While there is general agreement that all people possess creativity as an "ability to create," society's demand is for people who demonstrate the "quality of being creative." In other words, it is active creativity that is sought and valued. This active creativity generates products which have many incarnations. Dictionary definitions of "create" include examples of product categories. Divine beings create something from nothing, humans create laws, roles, social positions, theories, ideas, things, events, etc. (OED). The results of creativity in action can, therefore, be concrete or abstract.

The active definition of creativity, i.e., "the quality of being creative," is used in this study. With active creativity, several components work together. Mel Rhodes (1961) described these components of active creativity as "person, press, process, and product." The person (who is creative) responds to the press (external stimulus), with a process (action) that culminates in a product (idea, item, event).

These Four "P's" are inherent in the drawing and writing program, called "Draw to Learn," which will be used in this study. The person will be the student, who possesses creativity (and self-expressiveness), plus certain kinds of knowledge and skills. The press will be a complex meld of student interest and motivation, classroom instruction and activities, homework assignments, the school and classroom environments, the regular teacher and the "Draw to Learn" instructor, and the assessment strategies. The process will be the "Draw to Learn" intervention in the classroom and the attendant data collection and analysis. The product will consist of student "Draw to Learn" journal entries and the results of the study.

Self-expression: In addition to increasing creativity, this study also intends to enhance self-expression through drawing and writing. Creativity is manifested through a person's self-expression. As an act, self-expression is a process, and it is one in which an individual conveys information about him- or herself to others. That information in turn is the product component of the procedure. Press, internal or external, gets self-expression started. Self-expression is an intrinsic feature of active creativity. Self-expression is the vehicle whereby creativity is externalized and communicated to others.
Self-expression is built into the Foundation component of SCANS mentioned on page 6. The Basic Skill of communication that is in the Foundation component will develop means of self-expression which in turn will enable individuals to manifest their own traits and personality through the other Foundation Skills of Personal Qualities and Thinking Skills. Self-expressive abilities are in demand in the workplace because employees need to be able to convey ideas, explain procedures, and describe goods and services as they meet continuous calls for new and/or improved processes and products.

The activities proposed by Resnick and Tucker's New Standards Project (see page 6) for content delivery and assessment also embody self-expression. Executing performance tasks, planning and carrying out projects, and maintaining portfolios all require students to reveal their own personalities and traits through individual and divergent responses. This self-expressive approach to learning contrasts sharply with traditional educational strategies that concentrate on memorization and rote recitation of general, impersonal, and convergent data.

The "explicit means" of self-expression in this study will be the drawing and writing activities, the classroom discussions, and the student self-reports.


"The theoretical framework of creativity presented in the following chapter is based in a conceptual definition of creativity that comprises two essential elements:

A product or response will be judged as creative to the extent that (a) it is both a novel and appropriate, useful, correct or valuable response to the task at hand, and (b) the task is heuristic rather than algorithmic." (p. 33)
Thank you for participating in the Draw to Learn Project!

This survey is the final component of that project, and its purpose is to learn about your reactions to your Creative Journal.

I will collect and compile the information from this survey and I will use it in the research for my doctoral dissertation at the University of Massachusetts. Your anonymity in this survey and in all other aspects of this project will be strictly observed.

Your task is to indicate to extent to which you agree or disagree with the following statements. There are five possible responses: STRONGLY DISAGREE (SD), DISAGREE (D), NEUTRAL or UNDECIDED (N), AGREE (A), and STRONGLY AGREE (SA). Show your response to each comment by circling one of the five choices to the right of each statement. There are no RIGHT or WRONG responses. The BEST answers will be the ones that truly reflect your opinions.

And, again, thank you for working with me. You will receive a report when the whole project is completed.

Sincerely,

Louise Loomis, Doctoral Candidate
School of Education
Dept. of Creative Education/Human Services
University of Massachusetts Amherst
OPINION SURVEY for the CREATIVE JOURNAL ACTIVITY in the
DRAW TO LEARN PROJECT

1. Drawing is an enjoyable activity. SD D N A SA
2. I find I get ideas while I am drawing. SD D N A SA
3. I feel I should be doing something more useful when I am drawing. SD D N A SA
4. My pictures often surprise me. SD D N A SA
5. I am never satisfied with my work. SD D N A SA
6. I can tell when I am finished. SD D N A SA
7. I enjoy showing my drawing to others. SD D N A SA
8. I keep thinking I should do a better job. SD D N A SA
9. Drawing can stimulate me to write. SD D N A SA
10. I like to go back the next time and continue on the same drawing. SD D N A SA
11. I feel silly when I am doing my creative journal. SD D N A SA
12. I am really pleased with some of my drawings. SD D N A SA
13. I get totally absorbed when I am doing my creative journal. SD D N A SA
14. I feel like the drawings have to have meanings while I am doing them. SD D N A SA
15. It is easier for me to write when I do the drawing first. SD D N A SA
16. The creative journal helps me think about my life. SD D N A SA
17. I feel I am a person who can draw. SD D N A SA
18. When I draw, I get the urge to write. SD D N A SA
19. My drawings help my memory. SD D N A SA
20. I liked the Draw to Learn Project. SD D N A SA
21. The project helped me with writing.
22. I am a creative person.
23. The creative journal helps me solve some of my problems.
24. I can express my ideas in writing.
25. Everyone should do Draw to Learn.
26. I plan to continue with my creative journal.
27. I have told other people about this project.
28. Draw to Learn helps me to learn.
29. Drawing helps me to think.
30. I will use Draw to Learn in other classes.
APPENDIX D

QUALITATIVE RESCORE
Student Responses to RESCORE (comments and check list)

Has Your Writing Changed?

I wrote a little bit more each time
I used nouns
Verbs, nouns
More words, clauses
I wrote more in the first one
I write more
By elaborating on my story and my shapes/lines
I wrote more
It hasn't really change, it's just that I didn't have much to say in
my last writing
I wrote lest after nouns and verbs
I wrote less
Less, more pronouns
I used less of almost everything. My writing became more work instead
of being fun. I used more harsh words at the end.

Do You Think That Drawing Has Helped Your Writing? How?

No, not really
Yes, because you have something specific to write about

If drawing has helped you write, how has it helped? (Circle the words
in the following list that apply)

Check List Provided on the RESCORE Form
(Number of responses is shown on the left of each option)

(6) 1. I get more ideas       (1) 6. My writing is more organized
(2) 2. It is easier to write    (1) 7. It makes writing interesting
(5) 3. I get new ideas          (6) 8. Working with colors is fun
(4) 4. It brings back memories (2) 9. I don't worry about mistakes
(3) 5. I put in more details     (0) 10. I write more
Has your drawing changed since the beginning of the experiment? How?

I do different color whereas in the beginning I used the same color
I thought of many designs. It made me think of other things
It has changed because I used more colors than.
I have wanted more details and more color
Can create more things
I didn’t keep drawing the same picture
The more you draw, the more you have something to write about
The more colors that I use
In a way, yes, in a way, no
More concrete, deep, solid message
It’s more abstract
I have used less objects and more shadowing
It relaxed my mind
It became more organized and simple
My drawing has moved from scribble lines to faces
APPENDIX E

CONSENSUAL ASSESSMENT CRITERIA
The following criteria functioned as operational standards for the judges as they analyzed 20 of the Creative Journals produced by students in the "Draw to Learn" intervention. These criteria are part of the "consensual assessment technique" developed by Teresa Amabile in her study of the role of motivation in creativity (1983).

(a) **appropriateness of observers.** Judges were informed that they did not need to be experienced in "Draw to Learn" in order to do a good job, but that their overall familiarity with creativity and drawing made them suitable for the task.

(b) **independence of observers.** Judges were advised to refrain from commenting on or discussing students' work during the evaluation session.

(c) **products evaluated in relationship to each other.** Judges were made aware that they were not to base their evaluations on some external criteria of skill, but rather on the ranges they observed within each journal.

(d) **products observed by judges in different random order.** Judges were told that the journals were numbered in sequence for convenience in data collection, but that they were to work with whatever journal was at hand to foster a random order of analysis.

(e) **judges' work is analyzed for reliability.** ANOVA for Single Variance was used to determine degree of interjudge agreement.
In addition, the overall design of "Draw to Learn" met two other Amabile criteria: that analysis be based on product rather than producer and that tasks be open-ended or divergent.

Many of the descriptive terms from Amabile's work were incorporated into the Student Journal Analysis Sheet (SJAS) which the researcher created to assist the judges in their deliberations (see Appendix B).
APPENDIX F

PERMISSION FORMS AND CORRESPONDENCE
Dear Parent,

My name is LOUISE LOOMIS. I am a student at the University of Massachusetts and I am doing a research project at Weaver High School. I am excited by the project, because it brings me back to Weaver, where I taught for many years in the '70s and '80s.

I am writing to ask you to permit your child to participate in the research project in M's English Class.

The purpose of the research is to see if drawing activities will help students with their thinking and their writing. Drawing helps younger children learn and lots of people think drawing can help everyone.

I will make eight visits to your child's English class during a period of 6 to 8 weeks. During the first and last visits, your child will take a short (30 minutes) test that measures creative thinking and that consists of several drawing activities. The remaining six visits will consist of a drawing/writing program called "Draw to Learn." This program is designed to fit into your child's lessons so it does not interfere with regular instruction.

At the end of the program, your child will analyze his/her writing, and will answer a questionnaire telling me his/her opinion of the project.

I will use the results of the research to complete my dissertation for a Doctor of Education. I will make the results available to your child, to you, and to any one else who is interested.

Your child will not be identified in any way in the results. Each child will be given a number, and I will keep the records private. Furthermore, your child does not have to participate in this project, and may withdraw from it at any time.

"Draw to Learn" is enjoyable, and it has already helped many people. I hope you will permit your child to participate by signing the attached permission slip.

Please call me if you have any questions. My telephone is listed below my name at the end of this letter.

Sincerely,

Louise Loomis
233-8650
Dear Louise,

I understand the description of your "Draw to Learn" research project, and I give permission for my child to take part in the project as part of his/her work in M _________'s English Class.

Signed,

My child's name is ____________________.
Dear Student,

My name is LOUISE LOOMIS. I am a student at the University of Massachusetts and I am doing a research project at Weaver High School. I am excited by the project, because it brings me back to Weaver, where I taught for many years in the '70s and '80s.

I am writing to ask you to agree to participate in the research project in M's English Class.

The purpose of the research is to see if drawing activities will help students with their thinking and their writing. Drawing helps younger children learn and lots of people think drawing can help everyone.

I will make eight visits to your English class during a period of 6 to 8 weeks. During the first and last visits, you will take a short (30 minutes) test that measures creative thinking and that consists of several drawing activities. The remaining six visits will consist of a drawing/writing program called "Draw to Learn." This program is designed to fit into your lessons so it does not interfere with regular instruction.

At the end of the program, you will be asked to analyze your writing using a special and easy method, and you will be asked to answer a questionnaire telling me your opinion of the project.

I will use the results of the research to complete my dissertation for a Doctor of Education. I will make the results available to you, and to any one else who is interested.

You will not be identified in any way in the results. Each participants will be given a number, and I will keep the records private. Furthermore, you do not have to participate in this project, and you may withdraw from it at any time.

"Draw to Learn" is enjoyable, and it has already helped many people. I hope you will participate by signing the attached agreement slip.

Please call me if you have any questions. My telephone is listed below my name at the end of this letter.

Sincerely,

Louise Loomis
233-8650
"Draw to Learn" Research Project  
Louise Loomis, Candidate for Doctor of Education  
University of Massachusetts

Dear Louise,

I understand the description of your "Draw to Learn" research project, and I agree to take part in the project as part of my work in Ms. ____________'s English Class.

Signed,

__________________________
Dr. E. Davis, Principal  
Weaver High School  
415 Granby Street  
Hartford, CT 06112  
1/24/93

Dear Dr. Davis,

I am writing to ask you for official permission to carry out the research component of my doctoral studies at Weaver High School.

The first chapter of my proposal is enclosed to give you an overview of my project. I have an appointment scheduled with you for February 2nd at 11:00 a.m. to go over the planned intervention.

Three teachers have indicated interest and willingness to participate in the project: Daisy Cameron, Dianna Sorrajja, and Audrey Garvey. I have their verbal commitment, and, pending your approval, will proceed to formalize arrangements with them. I realize, also, that permissions from the students and the superintendent are required.

Since the experiment is intended to enhance students' productivity in writing, its implementation should not detract from their studies . . . and hopefully will improve their performances in measurable amounts.

The whole project is in a juggling pattern at the moment, and is very flexible. It will be easy to adapt to your ideas and suggestions.

I am looking forward to meeting with you on February 2 and I hope you will find my study interesting and worthwhile.

Sincerely,
Ms. Diana Sorraja  
Weaver High School  
415 Granby Street  
Hartford, CT 06112  

Dear Diana,

Thank you ever so much for your interest in my research project. I have a meeting with Eddie Davis scheduled for February 2 to begin to get the official stuff under way. Could I meet with you that day also? I know we had mentioned the 29th (this Friday), but I now have to go to UMass to get further approvals and planning under way for their side of the situation. Two of my committee members are on sabbatical and will not be readily available in February/March.

Please let me know about the 2nd. My telephone # is 233-8650, and is on a machine, so you can leave a message informing me when to come, etc. I’d also like to take you, and the other two teachers who’ve agreed to participate in the project, out for a dinner and explain the whole thing more thoroughly . . . plus have some good teacher chat. What are good times for you after school? Hopefully we can do it all at the same time. If not, we’ll do at each person’s convenience.

With mucho appreciation and looking forward to hearing from you,

Fondly,
Eddie Davis, Principal  
Weaver High School, 415 Granby Street  
Hartford, CT 06112  

Dear Dr. Davis,

Thank you for your letter approving my plans for a research project in language arts at Weaver High School.

Since speaking with you, the following has occurred:

1. Tom Smith has joined the project, so there are now four teachers involved. I hope you approve of this addition.

2. I have submitted my proposal to the Department of Evaluation/Research/Testing. Dr. Nearine asked for additional material, which I provided and the proposal is now circulating among supervisory staff. Dr. Nearine is concerned about the amount of time that the project is planned to take, and also the time of year. I hope I will be able to negotiate, and obtain approval. I imagine it will take another week before I have final word.

Meanwhile, I am continuing to be hopeful. I am writing the teachers today to inform them of the situation. They are Daisy Cameron, Audrey Garvey, Thomas Smith, and Diana Sorrajja.

It seems to me that the spring of the year is a fine time for trying out something new! I will let everyone at Weaver know about the project. Also, is there anyone at Weaver in Language Arts with whom I should have spoken?

Thank you for your interest and support.

Sincerely,

Louise Loomis

Enclosures: letters to teachers (4)
Audrey Garvey  
Weaver High School  
415 Granby Street  
Hartford, CT 06112  
3/1/93

Dear Audrey,

This note is to bring you up to date with the "Draw to Learn" research project. I am awaiting word from downtown: Dr. Nearine of the Department of Evaluation/Research/Testing is circulating my proposal among the appropriate decision makers and I am anxiously awaiting their decisions. As soon as I get word, I will let you know.

If the word is yes, then I’ll need a brief meeting with you to set up scheduling, finalize the permission slips (I’ve written them, but need your input). In addition, I would like to use your group as a control. This means we wouldn’t do the actual "Draw to Learn" part until after I’ve finished it with the other group. However, I can schedule it over a shorter period of time . . . so if all goes well, your students will get the same material.

I hope to get in touch with you within the next week to ten days. I am really excited at the prospect of the project, and of working with you. Therefore I am currently in a state of considerable anxiety!!!

Fondly,

Lou Loomis

c.c.: E. Davis
Diana Sorrajja  
Weaver High School  
415 Granby Street  
Hartford, CT 06112  

3/1/93

Dear Diana,

This note is to bring you up to date with the "Draw to Learn" research project. I am awaiting word from downtown: Dr. Nearine of the Department of Evaluation/Research/Testing is circulating my proposal among the appropriate decision makers and I am anxiously awaiting their decisions. As soon as I get word, I will let you know.

If the word is yes, then I’ll need a brief meeting with you to set up scheduling, finalize the permission slips (I’ve written them, but need your input). In addition, I would like to use half your group as a control. This means we wouldn’t do the actual "Draw to Learn" part for them until after I’ve finished it with the other half. However, I can schedule it over a shorter period of time . . . so if all goes well, your students will get the same material.

I hope to get in touch with you within the next week to ten days. I am really excited at the prospect of the project, and of working with you. Therefore I am currently in a state of considerable anxiety!!!

Fondly,

Lou Loomis

c.c.: E. Davis
Thomas Smith  
Weaver High School  
415 Granby Street  
Hartford, CT 06112  
233-8966/8650  

3/1/93

Dear Tom,

This note is to bring you up to date with the "Draw to Learn" research project. I am awaiting word from downtown: Dr. Nearine of the Department of Evaluation/Research/Testing is circulating my proposal among the appropriate decision makers and I am anxiously awaiting their decisions. As soon as I get word, I will let you know.

If the word is yes, then I’ll need a brief meeting with you to set up scheduling, finalize the permission slips (I’ve written them, but need your input). In addition, I would like to use one of your classes as a control. This means we wouldn’t do the actual "Draw to Learn" part for them until after I’ve finished it with the other class. However, I can schedule it over a shorter period of time . . . so if all goes well, your students will get the same material.

I hope to get in touch with you within the next week to ten days. I am really excited at the prospect of the project, and of working with you. Therefore I am currently in a state of considerable anxiety!!!

Fondly,

Lou Loomis

C.C.: E. Davis
GUIDELINES FOR RESEARCH IN HARTFORD

- Requirements and Considerations -

Background

Although Hartford is a small urban community, as Connecticut’s capital city with a national reputation for innovative educational programs, it is an optimal site for research. Hartford’s manageable size, its diversified population, and close proximity to a large number of colleges and universities are also attractive features.

While the Hartford Public Schools encourage relevant research, the fact that the City is an optimal study site presents a number of administrative and procedural problems: Hartford is often included in national and regional high priority studies and constantly receives requests which range from well thought out study plans to informal requests for information. In order to handle these requests, a central clearance procedure for all testing, research, and other investigations has been established.

Potential Problems

A study request will often reveal potential problems; the study plan may be incomplete, the researchers may have less than an acceptable level of professional competence, and the study may require student, staff, and administrative time or the use of other valuable resources. The study may also create logistical problems, although these can often be overcome. In consequence, all study requests are prioritized with two goals in mind: to obtain as much relevant data
as is possible for Hartford while minimizing intrusions to the instructional process.

Guidelines

In order to maximize study benefits and minimize instructional problems, a set of guidelines were developed. These Guidelines cover all studies and requests for study information initiated both by Hartford and non-Hartford staff which take place outside the bounds of a teacher’s individual classroom.

1. Request Referral. All study requests are referred to the Evaluation, Research, and Testing Office (Evaluation). Upon receipt, the researcher is contacted and furnished a copy of these Guidelines.

2. The Proposal. A clear, concise, basic-English proposal describing the study must be submitted to the Evaluation office before any clearance is initiated. This proposal should describe the following:

a. What is being investigated? The writer should identify any benefits, both present and future, which the study may produce for Hartford.

b. How will the study be conducted? Identify the potential study population, grade levels, school locations, numbers of test administrations, length of testing times both for individual youngsters and for classes as a whole, and any specific logistical, administrative, or procedural considerations which will impact on the study. Include copies of all instrumentation.
c. When will the study take place? List proposed dates, times, and alternative schedules in case the primary schedule must be modified. Note that any proposal has a much greater chance of acceptance if it is submitted early in the school year, or at least in time to provide for a great deal of internal coordination. While it is possible to "crank up" a study clearance in less than one week's time, this usually creates a great deal of trouble; hence, it should be avoided.

d. Problem Areas. Possible problem areas should be identified. Suggest how they can be avoided or resolved.

e. General information. Keep the proposal short. While a formal thesis proposal can be submitted as backup, it will not be circulated to other members of staff; because of their length and complexity, these proposals are usually not read. Stick to basic English and in all probability you will receive a response in a few working days. If you submit a technical proposal which may appear obtuse to the non-research practitioner, this will probably delay the receipt of any response. Remember that line administrators are busy operating schools and don't have time to sit down and wade through ponderous documents.

3. Evaluating the Proposal

a. The Evaluation officer will examine each proposal for completeness, technical adequacy, applicability to Hartford's existent problems, and general educational value. Consequently, the researcher who has not done
his/her "homework" can expect a request for further information.

b. A proposal which is written in the form of "I want to do a study" and which needs someone to sit down and help the visiting "scholar" design, orchestrate, and carry out his study will not be encouraged. While these services are provided to Hartford staff members, this office has neither the time nor the staff to provide these services to others; university faculties provide this kind of public assistance.

c. If all necessary questions have been answered and the proposal appears to describe a worthwhile study, annotated copies are circulated to involved administrators within the central office and sometimes to an ad hoc evaluation advisory council for consideration. Staff reactions are generally obtained within 3 to 5 working days.

d. If staff reactions are favorable, prioritize and tentative plans are established and the researcher is notified. Note that priorities reflect the reactions obtained from a number of people who have a potential interest, or involvement in the study. Priorities can be summarized as follows:

- Studies which seem to have system-wide value are encouraged at the assistant superintendent’s level or above, and are implemented by administrative decision.
- If the study seems to have a lesser degree of value, an assistant superintendent may encourage its implementation but may leave the actual decision up to participating school principals, department heads, or other appropriate administrators. At this point, the same proposal is circulated to prospective study sites. Favorable or unfavorable site reactions are then transmitted to the researcher.

- If the study's value is restricted to a single school, specific combination of schools, or a designated program, the assistant superintendent may determine that the study should be implemented or may leave this decision to the discretion of the appropriate administrators. Again, annotated proposals are circulated to the prospective study sites, and reactions are communicated to the researcher.

- If the study has limited value or is intrusive, it usually will not receive central office support and the researcher will be notified that the study has not been encouraged. The Evaluation office may be able to suggest alternate ways in which the study can be completed; on a voluntary basis, after school hours, on a paid basis, or through other agencies in the community.
4. **Implementing the Study.** Once a study priority has been established, appropriate contacts are made by the Evaluation office.

   a. Contacts are usually made by letter, phone, or memo since the researcher is not encouraged initially to sit down and take staff time to discuss a study.

   b. Final logistical arrangements are made for the conduct of the study. These activities are usually completed within one week following the establishment of the recommended priority. The investigator may be asked to set up an appointment at the Evaluation office and work out the specifics of his study. Here, time schedules, modifications to instruments, and other logistical considerations are arranged. Since public school research usually can not be conducted under laboratory conditions, planning trade-offs are often necessary. It is at this point that limited contact with schools or other study sites may be suggested.

   c. If the study is not encouraged, notification is made according to the same time schedule. Incidentally, summer vacation schedules, illnesses and/or other unexpected occurrences may delay a response for up to three weeks. While this is usually the exception it should be considered as part of the researcher's planning.

5. **Monitoring the Study.** A monitoring plan is established in conjunction with the logistical plan. As a minimum, the plan requires that the Evaluation office be kept constantly informed
of study progress, problems, and changes in plans or schedules. If potential problems and/or changes to the study are identified in advance and transmitted to the Evaluation office, these can usually be resolved with no real harm coming to the study. If they are discovered after the fact, a termination of the study could result. The necessity for keeping the Evaluation office informed cannot be overemphasized.

6. Documentation. All studies are encouraged with the following stipulations:

a. All data must be reported anonymously so that the privacy of the participants is respected.

b. A copy of the completed study must be furnished to the Superintendent, through the Evaluation office, prior to any publication or release to the press. This is only courtesy. If necessary the Evaluation office will make arrangements for reproducing the study, for preparing a "basic English" abstract, and for further distribution of study materials to staff.

c. The investigator must be willing to sit down with the staff, the students, and the parents who have been involved in the inquiry to discuss findings, conclusions, and implications. While this can be done in a rather informal setting, it is one way of contributing to the knowledge of the school system. Arrangements will be made through the Evaluation office.

d. Copies of any letters of encouragement, or other appropriate correspondence may be furnished the student's
advisor, or the administrative officer, or agency overseeing the conduct of the study. Here the implication is clear; a failure on the part of the researcher to carry out his responsibilities in a professional manner or to adhere to the agreed upon guidelines will reflect adversely on the sponsoring institution to the point that future studies in Hartford may not be encouraged.

7. **Additional Information.** Information regarding these Guidelines, the present status of studies, or the projected needs of the system can be obtained by calling (203) 722-8591.

Evaluation, Research, & Testing Office

Hartford Public Schools

Board of Education

249 High Street

Hartford, Connecticut 06103

Revised 8/88
Mr. Robert Nearine, Special Assistant
Evaluation, Research & Testing
Hartford Public Schools

Dear Mr. Nearine,

Thank you for your letter of February 22. Enclosed is a study prospectus that I hope will satisfy the conditions you described in that letter. I appreciate your guidance.

Sincerely,

Louise Loomis
STUDY PROSPECTUS FOR "DRAW TO LEARN" DISSERTATION
Presented by
Louise Loomis, doctoral candidate
Graduate Program in Creativity
University of Massachusetts at Amherst

PURPOSE: To determine whether or not an intervention of the "Draw to Learn" program at the secondary level will increase creativity and self-expression in language arts classes.

NEED ADDRESSED: Despite the existence of: (a) proof that drawing is a valuable learning tool at the elementary level, (b) many recommendations for multi-model instruction deriving from brain research and educational psychology and (c) numerous claims that drawing is valuable for learning at the secondary level, this researcher has found no studies attempting to measure the effects of drawing on learning at the secondary level.

This study expects to find an increase in creativity and self-expression among secondary level language arts students after an intervention of six sessions of the "Draw to Learn" program. The study proposes to measure creativity and self-expression with the following procedures.

Quantitative:
- Torrance Test of Creative Thinking (pre/post @ 30 minutes)
- Sheridan RESCORE Instrument for writing (post only: student administered)

Qualitative:
- Student self-report questionnaire (post only: student administered)
- Panel analysis of 20 randomly selected student products (post. No student or classroom time involved.)

METHOD & TIMELINE

"Draw to Learn" is designed to enhance writing in language arts classes. It functions as a pre-writing/writing procedure, linking student knowledge to classroom expectations. In "Draw to Learn" students do simple drawing exercises, reflect on their thinking as they draw, and then write about their drawings and their reflections. The drawing exercises are adapted to whatever course content is being studied at the time of the intervention.

While three of the instruments involve a total of four class periods, each one has potential for benefitting instruction as follows:

1. The RESCORE test involves students in their own performance assessment, and provides opportunities for further language arts experiences as they analyze their writing for parts and figures of speech.

2. Torrance Test will engage the students proactively, as they create pictures and designs, and make up titles and little stories throughout the testing period of 30 minutes.

3. The self-report questionnaire, with its focus on the "Draw to Learn" project will encourage reflection, and will serve as a base for student writing and research. The writing can be a description of the project. The research can involve collecting and analyzing data about the answers just as the researcher will do.

The researcher also believes that the project itself will be of interest to the participants, and will be of educational value as an example of an "authentic" learning experience.

The researcher will need the following classroom time:

A. To explain the project and hand out permission slips (1 visit; 1/2-1 full period)
B. To administer the pre and post Torrance Tests (2 visits: 1 period each)
C. To present the six "Draw to Learn" lessons (6 visits: 1 period each)
D. To assist the teacher in coaching the students as they do the RESCORE test (1 visit: 1 period)
E. To administer the self-report questionnaires, and discuss the experiment (1 visit: 1 period)
F. Only parts A and B of the above will be needed for the control groups (3 visits of 1 period each)

TOTAL CLASSROOM TIME -   Experimental Group: 9 periods, over a span of 7-9 weeks
                              Control Group: 3 periods, over a span of 6-7 weeks

Mr. Eddie Davis has read the research proposal and has given his approval for the project to take place at Weaver High School, subject to final approval by the Department of Evaluation.
Mr. Eddie Davis has read the research proposal and has given his approval for the project to take place at Weaver High School, subject to final approval by the Department of Evaluation, Research and Testing. Four teachers at Weaver have been identified who would like to participate in the project, and who see it as an interesting method for teaching writing in their English classes. Students will participate as classes. Half of the sample will be the Freshman Essential Schools Group, and the other half will be four sections of upperclassmen from regular English classes.
March 25, 1993

Louise Loomis
70 Terry Road
Hartford, Connecticut 06105

Re: UMASS Draw to Learn Study

Dear Ms. Loomis:

I am happy to inform you that both the Assistant Superintendents for School Sites and for Support Programs and Services have encouraged the cited study. This encouragement is given with the following stipulations:

1. That the Guidelines for Research in Hartford will apply to the conduct of this study. Note particularly the requirement that all data be presented anonymously, that a copy of the final report be furnished to the Superintendent through this office prior to any publication or dissemination, and that the researcher stand willing to discuss study findings and implications with appropriate members of staff.

2. Encouragement is contingent on the approval and willingness of the Weaver School Principal, the members of his staff, and selected students to participate in the study. Note that this participation by any of the participants can be terminated at any point in time.

3. Evaluation Office staff are concerned about the amount of time which will be taken away from the regular English/Language Arts instructional process. They feel that the Weaver staff is in the best position to determine whether or not the study is relevant, and whether the information which will be provided will fully compensate for the instructional time which is involved. While the study can be encouraged, participation must be approved at the school level.

4. Since the study represents a change in the instructional process, the principal can determine whether or not parental permission is needed. If required by the principal, permission letters should be cleared with the Evaluation Office in advance of any study activities.

5. Finally, because of end-of-year close out activities, all study activities involving students and staff must be completed no later than June 1, 1993.

Best of luck to you with your study. As your inquiry progresses, please continue to keep us informed. By the same token, if your plans or schedules change, again, a call to this office would be appreciated.

Very sincerely yours,

Robert J. Nearine
Special Assistant
Evaluation, Research, and Testing

RJN/ac
enc: Guidelines and Abstract
March 31, 1993

Robert J. Nearine, Special Assistant
Evaluation, Research & Testing
Hartford Public Schools

Dear Dr. Nearine,

Thank you for the good news that the plans for my study have been approved. I accept the conditions. They are consistent with both the research requirements of the University of Massachusetts and with my personal values and beliefs about the instructional process.

Dr. Davis has given me written approval for the study, three of the four teachers who originally indicated interest are looking forward to the project, I am orienting their classes today and tomorrow, and I expect to start the intervention right after Spring Vacation.

I am using permission slips as they required by the University.

If necessary, I will shorten the intervention period in order to complete the study by June 1, 1993.

I appreciate your interest and encouragement, and the support of all those who read and approved my proposal.

Sincerely,

Louise Loomis

cc: E. Davis
Intervention Session Descriptions

Class time at Weaver H.S. is 42 minutes. This was not adequate for the complete drawing/writing activity.

During the week of 5/21, students took two sets of standardized tests. They did not want to write in Session VI, nor were they receptive to the TTCT post-test.

Session I - April 19

Broad tip colored markers, folders, and paper distributed.
Decoration of folders encouraged.
Doodle drawing explained.

FIRST DOODLE DRAWING

WRITING PROMPT: 1. How I feel about this activity
2. What I am thinking about while I am doing this activity
3. What my picture tells me

Session II - April 23

Materials distributed (including markers in 9th grade classes. Older two groups [Garvey & Smith] were responsible for their markers.)

SECOND DOODLE DRAWING

WRITING PROMPT: 1. How I feel about this activity
2. What I am thinking about while I am doing this activity
3. What my picture tells me
4. How my second picture differs from my first picture

Session III - April 27

Materials distributed (GARVEY group withdrew after Session II)
Lateral dominance information cum diagram of hemispheric preferences distributed

THIRD DOODLE DRAWING: Done with non-dominant hand

WRITING PROMPT: 1. How it feels to work with the non-dominant hand
Session IV

Materials distributed. Thinking Center brochure distributed & discussed

Terms re drawings brainstormed and written on newsprint

WRITING PROMPT: A. Look at three pictures you have drawn:

1. When I look at ... (memory)
2. Picture 1, 2, and/or 3 reminds me of...

FOURTH DOODLE DRAWING: All started with zig-zag line, & two of three classes drew to music (Kitaro)

WRITING PROMPT: B. 1. This experiment is...
   in picture 4...
   2. My lines are...
   3. My shapes are...
   4. My colors are...

Session V

Materials distributed

Display of contemporary, non-objective art reproductions explained & discussed

FIFTH DOODLE DRAWING USING prepared handout for drawing and writing distributed (attached)

Session VI

Materials distributed

FINAL DOODLE DRAWING using prepared handout (attached)
Session 5 - May 14, 1993

1. Please create a "doodle" picture.
   a. Use either hand and start any way you wish.
   b. Notice your thoughts while you are drawing. Are you making up rules? Are you thinking about friends, classes, home, this weekend, work, family, etc.?
   c. Record your thoughts.
   d. Describe your picture, using words from the word bank and any other words you wish.

2. Please look at your other pictures.
   a. Number them in the order in which you drew them.
   b. Pick one picture to study.
   c. Write down memories of the day you drew that picture.
      i. what happened that day?
      ii. how you felt
      iii. what you were thinking about
   d. List some things the picture reminds you of.
   e. Make a story about the picture.
WEAVER HIGH SCHOOL

Draw to Learn Project
L. Loomis, Instructor

Session 6 - May 21, 1993

TODAY IS THE LAST DAY OF THE DRAWING/WRITING ACTIVITY

NEXT WEEK WE WILL DO THE POST TESTS to see if anything happened

I will visit your class twice.

Visit 1: To do a test similar to the one you did at the beginning

Visit : To do a "feedback" questionnaire, and a student writing analysis.

TODAY PLEASE DO THE FOLLOWING:

1. Make any kind of picture you wish.

2. Pay attention to your mind while you are making the picture. (suggestions...think about yesterday, today, tomorrow, your goals, your worries, what makes you happy. Anything you wish. ALSO: note if you and your mind are making up rules about the picture, and if the picture gets to have something in it, or a meaning, or a story)

3. Write what went on in your head.

4. Describe your picture...kinds of lines and shapes, colors and sizes, etc.

5. Describe what you see in your picture and what it reminds you of.

6. Use the picture to write a little story or description.

7. DO PARTS 2, 3, 4, 5, & 6 in any order you wish.

THANK YOU!
APPENDIX H

GRAPHIC SUMMARIES OF OPINION SURVEY RESPONSES
1. Drawing is an enjoyable activity

2. I feel I should do something more useful when I am drawing

3. I am really pleased with some of my drawings

4. My pictures often surprise me

5. I never feel I have done my creative journal

6. I can tell when I am finished

7. I keep thinking I should do a better job

8. I feel silly when doing my creative journal

9. I enjoy going back next time and continue on the same drawing

10. I feel like the drawings have to have meanings

11. I like to go back next time and continue on the same drawing

12. I am really pleased with some of my drawings

13. I get totally absorbed when doing my creative journal
9. Drawing can stimulate me to write
15. It is easier for me to write when I do the drawing first
21. The project helped me with writing

2. Attitudes about the relationship between the drawing & writing parts of the intervention

18. When I draw I get the urge to write

3. Opinions of the "Draw to Learn" intervention (with a positive attitude invited)

20. I liked the "Draw to Learn" project
25. Everyone should do "Draw to Learn"
27. I have told other people about this project

26. I plan to continue with my Creative Journal
30. I will use "Draw to Learn" in other classes
7. I enjoy showing my drawing to others
2. I find I get ideas while I am drawing.

23. The Creative Journal helps me solve some of my problems.

29. Drawing helps me think.

19. My drawings help my memory.

16. The Creative Journal helps me think about my life.

28. "Draw to Learn" helps me to learn.

24. I can express my ideas in writing.

17. I feel I am a person who can draw.

22. I am a creative person.

5 Images of self as writer, drawer, and creative person.

4 Perceptions of the cognitive dimensions of "Draw to Learn".
APPENDIX I

PERCENTAGE ANALYSES OF OPINION SURVEY RESPONSES
## PERCENTAGE ANALYSES OF OPINION SURVEY QUESTIONNAIRE

**Percentage of Respondents/Response**

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APPENDIX J

OPINION SURVEY RESULTS
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APPENDIX K

SUMMARY OF RESPONSES TO C, E, AND F ON SJAS
Judges’ Comments

Each judge is identified by the color of paper used for her SJAS. COM is an abbreviation for “comment,” which was the last question on the SJAS (G5). C, E, F, refer to the question on the SJAS as follows:

C. Did the engagement with and/or qualities of the drawing change within the sample?
1. yes or no
2. how did the drawings change?
3. when did the drawings change?

E. Qualities of the writing
1. References to childish, silly, weird, etc. - none/beginning/throughout/end
2. Positive attitude expressed - none/beginning/throughout/end

F. Did the engagement with and/or qualities of the writing change within the sample?
1. yes or no
2. how did the writing change?
3. when did the writing change?

G5. Comments:

<table>
<thead>
<tr>
<th>Journal 1</th>
<th>Orange</th>
<th>Yellow</th>
<th>Peach</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.1. Yes</td>
<td>C.1. No</td>
<td>C.1. Yes</td>
<td>2. Not much change, but seemed to represent affect</td>
</tr>
<tr>
<td>2. 2nd drawing more vivid/ organic/flowing</td>
<td>4th drawing - more complex, less command</td>
<td>3. Each time</td>
<td></td>
</tr>
<tr>
<td>3. Each session</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E.1. none</td>
<td>E.1. NA</td>
<td>E.1. NA</td>
<td></td>
</tr>
<tr>
<td>2. Throughout</td>
<td>2. Throughout</td>
<td>2. Throughout</td>
<td></td>
</tr>
<tr>
<td>F.1. Yes</td>
<td>F.1. NA</td>
<td>F.1. Yes</td>
<td></td>
</tr>
<tr>
<td>2. Less content/response to prompt each time, but the writing became more decorative/colorful</td>
<td>2. NA</td>
<td>2. Content didn’t change much but much change in use of colors &amp; graphics in writing</td>
<td></td>
</tr>
<tr>
<td>3. The 2nd exercise = writing most decorative. The 4th drawing = less &quot;designer,&quot; more simple than #2</td>
<td>2. NA</td>
<td>3. Steady change</td>
<td></td>
</tr>
</tbody>
</table>

COM: What’s tricky about this one is that the student begins to express a color and design sense through the graphics of writing, rather than write about her thinking. The cover of her folder is also artful writing.
Journal 2

Orange

C.1. Yes
2. #3 is tighter
   #4 has a narrowed, intense
   #5 is loose, energetic
3. included with 2.

E.1. None
2. Throughout

F.1. Yes
2. In the middle = more about
   personal life/symbolic
   meaning. Deeper on #4.
   #5 is superficial
3. Included with 2.

COM: Student went deeper,
freer. Last one = back to
conventional written response
and to Easter colors

Yellow

C.1. NA
2. NA

E.1. NA
2. beginning, end

F.1. Yes
2. Less
3. At 4th writing

COM: So little writing;
hard to judge - I guess
generating some similes
is stimulation of thinking
skills

Peach

C.1. Yes
2. More complex, more
   commanding
3. Steady, incremental
   increases

E.1. None
2. Throughout

F.1. Yes
2. A little more info with
   each session (due to
   increased prompts) than
   at the end.
3. Included with 2.

COM: Interesting as drawings
"increased," writing dropped
off at the end

Journal 3

Orange

C.1. Yes
2. At #5 became (it seems)
   more idiosyncratic, indivi-
   dually expressive, quirky
3. Last two sessions

E.1. None
2. Throughout

F.1. Yes
2. Little more emphasis on
   content of drawing in
   #5 + #6
3. At #5

COM: Drawing seemed to become
more individual, less stereo-
typed writing became slightly
more thoughtful

Yellow

C.1. Yes
2. Became freer, more
   round, organic

E.1. None
2. Throughout

F.1. No
2. NA
3. After the 1st

COM: So little writing;
hard to judge - I guess
generating some similes
is stimulation of thinking
skills

Peach

C.1. Yes
2. Steady increments
   overall more expressive
   as sessions happened
3. Included with 2.

E.1. None
2. Throughout

F.1. Yes
2. More info in response to
   prompts then seemed to
   just want to get it done
   sessions progressed
3. Each time in response to
   prompts

COM: Interesting change in
drawings as if "playing" with
shapes & colors. Although
writing "ratings" don't reflect
this person's self-esteem
seems to have (up arrow)
Orange
C.1. Yes
2. More experimentation, risk-taking, daring, personal expression, intensity
3. Throughout. Big leap at #4 to #5 to #6: towards risk, engagement, intensity. #3 looks "shaky" - left-hand - but dynamic.

E.1. None
2. Throughout "especially at end"

F.1. Yes
2. More was revealed - more reflection, more pleasure - towards meaning

COM: Dramatic, strongly articulated change Exciting!

Yellow
C.1. Yes
2. From free and abstract to lighter, w/repres. (illegible)
3. NA

E.1. "Negative attitude to book"
2. (Illegible comment)

F.1. No. "Stayed brief, minimal"
2. NA

COM: The person seemed to "take off," produced some "creative" drawings, then seemed to drop back. Drawing & writing

Peach
C.1. Yes
2. Seemed to become more complex, artistic & then changed to more simplistic pictures
3. (arrow up) session 3 (arrow down) session 5

E.1. Beginning
2. Throughout

F.1. Yes
2. Content a little more focused as time went on - writing itself (penmanship) vastly improved thing as drawing: (arrow up) then (arrow down)
3. A small increase, session 3, or status quo to all then (arrow down)
Journal 5

Orange

C.1. Yes
2. Drawing #4 was the 1st representational drawing, seemed more organized/focused/expressive, as was the last drawing
3. The last 3 drawings seemed more selective in terms of use of space/organization

E.1. "all but the last"
2. End

F.1. Yes
2. A little more emotional content & variety of this content starting with #3, lost on #6, also #4 included more commentary on design. #6 - back to "getting it done."
3. Included in 2.

COM: Drawings did become more representational and seemed to have more emotional content, were more thoughtfully organized/arranged. Writing became more thoughtful for #s 3 & 4 in spite of itself. Fear of engagement?

Yellow

C.1. Yes
2. From disorganized to more organized to chaotic to representational & graphically strong
3. Throughout

E.1. Beginning, Throughout, End
2. End

F.1. No
2. NA

COM: The kid started to draw himself - see the sample before this - the move from abstract doodle to disturbed self-portrait in the (illegible)

Peach

C.1. Yes
2. Increases in engagement & emotional content
3. Steadily increased, session by session - great final fall

E.1. Throughout
2. None

F.1. No
2. NA

COM: Person seems to have a lot of emotion being held in - needs form of expression
<table>
<thead>
<tr>
<th><strong>Journal 6</strong></th>
<th><strong>Orange</strong></th>
<th><strong>Yellow</strong></th>
<th><strong>Peach</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>C.1. Yes</td>
<td>C.1. Yes</td>
<td>C.1. Yes</td>
<td></td>
</tr>
<tr>
<td>2. Expression intensifies, then loses energy at #4, with a lot of wildness at #5, some conventionality but diversity, but more loss of personal energy in #6.</td>
<td>2. Got less original and engaged</td>
<td>2. Seemed to increasingly reflect more affect/emotional content, then dropped off at end</td>
<td></td>
</tr>
<tr>
<td>3. Included in 2.</td>
<td>3. At #4</td>
<td>3. Increases from sessions 1-5 then drop off</td>
<td></td>
</tr>
<tr>
<td>E.1. #s 2, 3, 5 = &quot;silly, childlike&quot; #s 4, 5 = &quot;wild, crazy&quot; #6 = freaky</td>
<td>E.1. &quot;silly&quot; beginning, end</td>
<td>E.1. None</td>
<td></td>
</tr>
<tr>
<td>2. Beginning</td>
<td>2. Beginning</td>
<td>2. Throughout</td>
<td></td>
</tr>
<tr>
<td>F.1. Yes</td>
<td>F.1. Yes</td>
<td>F.1. No(?)</td>
<td></td>
</tr>
<tr>
<td>2. about creativity &amp; personal thought, symbolism drawing to how I feel about this drawing business. Silly childlike to wild crazy.</td>
<td>2. Less engaged</td>
<td>2. Largely reflected response to prompts but did go beyond prompt - seemed to concentrate on emotional states.</td>
<td></td>
</tr>
<tr>
<td>3. Included in 2.</td>
<td>3. At drawing #3</td>
<td>3. Steady</td>
<td></td>
</tr>
<tr>
<td>COM: Again, this almost looks like fear of the intensity and a move to forms more emotional than at 1st.</td>
<td>COM: Were sample #1 &amp; #6 near each other?</td>
<td>COM: Drawings seemed to provide focus for thinking about emotions - way to integrate past &amp; present.</td>
<td></td>
</tr>
<tr>
<td>Journal 7</td>
<td>Orange</td>
<td>Yellow</td>
<td>Peach</td>
</tr>
<tr>
<td>----------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>C.1. Yes</td>
<td>C.1. Yes</td>
<td>C.1. Yes</td>
<td></td>
</tr>
<tr>
<td>2. #5 is figurative/intense</td>
<td>2. From organic to</td>
<td>2. Very different change in</td>
<td></td>
</tr>
<tr>
<td>emotionaly expressive/</td>
<td>representational/</td>
<td>session 5 from abstract</td>
<td></td>
</tr>
<tr>
<td>elegant/quirky/ design is</td>
<td>symbolic to geometric</td>
<td>to representational - also</td>
<td></td>
</tr>
<tr>
<td>reserved &amp; impact is</td>
<td>angular, mountainlike</td>
<td>change from session 5 to</td>
<td></td>
</tr>
<tr>
<td>powerful. #6 is then</td>
<td>forms</td>
<td>6 - from curves &amp; loops</td>
<td></td>
</tr>
<tr>
<td>different again from all</td>
<td></td>
<td>to straight lines and</td>
<td></td>
</tr>
<tr>
<td>the others - more geometric,</td>
<td></td>
<td>peaks</td>
<td></td>
</tr>
<tr>
<td>elegantly reserved, expressive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Included in 2.</td>
<td>3. Included in 2</td>
<td>3. Included in 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. End #2 - #6</td>
<td>2. End</td>
<td>2. None</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F.1. Yes</td>
<td>F.1. Yes</td>
<td>F.1. Not much</td>
<td></td>
</tr>
<tr>
<td>2. Comment on art, activity,</td>
<td>2. Less of it</td>
<td>2. Writing didn’t seem to</td>
<td></td>
</tr>
<tr>
<td>self-doubt to less self-</td>
<td></td>
<td>progress much beyond the</td>
<td></td>
</tr>
<tr>
<td>doubt, interest in content</td>
<td></td>
<td>prompts</td>
<td></td>
</tr>
<tr>
<td>of drawing to reference</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>to life activities, life</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>content to comment on art</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>activity only</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM: The exercises seemed to</td>
<td>COM: Student clearly engaged</td>
<td>COM: The exercises seemed to</td>
<td></td>
</tr>
<tr>
<td>prompt experience with symbolic</td>
<td>in drawing</td>
<td>prompt experience with symbolic</td>
<td></td>
</tr>
<tr>
<td>(words/pictures). I saw some</td>
<td></td>
<td>(words/pictures). I saw some</td>
<td></td>
</tr>
<tr>
<td>evidence of increased risk-</td>
<td></td>
<td>evidence of increased risk-</td>
<td></td>
</tr>
<tr>
<td>taking in the content &amp;</td>
<td></td>
<td>taking in the content &amp;</td>
<td></td>
</tr>
<tr>
<td>style of drawing &amp; writing</td>
<td></td>
<td>style of drawing &amp; writing</td>
<td></td>
</tr>
<tr>
<td>also increased comfort with</td>
<td></td>
<td>also increased comfort with</td>
<td></td>
</tr>
<tr>
<td>doing this</td>
<td></td>
<td>doing this</td>
<td></td>
</tr>
<tr>
<td>Journal 8</td>
<td>Orange</td>
<td>Yellow</td>
<td>Peach</td>
</tr>
<tr>
<td>----------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td></td>
<td>C.1. Yes</td>
<td>2. From 2, more complex integrated, complex strong, especially #4</td>
<td>C.1. Yes</td>
</tr>
<tr>
<td></td>
<td>2. Much more engagement = technical, emotional energy increased</td>
<td>3. After #1</td>
<td>2. Steady progression each session beginning with scribble, ending with free floating forms</td>
</tr>
<tr>
<td></td>
<td>3. Change at #2</td>
<td>3. From 2, more complex integrated, complex strong, especially #4</td>
<td>3. Each session</td>
</tr>
<tr>
<td></td>
<td>E.1. None</td>
<td>E.1. NA</td>
<td>E.1. NA</td>
</tr>
<tr>
<td></td>
<td>2. Beginning</td>
<td>2. Beginning</td>
<td>2. NA</td>
</tr>
<tr>
<td></td>
<td>F.1. Yes</td>
<td>F.1. No &quot;not much&quot;</td>
<td>F.1. &quot;Not much change&quot;</td>
</tr>
<tr>
<td></td>
<td>2. Not as dramatically as in drawings. But writing became more personally meaningful. The drawings began to have stories.</td>
<td>2. NA</td>
<td>2. Some increase in the amount of writing</td>
</tr>
<tr>
<td></td>
<td>3. Included in 2</td>
<td>3. NA</td>
<td>3. Small increase each time</td>
</tr>
<tr>
<td></td>
<td>COM: Lots of experimentation with form/design in drawings. Writing more cautious, but real hints personal meaning</td>
<td>COM: Not much happened with the writing</td>
<td>Response to prompt</td>
</tr>
</tbody>
</table>

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Journal 9

Orange
C.1. Yes
2. Efforts scattered
    some risk-taking, some
dissociation
3. After #1
E.1. "stupid" end
2. beginning
F.1. Yes
2. Writing changed each time
    (1) brief/fairly thought-
    ful; (2) deeper/more
    curious/feeling
3. Included in 2

COM: After the 1st very assured
drawing, this student breaks
out into risk-taking, which I
gather is painful. Seems to
move from thought to feeling,
dry-juicy, controlled-loose

Yellow
C.1. Yes
2. From elegant, engaged
    confident "scene" to a
    kind of disturbed self-
    portrait
3. After #4
E.1. end
2. NA
F.1. Yes
2. less focused on the
    art, more centered on
    negative feelings
3. From #3-#4

COM: Again, the drawing &
writing seems to move from
reflection on the drawing
to reflections on current
state of mine - often
negative

Peach
C.1. Yes
2. Became more personal
    (difficult to judge,
    only 4 drawings)
3. NA
E.1. none
2. none
F.1. Yes
2. More info in response to
    prompts each time
3. NA

COM: NA
### Orange

1. **Yes**
   2. Drawings became more personal, more ideosyncratic, symbolically potent, the necessity to communicate & express powerfully began to dominate.

   **E.1.** None
   2. **End**

   **F.1.** Yes
   2. The press to communicate became stronger and stronger. The drawing & writing combo became essential.
   3. Big change in #4 to emotional outburst opens up whole emotional realm.

   **COM:** The press to communicate became so strong. The process allowed for outbursts. He needs/wants both drawing/writing simultaneously.

### Yellow

1. **Yes**
   2. From abstract to symbolic or storytelling.

   **E.1.** End "very negative 'fuck you, bitch'"
   2. **NA**

   **F.1.** Yes
   2. More concerned with current life, sex, problems with mother, birthday resentment over the task.
   3. #4 became angry.

   **COM:** The drawing released emotions, violence, reflection.

### Peach

1. **Yes**
   2. Not much change until session 6 (last drawing) then really seems to reflect person in drawing with things in her life.
   3. Included in 2.

   **E.1.** Beginning
   2. **None**

   **F.1.** Yes
   2. At first seemed resistant to writing but, over each session opens up more & more.
   3. Finally begins to reflect in session 5 & 6.

   **COM:** Writing & drawing don't seem related to each other. Seems to take the drawing activity seriously but "blows off" written activity (to avoid exposing himself?) at first.
Journal 11

Orange

C.1. Yes
2. Each drawing is quite different from the last. Experimentation with color, design control, content, abstraction, representation.
3. Most dramatic #3: more expression of feeling, less control.

E.1. NA
2. Beginning & #3

F.1. Always engaged, even when comments negative
2. Last writing focuses solely on meaning - straight to the heart of the matter
3. Throughout = invested with feeling, emotion towards end = less self-conscious talk about exercise, more about meaning alone.

COM: Exercises seemed to stimulate variety in terms of expression and somehow this person headed towards a straight zap to the symbolic heart.

Yellow

C.1. Yes
2. From abstract to more representational
3. #5-#6

E.1. Beginning, throughout, end
2. NA

F.1. Yes
2. Less writing produced

Peach

C.1. Not much
2. In middle session, person seemed bored - did not want to be engaged, but in 2 remaining sessions again became engaged.
3. Most significant drawing seems to have occurred in session 2.

E.1. NA
2. NA

F.1. Not much variation over sessions
2. Writing did seem to explain - define drawings
Journal 12

Orange

C.1. Yes

2. Away from grace/sureness
to experimentation with

texture

3. Each time

E.1. "stupid" beginning

2. Throughout

activity,

F.1. Yes

2. Opened up to meaning and

sureness about symbol-
izing meaning.

3. Each time - risk taking
each time

COM: The "story" the narrative

stronger than the symbolization.
Writing more fluent. Willing
to take risks in drawing, though

Yellow

C.1. Yes

2. Became less elegant,

less lyric, more

constrained

3. NA

E.1. Beginning

2. Beginning

F.1. NA

2. NA

3. NA

COM: I loved this person's 1st
drawing.

Peach

C.1. Only 3 drawings available.
Can't really assess
change.

2. NA

3. NA

E.1. None

2. Throughout "not

but positive/hopeful

re: life, future

F.1. Writing

2. Seems in beginning -

response to prompts then

moved beyond to poems.

3. Session 3, 4, more with

poem or poetic form, then

in sessions 5 and 6 seemed

to return to more response
& reflection to prompt

question

COM: The "story" the narrative

stronger than the symbolization.
Writing more fluent. Willing
to take risks in drawing, though
Orange
C.1. Yes
3. Included in 2

E.1. None
2. Throughout

F.1. Yes
2. Always symbolism, emotional content. This person's particular life events become more essential. In and out of abstraction. Communicating meaning more & more vitally important.
3. Included in 2

COM: Strong push towards communication, importance of communication.

Yellow
C.1. Yes
2. More integrated and strong til 6
3. 1-5 more refined & elegant - #6 to concrete illustrative

E.1. Beginning
2. Beginning

F.1. Yes
2. More personal - about life - less interpretive of the drawing
3. at #6

COM: This appears to be an open, verbal, expressive kid already.

Peach
C.1. Yes
2. Change seems related to willingness to express, open himself (expose himself)
3. Change each time

E.1. None
2. Throughout

F.1. Yes
2. Again, change seems related to willingness to communicate & open himself up. Each time admits it's not going way he wants, but still jumps in.
3. Included in 2

COM: This person appears quite talented both artistically and verbally. This type of activity seems to enhance, bring out the best in him. He wants to communicate.
### Journal 14

<table>
<thead>
<tr>
<th>Orange</th>
<th>Yellow</th>
<th>Peach</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.1. Yes</td>
<td>C.1. Yes</td>
<td>C.1. Not much change</td>
</tr>
<tr>
<td>2. Increased focus/containment/narrowing field &amp; color range</td>
<td>2. More engaged, thoughtful</td>
<td>2. &quot;cleaner&quot; as sessions go on perhaps but don't seem more &quot;creative.&quot;</td>
</tr>
<tr>
<td>3. Each time</td>
<td>3. After #1</td>
<td>3. Included in 2</td>
</tr>
<tr>
<td><strong>E.1.</strong> None</td>
<td><strong>E.1.</strong> NA</td>
<td><strong>E.1.</strong> NA</td>
</tr>
<tr>
<td>2. Beginning</td>
<td>2. Throughout</td>
<td>2. NA</td>
</tr>
<tr>
<td><strong>F.1.</strong> Yes</td>
<td><strong>F.1.</strong> No</td>
<td><strong>F.1.</strong> Yes</td>
</tr>
<tr>
<td>2. Personal life meaning to honesty about exercise</td>
<td></td>
<td>2. Increased retrospection increased response to prompt</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Increasing each session</td>
</tr>
</tbody>
</table>

**COM:** Mixed feeling about the exercise: should I do this? she asks

**COM:** I see change in drawing but little change in engagement in writing

---

### Journal 15

<table>
<thead>
<tr>
<th>Orange</th>
<th>Yellow</th>
<th>Peach</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.1. Yes</td>
<td>C.1. Yes</td>
<td>C.1. NR only 2 drawings</td>
</tr>
<tr>
<td>2. Representational &amp; personal to abstract/elegant</td>
<td>2. More original, abstract less tied to the known, i.e., the little figures</td>
<td></td>
</tr>
<tr>
<td>3. Only 2 drawings</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>E.1.</strong> None</td>
<td><strong>E.1.</strong> Beginning</td>
<td><strong>E.1.</strong> NR only 2</td>
</tr>
<tr>
<td>2. End</td>
<td>2. NA</td>
<td>2. NR</td>
</tr>
<tr>
<td><strong>F.1.</strong> Yes</td>
<td><strong>F.1.</strong> Yes</td>
<td><strong>F.1.</strong> NR only 2 samples</td>
</tr>
<tr>
<td>2. Became more personal/infused with personal meaning</td>
<td>2. Less engaged, less responsive to prompt</td>
<td></td>
</tr>
<tr>
<td>3. #2 (last)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**COM:** While the drawings changed from more personal to more abstract, the writing became more infused with personal meaning.

**COM:** Hard to judge from only 2 drawings

**COM:** Writing samples were not as prodigious as drawings. Too bad only 2 samples.
### Journal 16

<table>
<thead>
<tr>
<th>Color</th>
<th>C.1. Yes</th>
<th>Yellow</th>
<th>Peach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orange</td>
<td>2. Became potent, organized, vivid</td>
<td>C.1. Yes, but hard to tell</td>
<td>C.1. NA</td>
</tr>
<tr>
<td></td>
<td>3. #2</td>
<td>2. Less original</td>
<td>2. Only 2 samples difficult to assess</td>
</tr>
<tr>
<td></td>
<td>E.1. Beginning &quot;stupid&quot;</td>
<td>E.1. Beginning</td>
<td>E.1. None</td>
</tr>
<tr>
<td></td>
<td>2. Throughout</td>
<td>2. Beginning</td>
<td>2. Beginning only 2 samples</td>
</tr>
<tr>
<td></td>
<td>F.1. Yes</td>
<td>F.1. NA</td>
<td>F.1. Hard to judge - only 2 samples</td>
</tr>
<tr>
<td></td>
<td>2. More comfort/assurance thought</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. #2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**COM:** Hard to tell with just 2 samples, of course but #2 is so vivid.

### Journal 17

<table>
<thead>
<tr>
<th>Color</th>
<th>C.1. Yes</th>
<th>Yellow</th>
<th>Peach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orange</td>
<td>2. Towards experimentation with techniques</td>
<td>C.1. Yes</td>
<td>C.1. NA + &quot;Only 2 samples&quot;</td>
</tr>
<tr>
<td></td>
<td>E.1. End</td>
<td>C.1. Less engaged, less thoughtful, less strong viewer = further away</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. none &quot;in so many words&quot;</td>
<td>3. 1 to 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E.1. None</td>
<td></td>
<td>E.1. &quot;only 2 samples&quot;</td>
</tr>
<tr>
<td></td>
<td>2. None</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>F.1. Yes</td>
<td>F.1. No</td>
<td>F.1. &quot;only 2 samples&quot;</td>
</tr>
<tr>
<td></td>
<td>2. The first seemed more content/meaning laden, the second more about technique, experimentation, also more dissociation #2.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**COM:** Would like to see more samples - Wonder what the dissociation in #3 is about. **COM:** Hard to tell - no intent to write more. **COM:** Very reflective, individual - regret that there are only 2 samples. More reflective on 1st samples.
### Journal 18

<table>
<thead>
<tr>
<th>Orange</th>
<th>Yellow</th>
<th>Peach</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.1. Yes</td>
<td>C.1. Yes</td>
<td>C.1. NR &quot;Only 2 samples&quot;</td>
</tr>
<tr>
<td>2. Towards boldness</td>
<td>2. More integrated</td>
<td></td>
</tr>
<tr>
<td>3. #2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| E.1. Beginning "stupid" | E.1. Beginning | E.1. NR "Only 2 samples" |
| 2. Throughout | 2. Beginning | |

| F.1. Yes | F.1. Yes | F.1. NR "Only 2 samples" |
| 2. More engagement | 2. Simile in sample #2 | |

**COM**: I want to see more!

### Journal 19

<table>
<thead>
<tr>
<th>Orange</th>
<th>Yellow</th>
<th>Peach</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Only 1</td>
<td>C. NA</td>
<td>C. Only 1 sample</td>
</tr>
<tr>
<td>E.2. Yes</td>
<td>E. Beginning</td>
<td>E. Only 1 sample</td>
</tr>
<tr>
<td>F. Only 1</td>
<td>F. NA</td>
<td>F. Only 1 sample</td>
</tr>
</tbody>
</table>

**COM**: Wow! Beautiful! Only one to look at!

**COM**: Can’t judge over time because only 1

**COM**: Regret there is only 1 sample - seems as though this person could really have benefitted from program (judging by quality of one sample)
Journal 20

Orange

C.1. Yes
2. More experimentation/variety/flow/command of "newness."
3. Throughout

E.1. Throughout "nothing," "stinks"
2. End

F.1. Yes

2. From "nothingness" to specific feelings/problems = physical ones to comments on design.
3. Nothingness to #3 (personal/particular)
   #6 ( impersonal/particular)

COM: From the un-named to the named. From unnamed/personal to named personal to named/impersonal.

Yellow

C.1. Yes
2. Less engaged - from squiggley lines to large, simple shapes
3. From 1 to 3, from 4 to 5

E.1. Throughout - negative emotions
2. NA

F.1. Yes barely

2. Slightly more

COM: This person was negative - resistant - got Less engaged.

Peach

C.1. Yes
2. Some change - seemed related to more flexibility. Drawings became looser.
3. Steady increments

E.1. Throughout - negative emotions
2. None

F.1. No - not much significant change - person seemed focused on things beyond activity.

COM: The self-esteem of this person seems low - could use more of this kind of educational positive approach.
BIBLIOGRAPHY


Seven ways of knowing, not one. (1988). *Education Week*.


