Loyola University Chicago
Loyola eCommons

Dissertations | Theses and Dissertations

1989

From Training to Transfer: The Role of Creativity in the Adult Learner

Robin. Fogarty
Loyola University Chicago

Follow this and additional works at: https://ecommons.luc.edu/luc_diss

 Part of the Education Commons

Recommended Citation

Fogarty, Robin., "From Training to Transfer: The Role of Creativity in the Adult Learner" (1989). *Dissertations*. 2643.
https://ecommons.luc.edu/luc_diss/2643

This Dissertation is brought to you for free and open access by the Theses and Dissertations at Loyola eCommons. It has been accepted for inclusion in Dissertations by an authorized administrator of Loyola eCommons. For more information, please contact ecommons@luc.edu.

This work is licensed under a Creative Commons Attribution-Noncommercial-No Derivative Works 3.0 License.
Copyright © 1989 Robin. Fogarty

FROM TRAINING TO TRANSFER
THE ROLE OF CREATIVITY
IN THE ADULT
LEARNER

by

Robin Fogarty

A Dissertation Submitted to the Faculty of the Graduate School
of Loyola University of Chicago in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Philosophy

April

1989

© Copyright by

Robin Fogarty

1989

In loving memory

of my mom,

Jane M. Vickary Gray, P.P.C.C.C.,

who always wanted some initials

after her name.

ACKNOWLEDGEMENTS

A number of people deserve thanks for their generous support during this project: Dr. Barney Berlin, Chairman of the dissertation committee, for his friendship and help throughout my doctoral studies and for his assistance on this paper; Dr. Arthur Costa, for his expertise in the area of cognitive behavior; Dr. Steven Miller for his knowledgeable suggestions regarding qualitative analyses and Dr. Diane Schiller, for her encouragement and skill in the area of staff development.

In addition, the hard work and thoughtful contributions of the school district personnel, as well as the participation of the five teachers who made the study possible are appreciated.

The patience and assistance in the preparation of the manuscript that Enid Baxter gave is genuinely commended. The continued encouragement of James Bellanca is acknowledged, as well as the support of understanding friends and family members.

FOREWORD

> In most lives insight has been accidental. We wait for it as primitive man awaited lightning for a fire. But making mental connections is our most crucial learning tool, the essence of human intelligence: to forge links, to go beyond the given, to see patterns, relationships, context (Ferguson, 1980, p. 32).

Beginning with the hypothesis that creativity is an element in facilitating transfer of adult learning, the study describes a case study design. Further hypothesized are five learner types that seem to emerge in trainings. These learner types are depicted by the following behaviors: do nothing, practice, apply, bridge, innovate. Through a nomination process, five teachers are selected who are suspected of having a predisposition toward Learner Type 5 who will "leap to transfer and beyond" as they progress through a training program in cognitive skills and strategies for the classroom.

A review of the literature includes an examination of transfer theories, creativity, and creativity and the teacher. From the literature base, two theoretical frameworks support the study. Transfer theory suggests simple transfer and complex transfer as organizers in examining transfer behavior. At the same time, theories of creativity using personality characteristics with risk taking as an overriding trait, become the second major organizing concept.

Using Glaser's (1965) Constant Comparative Methodology, the reader is given brief classroom scenarios of the five subjects studied. The scenarios provide the basis for analysis as episodes are coded,

compared, and integrated. Proceeding from coding that describes the teacher transfer behavior as overlooked, simple, or complex, and coding observed creative behavior, the codes are eventually integrated into categories that present a continuum of transfer behavior. The categories arranged along the continuum are: overlooks, duplicates, replicates, integrates, maps and innovates. Creative behaviors of persisting, observing, differentiating, combining, associating and diverging are plotted along a similar continuum that ranges from low risk to high risk.

Finally, using graphic displays to clarify the emerging ideas, a theory is developed in the final phase of the analysis. This theory suggests that complex transfer levels are related to creativity. As the complexity of transfer increases, the risk factors also increase. In addition, the concept of situational dispositions toward transfer is discussed as a more appropriate representation of adult learner behavior than the concept of learner types.

The paper ends with conclusions drawn and a discussion of implications for both individual adult learners and for staff development training practices. A brief discussion of the limitations of the study is also included.

VITA

The author, Robin J. Fogarty, is the daughter of Eugene Paul Vickary and Jane (Mannolini) Vickary. She was born April 2, 1943 in Cobleskill, New York.

Her elementary and secondary education were obtained in the public schools of Canajoharie, New York, where she graduated in 1961.

In June, 1964, she received the degree of Bachelor of Science in education from the State University of New York at Potsdam. In 1964 she began teaching in East Aurora, New York.

Moving to Chicago, Illinois in February of 1968, she taught in the elementary grades in Des Plaines, Illinois until June, 1981. She taught gifted education in Palatine, Illinois in 1982 and 1983. In August of 1984, she earned the Master of Arts degree in education from National College of Education in Evanston, Illinois.

In September 1984 she became elementary supervisor in Palatine, Illinois and in August of 1985, she became Director of Training and Development for Illinois Renewal Institute, Inc., and is presently in that position working as a national consultant to school districts throughout the United States.

She is co-author of Patterns for Thinking, 1985, Teach Them Thinking, 1986, Catch Them Thinking, 1986, and author of The Thinking Log, 1986, The Thinking/Writing Connection, 1988 and co-author of Start Them Thinking, 1988, as well as a regularly contributing author to Challenge magazine, 1984-1988.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

CONTENTS OF APPENDICES

CHAPTER I

STATEMENT OF PURPOSE AND RATIONALE

> There is about creativity a mystique of talent and intangibles. They may be justified in the art world where creativity involves aesthetic sensibility, emotional resonance and a gift for expression. But it is not justified outside that world. More and more creativity is coming to be valued as the essential ingredient in changes and in progress (de Bono, 1973, p. 11).

The purpose of this study, "From Training to Transfer: The Role Of Creativity In Adult Learning," was to examine through case studies of teacher trainees, the transfer of learned skills and strategies into the classroom. Of special interest in this study was the role that creativity played in facilitating the transfer for individual adult learners.

Description of The Training

The study was conducted as part of a "Patterns for Thinking" teacher training. The primary goal of the training was to build awareness in the area of critical and creative thinking skills and to practice skills and strategies that the teacher could use within the content of regularly scheduled lessons to infuse appropriate thinking skills into the lessons. The training stressed a process approach to instruction versus an approach that only values products.

Clearly, the study was not to judge one trainee as better than another but to take the recognized differences in adult learners and

closely examine the cases where "transfer" and/or creative innovation seemed to occur spontaneously and naturally; to look comprehensively at the learner who was most likely to generalize and extrapolate generic meaning.

By comparing a cluster of cases of individual teachers who seem inclined to "leap to transfer and beyond," would patterns emerge that suggested elements or conditions or predispositions that allow, encourage, permit, foster, and/or invite, creative transfer of learning for adults trained in a comprehensive staff-development model.

Description of Learner Types

Understanding the differences in how individuals approach life and learning was basic to this research. Yet, over time, human beings have traditionally sorted themselves into recognizable groups or clusters.

Pythagoras used to say life resembles the Olympic Games; a few men strain their muscles to carry off a prize; others bring trinkets to sell to the crowd for a profit; and some are there who seek no further advantage than to look at the show and see how and why everything is done. They are spectators of other men's lives in order to better judge and manage their own.

Oliver Wendell Holmes noted this same phenomenon, but with a slightly different flavor. He said:

> There are one-story intellects, two-story intellects, and three-story intellects with skylights. All fact collectors who have no aim beyond their facts are one-story men. Two-story men compare, reason, generalize, using the labor of fact collectors as their own. Three-story men idealize, imagine, predict-their best illumination comes from above the skylight (Bellanca & Fogarty, 1987, p. 44).

Joyce and others refer to particular learner types in their work in staff development. They categorize growth states of learners as:

(1) Omnivores - actively use every available aspect of formal and informal systems available to them.
(2) Active Consumers - less initiative than omnivore, but full of activity.
(3) Passive Consumers - there when opportunity presents itself but rarely seek or initiate new activities.
(4) Entrenched - not likely to seek out training and when they do take training, it is in areas of previous success.
(5) Withdrawn - require a great deal of energy from outside to become involved (Joyce, Hersh et al., 1983).

To expand on the concept of individual adult learners sifting themselves into clearly differentiated categories, the following cluster descriptions represent the learner groups that seemed, through the past experiences of this researcher, to have emerged in teacher trainings. Note, however, that this over-simplification of "cluster types" was developed to facilitate the research and its findings. The clusters were not, in reality, as pure as suggested here. After all, the subject of human activity does not categorize as neatly as one might desire for purposes of research.

Briefly, the five categories or clusters of teacher trainees, witnessed by the researcher, were described with the following metaphors:

(1) Head-in-the-Sand Ostrich: Does-nothing; unaware; the shot doesn't take; there appears no evidence of use of skills or strategies.

(2) Drilling Woodpecker: Practices exactly as modeled; no more; no less; one or two short pecks.

(3) Look-alike Penguin: Applies skills and strategies appropri-

application areas; uses as generic template but in only the one area.

(4) Carrier Pigeon: Generalizes skills and strategies and bridge into various content situations; vary application; carries ideas into new areas.

(5) Soaring Eagle: Extrapolates essence and innovates beyond skills and strategies presented; senses no boundaries or limits; free form; creative.

Figure 1: Hypothesized Learner Types

Head-in-Sand Ostrich	Drilling Woodpecker	Look-Alike Penguin	Carrier Pigeon	Soaring Eagle
Learner Type 1	Learner Type 2	Learner Type 3	Learner Type 4	Learner Type 5
Does Nothing	Practices	Applies	Transfers	Innovates

The diagram in Figure 1 implies that the teacher trainee may actually fit into learner types labeled 1-5 at various stages of learning, throughout the multiple training sessions. Also, learners may "skip" to advanced stages without experiencing each stage progressively. Or, their stay at any one stage may be relatively brief and thus undetectable. This study was focused on the adult learners who seemed

undetectable. This study was focused on the adult learners who seemed most likely to advance to stages 4 and/or 5 after participation in the training sessions. Specific criteria for identifying the participants for the study included: past teaching performance, personal background information, participant questions asked in the training sessions, amount and level of participation in the training sessions and artifacts representative of various classroom applications. Input from current supervisors and colleagues, as well as voluntary self-nomination also provided support for the final selection of candidates to study.

Figure 2: Dynamics of Hypothesized Learner Types

TRAINING

Figure 2 - Code

Type (1) Head in Sand

Type (2) Drilling Woodpecker

Type (3) Look-A-Like Penquin

Type (4) Carrier Pigeon

Type (5) Soaring Eagle

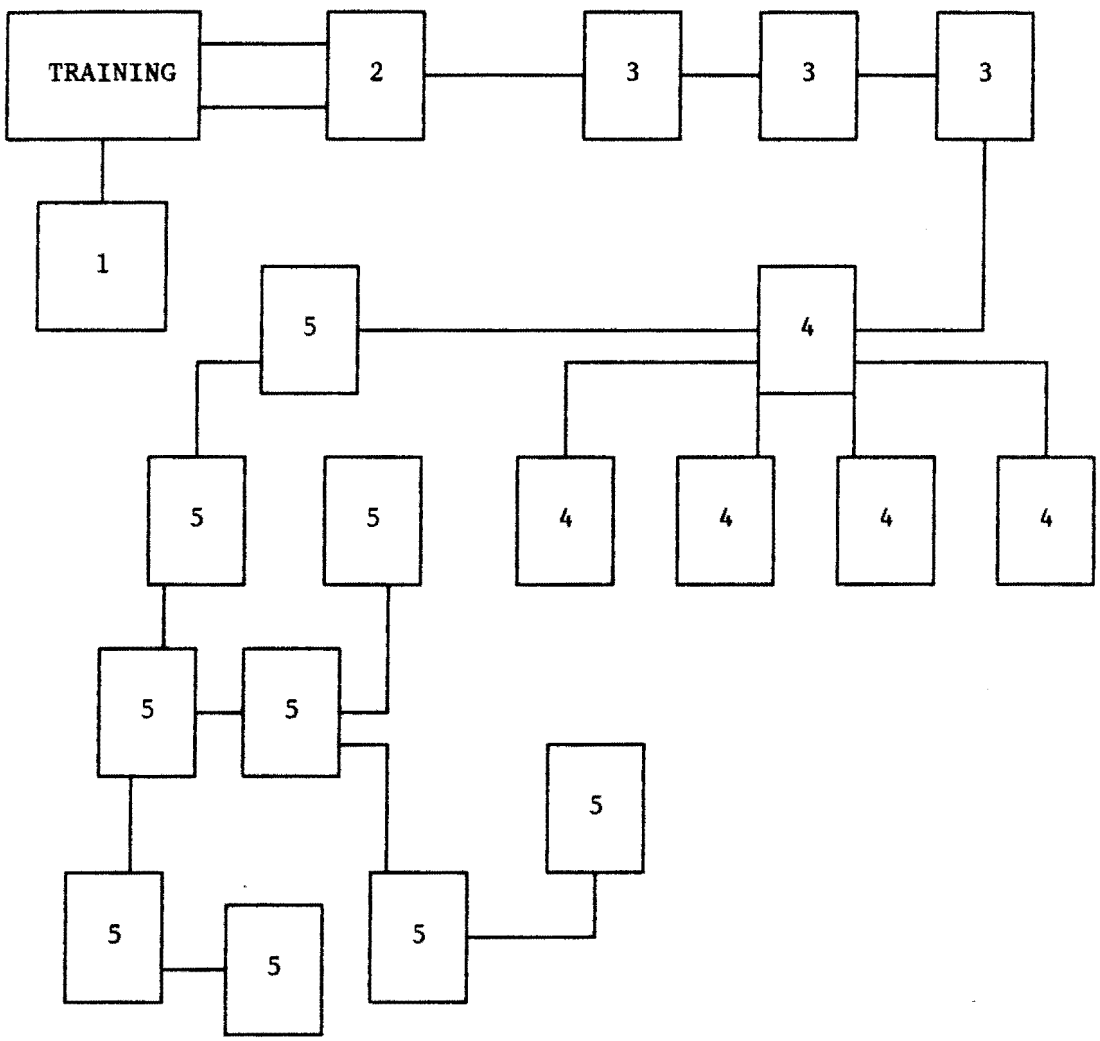


Figure 2 illustrates the five categories of adult learners defined by the researcher. To further illustrate the distinctions among the five types, the following descriptions accompanied the visual interpretations of Figure 2.

Learner Type 1: Head-in-the-Sand Ostrich

Type 1 signified the Head-in-the-Sand Ostrich. This participant attended the training but did-nothing with the new learning back in the classroom. For example, the training included an attribute webbing activity in cooperative groups. The skill of analysis of attributes and the strategy of structured interaction in small groups were modeled and practiced in this activity in the training. Processing by participants revealed the purpose, benefits and barriers of the activity.

The teacher had an opportunity to use the skill and webbing strategy the next week in the classroom as part of a novel unit on, The Old Man and The Sea. However, the Learner (1) did not grasp the opportunity to practice the newly learned skill. In fact, this Type 1 learner did not recognize this as a "teachable moment" in which to try the new strategies.

Actually, the Type 1 learner seemed unaware of the "teachable moment" when it occurred. This Type 1 learner did not connect lesson options with the new learning, and simply presented the lesson on The Old Man and The Sea just as it had been presented before the training. The skill/strategy had not been internalized or integrated into the consciousness of the learner. Typically, the Type 1 participant returned to the training and said, "The ideas were great, but they don't fit my subject area" or a similar disclaimer. Often, this was the

learner who left a training with the feeling that there was nothing relevant, practical or useful to take away. This learner type did not seem to bridge the learnings into personally meaningful ways.

Learner Type 2: Drilling Woodpecker

Type 2 represented the teacher - learner who practiced the skill exactly as modeled in the training. This Type 2 learner was the Drilling Woodpecker. This learner left the training, "stealing" the idea verbatim, and practiced at the first opportunity. To illustrate the Type 2 behavior more specifically, an actual instance from the training was elaborated.

To model and practice the concept of higher order questions to stimulate student to student interaction and student articulation, a strategy called "The People Search" was presented during the first training session. In this strategy, divergent, open-ended statements focusing on a particular concept were listed on a paper. The task called for each participant to move about the group and "Find someone who..." could perform the cued question or statement. For example, the modeled "People Search" focused on the concept of thinking and different levels of Bloom's Taxonomy:

Find someone who...

(Knowledge)	1. Can name the sculptor of "The Thinker."
(Comprehension)	2. Can explain inductive and deductive lesson design.
(Application)	3. Can give both sides of an argument in two minutes.
(Analysis)	4. Can classify teachers into four different groups.

(Synthesis) 5. Can give you a metaphor for:
Thinking is like _____ because both _____.

(Evaluation) 6. Ranks these items the same as you do.
Mind _____ Body _____ Soul _____.

The learner designated as a Type 2 actually copied the sheet used in the training for the students or used the model and changed the focus slightly. For example:

(Knowledge) 1. Can name the author of _____. (Slight change)

(Comprehension) 2. Can explain _____. (Slight change)

(Application) 3. Can give both sides of an argument in two minutes. (No change)

(Analysis) 4. Can classify students into four different groups. (Slight change)

(Synthesis) 5. Can give a metaphor for: Thinking is _____. (No change)

(Evaluation) 6. Ranks these items the same as you do.
Mind _____ Body _____ Soul _____.
(No change)

This learner did not "see" the real value of this strategy as a generic interactive piece that could become a part of the repertoire of teaching techniques. This learner seemed only to see it as a new activity to use once; a new activity to "spice up" the day. A series of adaptations beyond that "one shot" did not usually occur.

Learner Type 3: Look-Alike Penguins

Type 3 denoted the Look-Alike Penguin, who applied the skill/strategy in meaningful ways in the classroom. For example, the Type 3 learner saw the skill/strategy as a template to help shape personally relevant curriculum. The Type 3 learner took "The People Search" and used it as modeled, but went one step further by adapting it several

times throughout the week and applied it as a strategy in multiple situations: literature class, composition class, and drama class. However, the differentiating factor between the Type 3 learner and the next Type 4 learner was that the Type 3 learner never really changed the model in any radical way. Each "People Search" looked the same. Over time, the skill/strategy became over-used, mundane, forgotten or periodically resurrected for the same application next year.

Learner Type 4: Carrier Pigeons

Type 4 illustrated the learner defined as the Carrier Pigeon. The Type 4 learner, transferred the skill/strategy into relevant and varied situations, adapting and modifying the concept for enhanced use. For example, a high school English literature teacher attended a training session and learned about the attribute webbing skill/strategy for analyzing attributes. Participants left the session with a commitment to "try" some of the ideas in the classroom before the next training session and to come prepared with "artifacts" and descriptions of the classroom trial experiences.

In the next training session, the English literature teacher shared an "artifact" from classroom practice: The lesson was an introduction to a unit on the contemporary short story. It was taught prior to students reading a series of selected short stories in which they would establish a sense of the modern short story. The selections were:

James Thurber, "The Secret Life of Walter Mitty"

Richard Wright, "The Man Who Was Almost A Man"

Bradbury, "August, 2026: There Will Come Soft Rains"

Shirley Jackson, "The Lottery"

Ralph Ellison, "Battle Royal"

Sherwood Anderson, "The Egg"

The teacher assigned the concept of "The American Dream" as a focus concept for the webbing. This advanced organizer was used as a thread to tie the short stories together in terms of discussing how each author depicted "The American Dream." Groups of three to four juniors were given large sheets of butcher paper, markers and instructions to be as creative as they wanted in their webbings. (The strategy had been modeled by the teacher one time before as a total class activity.)

The artifacts evidenced a variety of representations of the webbing of "The American Dream." See Appendix D.

- A Christmas Tree with ornaments as sub-clusters
- An American Flag - as the web center
- A musical staff with notes and sub-ideas clustered around each note
- A loosely formed web with cartoon characters with notes and dialogue surrounding the center concept

The teacher explained this lesson during the second training and shared the artifacts with obvious excitement at the richness of the student thinking evidenced in the products. Other teachers in the training asked clarifying questions and were sparked by the bridging of this skill/strategy into a meaningful lesson format.

Upon asking the teacher if the notion of "The American Dream" had been a concept focus in previous presentations as the unifying concept in introducing the unit, the answer was:

"No. But in trying to figure out how I might lead them into the analysis activity of webbing the themes and ideas that emerge in the readings, I was forced to find a focus, a unifying thread. As the idea appeared - The American Dream - I realized I had synthesized my conceptual framework for the unit. Now, we can use the student webs as points of reference throughout the readings - revising, enhancing and structuring a general picture of what the authors convey throughout these pieces."

It appeared that this teacher not only highlighted an overriding purpose for the lesson, but in turn, the students also had the advantage of an advanced organizer - a conceptual framework to use in making meaning from the short story unit. This thread tied the next several weeks of lessons together conceptually.

Learner Type 5: Soaring Eagles

Type 5 represented the learner defined as the Soaring Eagle. The Type 5 learner synthesized new information, connected it to other notions, adapted, modified, elaborated and finally innovated a novel application.

There is one brief example to illustrate this; recall "The People Search" strategy. The Type 5 learner took the essence of the idea: to stimulate questions that cause interaction and articulation - and wrote an adaptation of the "search." The questions and statements flowed with an original and often humorous or philosophical flavor and a noticeable fluency. This learner type often had completed a personal version of "The People Search" before the end of the first training day, anxious to try it the next day in class.

For example, to introduce the concept of history to high school juniors, who were somewhat unmotivated about beginning the history course, this search was used:

Find someone who:

1. Knows what history is.
2. Knows when history begins.
3. Believes "Great men make great events."
4. Believes "Great events make great men."
5. Thinks history is just a bunch of dates.
6. Knows an historical date.
7. Has been on a date.
8. Is a part of history.
9. Knows tomorrow's history.
10. Wants to learn about history.

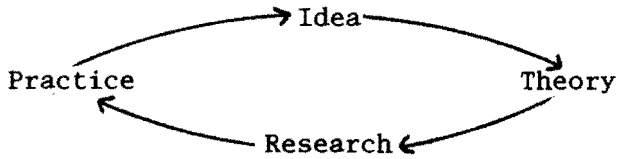
Note the nature of questions/statements and the underlying sense of purpose the teacher evidences in the formulation of the search. The Type 5 learner went beyond the model, extrapolated the relevance and generalizability of the skill/strategy and creatively infused it into an existing repertoire of instructional techniques. The elaboration and invention continued as this Type 5 learner instructed a small group of students in how to develop their version of a "People Search" for geography class. This Type 5 learner had modeled well, instructed in the procedure for developing a search, and trusted that the students could do an exemplary job.

The Type 5 learner seemed to sense that student development of the questions/statements was an enhancement to the activity focusing on interaction and articulation. Students were applying the skill the leader had learned. This was the inventive learner, the creative thinker, the one who automatically went beyond the training.

This learner seemed to possess an added dimension, a mind set for elaboration. In fact, as Alan J. McCormack and David Perkins note, "Creative thinking is largely a state of mind. It seems to be primarily thinking guided - indeed driven-by a desire to seek the original. It values mobility; it revels in exploration; it requires flexibility; and it honors diversity." As Perkins describes it, "Creative thinking attends to purpose as much or more than to results, works at the edge of one's competence rather than within the comfortable core of such competence, and is driven by an intrinsic motivation to be original" (Beyer, 1987, p. 35).

Statement of Purpose

The study followed the path described by David Johnson, a social psychologist from the University of Minnesota. He describes his research on cooperative learning by explaining the cycle that propels his work (Johnson, 1988). Through experiences, one gets an idea. The idea is then tied to existing theory and/or developed into new theory. From the theory, a research study is designed. In turn, the results of the study bring the investigative process full circle as the ideas are integrated, or rejected, as part of accepted practice. Again, in turn, the results suggest further ideas for study.



He sees the bridge from practice to research and from research to practice as the critical linkage in investigative work.

Following Johnson's schematic, this researcher has informally observed that the transfer effects of teacher trainees seem to vary along a continuum. The changed teaching behaviors range from "No observable change" at one end of the spectrum to "creative innovation" at the other end.

Noting this phenomena over several years of work as a teacher trainer, this researcher became intrigued with the trainees who seemed to not only apply new learnings as modeled, but "leaped to transfer and beyond" with the skills and strategies presented. These learners contrasted sharply with others in the same sessions who did not make even the most basic transfers such as grade/content/learner - appropriate adaptations. This second group of teachers practiced in limited ways and seemed unable or unwilling to go to that next step independently.

While variations of skill competence, application and appropriateness of use are expected outcomes of teacher trainees (Joyce and Showers, 1988), the current research does not appear to address the role of creativity in facilitating effective transfer. Yet, informal observation and feedback from training conducted by this investigator over the past several years hinted at the notion that the more creative

teacher seemed to be the trainee who most readily transferred the learned skills and strategies into relevant classroom applications.

The fact that some teachers were able to attend a training, learn the material and use the information creatively, to affect their classroom instruction positively, and others were not, provided the rationale for this study. Joyce and Showers (1988) believed that staff development models based on teacher training do impact student achievement. One of the goals of the staff development used in this study was to effect change in the instructional delivery of teachers to increase student intellectual activity. If the link between creativity and transfer in adult learners could be substantiated, teacher trainings and other staff development activities could be deliberately structured to tap the creative energies of teacher trainees.

While Joyce and Showers (1988) have established that an inservice design that provides theory, demonstration, practice, feedback, and coaching were key elements to effecting lasting transfer, the creative component may prove to be another critical link to unleashing skilled and appropriate transfer for newly trained teachers. How critical the creativity connection is to transfer was another question. This study intended to merely look for evidence that a definite connection between creativity and transfer in adult learners did exist. If this link between creativity and transfer did exist, it might lead to more effective change models in staff development programs.

In summary, this investigator has stated the purpose and rationale for the study: "From Training To Transfer: The Role of Creativity In The Adult Learner." In addition, a brief description has been given

of the teacher training that acts as the launch pad for the study of creativity and transfer. Finally, conceptual learner types have been initially defined using specific examples of transferred skills and strategies.

CHAPTER II

REVIEW OF RELATED LITERATURE

Ah yes,
We shall not cease from exploration
And the end of all our exploring
Will be to arrive where we started
And know the place for the first time.
Through the unknown, remembered gate
When the last of earth left to discover
Is that which was at the beginning;
At the source of the longest river
The voice of the hidden waterfall
And the children in the apple tree
Not known because not looked for
But heard, half-heard, in the stillness
Between the waves of the sea (Eliot in Eisner, 1979, p. 1).

The primary focus of this study was to analyze the role that creativity played in the transfer of learning for adults. With that purpose in mind, the review of the literature concentrated on transfer and creativity as the central theoretical frameworks. In addition, an attempt to note the literature relating transfer and creativity specifically to the teacher as an adult learner concluded this section.

Transfer Theory

Definitions

Transfer: to convey, shift or change from one person or place to another is the definition found in the dictionary. However, in the educational setting, the term transfer, or more specifically transfer of training, was historically attributed to Edward Thorndike. "Thorn-

dike maintained that there must be identical elements in what was encountered outside of school in order for students to apply what they were taught. He referred to this as transfer of training" (Tyler, 1986-87, p. 36).

Subsequent definitions of the term transfer, refer to "transfer of learning" as well as Thorndike's transfer of training (Hunter, 1973; Beyer, 1987; Perkins, 1988). Hunter (1973) defined transfer as the ability to learn in one situation and then to use the learning in other situations where it is appropriate; linking an old learning to the new.

Noted authorities in the cognitive science areas, such as Perkins (1985) and Sternberg (1984), as well as other researchers, Marzano and Arredondo (1986) and Beyer (1987) referred to transfer as application, use, generalization, extrapolation and elaboration. These terms appeared to be used interchangeably in discussions about transfer.

The current literature also suggested agreement on a further refinement in defining the concept of transfer by referring to two distinct types of transfer. Although agreement was evidenced in noting this dichotomy, there was a noticeable variance in the terms used to describe the two types of transfer.

Wittrock (1967) divided transfer into what he called "near" transfer and "remote" transfer. Near transfer referred to application within the same concept, while remote transfer referred to application to new concepts. Similarly, Beyer (1987) noted the dichotomy described by Perkins (1985) as "high road" transfer and "low road" transfer. According to Perkins (1985), high road transfer consisted of applying a

skill learned in one setting to another quite different setting, while low road transfer consisted of applying a skill learned in one setting to other rather similar settings.

Joyce and Showers (1983) evidenced a similar dichotomy in reference to transfer. Their terminology for the two types of transfer referred to "horizontal" transfer, in which a skill was directly shifted and "vertical" transfer, in which additional learning was required to transfer.

Sternberg (1984) again noted two types of transfer. However, he referenced "spontaneous" transfer and "guided" transfer. Spontaneous transfer appeared to occur automatically in similar situations, while guided transfer required explicit strategies to guide the transfer into new situations.

Perkins and Salomon (1988), in a recent journal article, referred again to "high road" and "low road" transfer. However, they also introduced two new ideas to further describe the concepts. "Hugging" was used to denote low road transfer, while "bridging" was used to denote high road transfer.

"To be sure, (as in low road transfer) sometimes transfer happens quite automatically in accordance with the "Bo Peep Theory" (Perkins & Salomon, 1988, p. 23) of transfer, which implies that (if you let them alone, they come home, wagging their tails behind them)."

> ... the transfer is likely to be "near" transfer, since the contexts have that surface perceptual similarity. High road transfer can bridge between contexts remote from one another, but it requires the effort of deliberate abstraction and connection-making and the ingenuity to make the abstractions and discover the connections (Perkins & Salomon, 1988, p. 27).

Teaching for Transfer

Hunter (1973), elaborated on the concept of transfer in yet another way. She saw transfer as a primary goal of education which helps students generalize from one subject and from one situation to another. Transfer, according to Hunter, was the process of past learning influencing the acquisition of new learning. Yet, she described concepts of both positive transfer and negative transfer.

In positive transfer, the process of old learning accelerated the acquisition of new learning, while in negative transfer, old learning interfered with new learning.

Hunter (1973) went on to outline four factors in a learning situation that promoted transfer. The first factor Hunter described was similarity; similarity in the environment, the learner's feelings or in the mode of attack. The second factor was labelled association. Association was the bonding that occurred when two events, feelings or actions have taken place at the same time. The degree of original learning was the third factor influencing transfer, according to Hunter. Finally, critical attributes which differentiated one thing from another was Hunter's fourth factor of transfer. This power of critical attributes could be applied in any situation, according to Hunter. She suggested that no one factor was more important than another and that the factors often worked in concert in bringing about transfer.

Beyer (1987) suggested yet another factor in bringing about transfer. He referred to explicit cues to signal the appropriateness of the transfer of a strategy or skill. Beyer felt that by talking about the opportunities for transfer, bridging was made more explicit.

Sidney Parnes (1975) seemed to support Beyer's notion of cuing transfer. Parnes said:

> I wonder what would happen if, from the earliest days of formal "teaching", the teacher or parent after presenting a new bit of learning ... would invariably ask next, "How might you use this bit of information? What new ways might you connect this with something else you know?" ... I would predict that by this one deceptively simple tactic, we might launch the next generation into a completely new level of mental power.... (Parnes, 1975, pp. 10-11).

Beyer suggested in his work on thinking skills that "unless they are repeatedly applied - with reflection - in additional contexts or with other kinds of data, they are not likely to be generalized to the point of even appearing to be useful or applicable in a variety of contexts" (Beyer, 1986, p. 164).

Beyer (1987) went on to say that the generalization of a skill must take it beyond the parameters of the setting in which it was initially learned. According to Beyer, transfer involved not only how to apply the learning in various contexts, but why it was appropriate and what the cues were that signaled the appropriateness.

Beyer (1987) promoted a theory of explicit teaching of the transfer, just as the original skill was taught. He built in explicit transfer lessons with multiple guided practices and independent practice in new contexts. Beyer, much like Hunter (1973), felt that the key to transfer or elaboration of a skill was the "review" of what students knew about the skill before they attempted to adapt it to new settings (Beyer, 1987). Also, and again like Hunter, Beyer suggested that attention to key attributes was essential in understanding a skill and its possible transfer into not only different academic subjects, but also into personal life experiences.

Perkins (1986), somewhat like Parnes (1975), approached transfer from the concept of connections. In Perkin's case he referred to connections that invited "exploration and exploitation" (Perkins, 1986, p. 222). He developed the notion of portable concepts and portable skills. Portable concepts were embodied in four questions that Perkins felt threaded throughout the academic disciplines and into life situations (Perkins, 1986). The four questions were:

1. What is its purpose?
2. What is its structure?
3. What are model cases of it?
4. What are the arguments that explain and evaluate it? (Perkins, 1986, p. 5).

Paralleling the portable concepts theory, Perkins (1986) suggested that there were portable skills, also, provided by high-level strategic knowledge. For example, once students have learned to design classification systems in context for chemistry, there was an opportunity to carry these abilities into economics or English. Perkins (1986) questioned the usefulness of Hunter's contention that transfer occurred along paths of similarity as a practical idea for fostering transfer. He stated, "... contexts we intuitively consider disparate may be quite similar at some deep level" (Perkins, 1986, p. 226). In refuting this notion as too shallow, Perkins admitted that low road transfer benefited from varied practice, but suggested that high road transfer required provocation to invent wide-ranging generalizations and applications.

Perkins and Salomon (in Perkins, 1986) suggested that practice, abstracting rules and anticipating application are useful tactics in promoting transfer. Other strategies for teaching for transfer, were generalizing a problem, focused retrieval (specific prior contexts) and metaphor-making in search of likenesses and similarities to known information promote transfer.

In a current journal article, Perkins and Salomon (1988) elaborated on the teaching of transfer. They introduced the terms "hugging" and "bridging" as mentioned earlier in this work. "Hugging," according to these researchers, meant teaching to better resemble conditions for low road transfer. "Bridging" meant teaching to better meet the conditions of high road transfer. They also made a case for the existence of important cross-cutting thinking strategies such as exploring a problem or self-monitoring, as well as discussing intermediate patterns of thinking that seem to cut across content, such as measuring and methodology. They felt bridging and hugging strategies were necessary to develop the overarching principles.

Sternberg and Davidson (1984) also supported the idea that teaching for transfer must embrace the guided or bridged approach to make explicit how to transfer. Feuerstein (1980) also elaborated on the concept of "mediators" to make application easier.

Training For Transfer

Moving from teaching for transfer where the focus of the research had been on students as learners, others have approached their research from the perspective of training and transfer, where the teacher as learner was the focus. Fullan alluded to this when he talked about

change at the teacher level. "Educational change depends on what teachers do and think - it's as simple and or as complex as that" (Fullan, 1982, p. 107). He discussed where teachers were, the introduction of change and whether or what changes were needed. For teachers to change (which implies transferring new strategies into their repertoires), Fullan contended that teachers used three main criteria:

1) Does the change address a need?
2) What will I have to do?
3) How does it affect me personally in terms of energy, new skill learning, and interference with existing priorities? (Fullan, 1982, p. 113).

However, Fullan continued, when changes involved a sense of mastery, excitement and accomplishment, the incentives for trying new practices were powerful (Huberman in Fullan, 1982).

Supporting Fullan's sense of the role of the affective in effecting change at the teacher level, Hord, Loucks and colleagues (Fullan, 1982) have conducted extensive studies on the reaction of teachers to innovation. Based on the earlier work of Fuller, Hord, Loucks and others use the Concerns-Based Adoption Model (CBAM) with teachers. The model identified stages of concern that ranged from an unrelated stance of awareness to concerns about informational and personal demands and management concerns to high impact levels in which consequence, collaboration and refocusing on universal benefits became the focus (Fullan, 1982).

Other researchers addressing the concept of training and transfer at the teacher level were Bruce Joyce and Beverly Showers. In Power in

Staff Development Through Research on Training, they state, "Relatively few persons, having mastered a new teaching skill, will then transfer that skill into their active repertoire. In fact, few will use it at all" (Joyce & Showers, 1983, p. 4).

Joyce and Showers (1983) contended that teacher training programs should incorporate the study of the transfer process itself. They developed the concept of "horizontal" and "vertical" transfer.

Horizontal transfer referred to the direct shifting of a skill from the training in order to solve problems. On the other hand, vertical transfer referred to the need for adaptation of the trained skills in order to fit the conditions of the workplace. Low transfer teachers, in Joyce and Showers studies, seemed to aim toward mastery of factual lists, while high transfer teachers seemed to focus on objectives such as comparisons ... or effects ... that stressed conceptual or analogical thinking.

In terms of vertical transfer, where substantial assistance was required, teachers who did not think conceptually about what they were taught, and how and why, were unable to use the new learnings during micro-teaching experiences.

Joyce and Showers (1983) indicated also, a concern for the affective elements. They advocated a learning to learn or metacognitive, reflective attitude was necessary for successful transfer.

In addition, they saw transfer as another stage of learning, paralleling the transfer necessary in athletic skills. With this analogy to sports in mind, Joyce and Showers (1983) outlined a model

for transfer that stressed "coaching" for confidence and integration as the skill was transferred into new settings.

Interestingly, the most striking difference, noted by Joyce and Showers, between athletes and teachers was the initial assumption held by each. "Athletes do not believe mastery will be achieved quickly or easily" (Joyce & Showers, 1983, p. 25). Teachers have been somewhat misled, according to these researchers, to think that a simple demonstration, a one-day workshop or a single video-tape was sufficient to ensure success in transfer into the classroom.

Elaborating on their theories, Joyce and Showers outlined a model of training for teachers that involves five components.

1. Presentation of theory
2. Modeling or demonstration
3. Practice in simulated or class setting
4. Structured, open-ended feedback
5. Coaching for confidence and integration (Joyce & Showers, 1980).

Coaching for application, hands-on, in-the-classroom assistance with transfer of skills and strategies was a necessary and key component of training, according to Joyce (1986).

Educators in the field of supervision supported the coaching theory. Garmston and Costa (1985) advocated a supervisory model called, Cognitive Coaching. The focus of this model was reflective, metacognitive self-examination toward change.

Robert Marzano supported a slightly different view in his work with teachers and thinking skill strategies or tactics for thinking. He stated that transfer of new skills would not occur in the classroom until teachers sensed a shift in their perceptions about their mission

or until teachers believed that the innovation or new methodology or content were of priority value (Marzano, 1986).

Thomas Sergiovanni (1987) alluded to this same phenomenon when he said, "To change our approach ... we must first change our mindscapes of how schools work and how life unfolds in the classroom" (Sergiovanni, 1987, p. 45). Sergiovanni said that teachers tend to ride the wave of the teaching pattern as it unfolds, accommodating to shifting circumstances. The emphasis was on the pattern of operation that proceeded in a predictable manner. He implied that educators must begin to value these patterns of behavior that evolve, for therein lay the seeds for transfer (Sergiovanni, 1987).

From yet another perspective, transfer was cited by Costa (1985) in his description of intelligent behaviors. Among the characteristics he delineated, Costa referred to "transference beyond the learning situation" (Costa, 1985, p. 290). In his discussion, he noted the tendency of such individuals to take learning from one area into another.

A final note approached by Costa, in terms of transfer, was that the focus on transfer should go beyond content transfer in academic areas. Transfer of intelligent behaviors must integrate into life situations, beyond the schoolhouse.

Summary

In sum, the literature suggested agreement among the authorities in broadly defining the term transfer, and while there was diversity in the labelling language used, there was further agreement that transfer involved two distinct concepts: simple transfer and complex transfer.

Again, whether speaking of student transfer of learning or teacher transfer of training, there appeared to be consensus on the need for explicit attention to transfer as though it were, in Joyce and Shower's (1983) terms, another stage of learning.

Also, in conclusion, as evidenced in the number of recent references (late 1980's) in the literature to transfer, the concept of transfer seemed to be becoming a major curricular focus, both for students and for teachers.

Creativity

The body of literature surrounding the term creativity was extensive and overwhelming. This review, by no means represented an exhaustive search, but it did relate sufficiently both historical and contemporary views on the subject.

Defining Creativity

> Merely having the knowledge, the bits and pieces in the kaleidoscope does not guarantee the formation of new patterns. One must "revolve the drum," manipulate the knowledge by combining and rearranging facts into new patterns. In the mind, these new patterns are "ideas" (Parnes, 1972, p. 7).

In order to study creativity and its relationship to the transfer of learning in adults, a working definition of what was meant by creativity was essential. Webster simply defined creativity as: 1. the quality of being creative, 2. the ability to create. This clean bone definition, however, did not satisfy the appetite of the inquiring mind. There was nothing there to chew on. Yet, it did, ironically, hint at the elusiveness of this commonly used term: creativity. Taylor and Getzels alluded to the idea in the opening pages of Perspec-

tive in Creativity that definitions of creativity said too much and too little and were often misleading. Among the definitions found in the literature:

"The most common definition of creativity focuses both on the product and the process: Creative ideas (the products) are seen as new combinations of previously unrelated ideas or looking at it another way, new relationships among ideas" (Davis, 1981, p. 6).

> The term 'creativity' was principally used to mean activity resulting in contributions that have novelty and value in the intellectual sphere of human experience ...in all such contexts, 'creativity' universally implies a departure from, and advance beyond, what is conventionally attainable (Kagan, 1967, p. 92).

Stein believed that creative work was a novel work that was accepted by a significant number of others at some point (Stein in Parnes, 1962).

"Actual creativity I define as the process of bringing something new into birth" (May in Anderson, 1959, p. 55).

"My definition, then of the creative process is that it is the emergence in action of a novel relational product, growing out of the uniqueness of the individual on the one hand and the materials, events, people, or circumstances of his life on the other" (Rogers in Anderson, 1959, p. 71).

> ...the essence of the concept of creativity is the fundamental notion of the "aha" - meaning the fresh and relevant association of thoughts, facts, ideas etc., into a new configuration, which pleases - which has meaning beyond the sum of the parts - which provides synergistic effect" (Parnes, 1975, p. 5).

"Creativity, in the final analysis, is a function of the transactional relationships between the individual and the environment in which he lives" (Stein in Parnes, 1962, p. 91).

Anderson provided still another glimpse into the scope of definitions regarding creativity when he said: "For Sinnot - creativity is life itself. For Dow, it is a way of life. For Anderson, it is optimum growth in social interaction. For Maslow, it is a maximum of self-actualizing" (Anderson, 1959, p. 237).

And for Dewey it was simply: "the esthetic experience" (Dewey in Parnes, 1962, p. 106).

Most definitions, whether focusing on product and process or product or process implied that creativity involved the development of something unique. Earlier, Spearman defined creativity as "the power of the human mind to create new content - by transferring relations and thereby generating new correlates" (Taylor, 1975, p. 2).

Spearman's definition contained the seeds of the major hypothesis of the researcher: that creativity is linked to the transfer of learning. However, other definitions provided the added dimensions necessary for the formations of a comprehensive concept of creativity.

While these examples provided an overall "sense" of this concept called creativity, according to Taylor, the theories that have been developed should also be examined (Taylor, 1975). For this analysis the existing theories of creativity were scrutinized.

Theories of Creativity

While Taylor and Getzels (1975) separated these systematic approaches or theories under the headings: Psychoanalytic, Humanistic, Trait-Factorial, Holistic and Associationistic, this researcher selected different conceptual lines. Generally as scholars and research-

ers struggled to grasp the elusive concept called creativity, their approaches seemed to fall into four perspectives.

The four categorizations used most frequently to define creativity: 1) delineating personality traits, 2) grasping a holistic, Gestalt view, 3) analyzing factorial elements or 4) examining creativity as a process. To give comprehensive exposure to the findings, each of these four approaches was presented for review.

Theory of Personality Traits

The roots of creativity research were rooted in the field of psycho-analytic studies of behavior and personality. In fact, Freud (Taylor, 1975) was one of the earliest scholars to suggest a dynamic theory of creativity. He postulated that the creative process originated within the person and creative production mirrored unconscious imagery as overt manifestations of sublimation.

Freud's writings became catalysts to Adler, Jung and Rank who subsequently offered variations to Freud's formulation. Jung emphasized the idea of the collective unconscious and creativity as man's striving toward individuation, while Adler's focus was on the uniqueness of each person. Adler believed that compensation for inferiorities led to creative achievement. He departed from Freud and Jung with the distinction that creative behavior came from the conscious, not the unconscious. Rank, on the other hand, was more concerned with art and creativity, with the premise that artistic achievement was a result of an individuals highest level of achievement in realizing an independent will (Taylor, 1975).

Yet another psychoanalyst, Laurence Kubie believed that creativity occurred between the conscious and the unconscious, in the area Kubie called the preconscious (Davis, 1981). This was the state where "day dreaming" and "incubation" occurred.

In 1952, Kris developed yet another psychoanalytic position by stating that free interplay between the preconscious and the conscious was necessary for creativity. He referred to this as "regression in the service of the ego" (Taylor, 1975, p. 8).

Maslow, on a more humanistic thread, believed that the creative person overcame his fear of self and balanced both childlike qualities and maturity in a self-actualizing process. Agreeing with Maslow's concept, Rogers stated that creativity appeared to be "man's tendency to actualize himself, to become his potentialities (Taylor, 1975, p. 8).

Rogers added several important conditions for creativity in terms of self-actualization: psychological safety, internal locus of evaluations, willingness to toy with ideas, to play with new possibilities and openness to experience. Along this same line of thought, Fromm spoke of a readiness for creativity as one reaches some degree of inner maturity and becomes self-accepting. Riesman, May, and Allport also embraced the concept of self-actualization as a motivating force in releasing creativity (Taylor, 1975).

Although Freud and his disciples regarded creativity as erupting from a psychopathological source, while Maslow and others saw creativity rooted in man's healthy self, the evidence in both areas remained sketchy.

A behavioristic viewpoint is presented by Mendick in which he developed a theory of mental associations. He differentiated between highly creative and less creative persons suggesting that the highly creative person appeared to have a greater number of verbal and non-verbal mental associations (Davis, 1981).

Still others described detailed listings of personality characteristics and traits. Barron, MacKinnon, and Taylor described characteristics to isolate creativity as an identifiable entity: observant, often expressing half-truths, seeing things as others do, but also as others do not, independence in their cognition, ability to hold many ideas at once, more vigorous constitution with an exceptional kind of psychic and physical energy, a more complex personal universe, more contact with the life of the unconscious and with fantasy, reverie, and imagination (Barron in Parnes, 1962).

Smith, in turn, identified some negative characteristics: stubbornness, resistance to domination, indifference to conventions, uncooperativeness, assertiveness, cynicism, sloppiness, questioning rules and authority, temperamental attitudes and a withdrawn stance (Davis, 1981).

Calvin Taylor, also, outlined an extensive listing of characteristics but with more positive connotations: ability to sense problems, capacity to be puzzled, keen observation skills, awareness of when you don't know, an ability to sense ambiguities and pose effective questions, curiosity in action, a devotion to autonomy, self-sufficiency and independence of judgement, open to the irrational in themselves,

yet stable and capable of taking greater risks in the hope for greater gains, feminine in interest and more dominant, self-assertive, more complex, more self-accepting, more resourceful and adventurous, more radical and more controlling of their own behavior through self concept (Taylor, 1975).

Anderson, too, adapted the system of attributes of creative persons: desire to grow, capacity to be puzzled, awareness, spontaneity, love of flexibility, persistent, hard working, differentiation, divergent thinking, open to new experience, yielding, discarding the irrelevant, differentiating, integrating, being at peace with the world, honesty, humble, enthusiastic, with an inner maturity and self actualizing quality of boldness, faith, and courage (Anderson, 1959).

Guilford also referred to the creative personality as a matter of those patterns of traits that are characteristic of creative persons. A creative pattern, according to Guilford, included such activities as inventing, designing, contriving, composing and planning (Guilford in Parnes, 1967).

Still other researchers delineated personality characteristics of creative people differently. Gough listed five factors that had fundamental importance in identifying underlying personality and motivational factors which predisposed toward original thinking: intellectual competence, inquisitiveness as a habit, cognitive flexibility, esthetic sensitivity, and a sense of destiny (Parnes, 1962).

MacKinnon cited Kluckhohn and Murray's delineation of the creative man which suggested that every man was in certain respects a)

like all other men, b) like some other men, c) like no other man (MacKinnon in Kagan, 1967).

Gough was also cited in MacKinnon. Gough's eight types of scientific researchers: (1) the zealot, (2) the initiator, (3) the diagnostician, (4) the scholar, (5) the artificer, (6) the aesthetician, (7) the methodologist and (8) the independent were types ranked for their creativeness in the scientific researcher setting. Gough placed the methodologist and initiator at the head. MacKinnon suggests a plausible premise: "In our minds should be a reminder that the criterion of creativeness is as bound to the situation in which creative behavior occurs as is the behavior itself" (MacKinnon in Kagan, 1967, p. 24).

Biological factors were also considered in theories of creativity. Schaefer found that creative high school students often had lived in more than one state, were likely to have older and younger friends, rather than the same age, and often reported having an imaginary playmate (Davis, 1981).

While these psychological studies provided the historical perspective on creativity and addressed the personality and behavior associated with it, this field did not offer a clear definition of the term itself. Creativity was recognized and discussed as a dynamic phenomenon, but the focus of discussion leaned toward the personality states that released it, rather than an in depth look at what creativity actually was.

Gestalt Theory on Creativity

Following another line of thought, a Gestalt or holistic point of view envisioned creativity as "insight." For Duncker, Kofka, Wer-

theimer and Lewin. the whole situation involved the self and the world. Other holistic investigators, Schachte and Armjeo, also related creativity to an openness to perceptual experiences (Kagan in Taylor, 1975, p. 2).

The Gestalt psychologists defined creativity as an action that produced a new idea or insight through imagination rather than through reason or logic. Thurston similarly assumed that creativity is crystalized by the instant of insight. As early as 1900 Ribot described creativity as a process of association by which mental states become joined together (Kagan in Taylor, 1975).

Again, in this school of thought, as in the psychoanalytical view of personality traits, the leading authorities addressed the process of creativity rather than projecting a usable definition of the term. However, both perspectives helped provide the early foundations of creativity as a viable concept to investigate further.

Analytic Theory of Creativity

Factorial theory differed from the previously noted approaches to the discussion of creativity. In this perspective, traits were statistically factored out to isolate separate intellectual elements. Galton first proposed a theory of mental capacities transmitted genetically in the study of eminent men. Cattell and Spearman also looked at innate characteristics and their relationship to creativity. Thurston and Roe questioned the comprehensiveness of intelligence tests in regard to measuring creativity as the elusive factor (Taylor, 1975, p. 9).

Yet, the most notable proponent and the man most often cited for his contribution in the area of this trait-factorial approach to crea-

tivity was J. P. Guilford (1959). Resulting from his work was a structure of the intellect model in which divergent production or creative, productive thinking, took on major dimensions.

Imbedded in Guilford's theory were two premises: creativity was different from intelligence and creativity had multiple dimensions. His model considered: sensitivity to problems, fluency, flexibility, spontaneity, originality, redefinition and elaboration.

Lowenfeld and Getzels and Jackson followed Guilford in their belief that creativity was one factor of intelligence (Taylor in Parnes, 1962). Also, properties of unusualness, appropriateness, and transformation were stated by Philip W. Jackson and Samuel Merrick as factors of creativity (Jackson in Kagan, 1967).

E. Paul Torrance, known in the field of creative studies for "The Torrance Test of Creativity," identified similar elements in his analysis of creative behavior. His test required proficiency in fluency, flexibility, elaboration and originality to extract a profile of creativity (Torrance, 1962).

Gardner, in his book Frames of Mind proposed a theory of multiple intelligence that was currently receiving much attention. Again, he was looking at factorial elements, although he viewed the entire realm of intelligence, not just creativity. He delineated several, different intelligences:

1. Linguistic Intelligence
2. Musical Intelligence
3. Logical - Mathematical Intelligence
4. Spatial Intelligence
5. Bodily - Kinesthetic Intelligence
6. The Personal Intelligences.

His perspective on creativity was related to forms of intuition, pattern seeking, and common sense that crossed into all the intelligences hypothesized (Gardner, 1983).

The Process Approach to Creativity

Perhaps the most useful and most currently accepted approach to creativity was to examine the mental processes involved in creativity. The historical foundations of describing the process of creation was introduced by the mathematician, Poincare. Wallas, in his 1926, The Art of Thought was attributed credit for identifying four stages to the formation of creative thought: preparation, incubation, illumination, and verification. Patrick (1955) investigated the stages identified by Wallas and elaborated on these in her work, What Is Creative Thinking?. According to Patrick, in the first stage of preparation the creative thinker "loaded up" information. This stage was deliberate or nondeliberate. Patrick believed that a trait of a creative thinker was his ability to combine and apply experiences that ranged over various times and with diverse purposes (Patrick, 1955).

In the second stage, when the mind was no longer intent on the problem, the consciousness had relaxed, a time of incubation set in. This was followed by a stage called illumination in which an idea grew, attaching itself to neighboring ideas and becoming an overriding concept which could not be resisted (Patrick, 1955).

Finally, a fourth stage of verification or revision arrived. During this time, critical examination of the idea resulted in refinement and verification. Patrick also noted that these stages did not always occur separately or sequentially, but overlapped and inter-

twined. Patrick, Abelsom and Kagan, and Youtz in Parnes (1962), also referenced Graham Wallas' four stages in their work. Fabun added three stages to the Wallas' model: desire, preparation, manipulation, incubation, intimation, illumination and verification (Davis, 1981). Alex Osborn, on the other hand, spoke of two stages: Stage 1 - Green light and Stage 2 - Red light. In the green light stage, one let his imagination soar and then became judicial in the red light stage (Parnes, 1962).

Yet Gough (Parnes, 1962) cautioned that the orderliness and symmetry implied by stages was the inherent weakness in the theory of stages. "Imaginative thinking seems in truth to be much more characterized by disarray, complexity, ferment, and turmoil. Processes overlap, ebb and flow and intermix to an extent scarcely compatible with notions of fixed stages and sequence" (Gough in Parnes, 1962, p. 214).

Parnes (1962) further developed the process theory by using Osborn's work on "brainstorming" to conceive a creative problem-solving model which included: Fact-finding, problem-finding, idea-finding, solution-finding and acceptance-finding. Again, the focus for defining and understanding creativity fell on the steps imbedded in the process. Some researchers saw creativity as the process of changing perceptions. Gordon (Parnes, 1962) devised approaches to facilitate the creative process of changing perception, called "synectics." It was based on metaphorical thinking. Using pattern perception as his theoretical base, deBono also developed a method which he called lateral

thinking to enhance perception and help shake up the known patterns of perception (de Bono, 1976).

Torrance defined stages in creativity as:

> the process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on; identifying the difficulty, searching for solutions, making guesses or formulating hypotheses about the deficiencies, testing and retesting these hypotheses and possibly modifying and retesting them, and finally communicating the results (Torrance in Kagan, 1967, p 73).

Similarly, Perkin's viewed creativity as a process and looked at the interrelationship of concepts currently under study in contemporary psychology: "The concept of pattern recognition, the concept of search through a space of alternatives, the concept of schema, findings on the role of fluency in creative thought, on process of incubations in problem-solving and efforts to teach problem-solving" (Perkins, 1981, p. 4).

Sternberg, cited in Dillon and Sternberg (1986) described a set of processes he calls metacomponents which seemed to reflect the cognitive activities which individuals used as they prepared to perform intellectual tasks. It is understood that these tasks included creative ideation (Dillon, 1986).

Viewing creativity from a process theory provided a fruitful base for examining this elusive phenomenon. The research revealed again, much diversity in orientations, but the common threads outlining the stages seemed to emerge in many of the theories.

The final piece of research literature that fit directly into the puzzle of this study concerns the relationship between creativity and a sub-group of adult-learners, teachers.

Creativity and the Teacher

To investigate the research addressing creativity and the teacher, the body of literature inevitably led to the educational setting itself. According to Hahn in Creative Teachers: Who Wants Them?, the educational setting not only did not promote creativity in teachers, but actually worked as a negative force in accepting creative faculty. Hahn lamented his personal experience in this way:

> I was a CT - a Creative Teacher. ...then the noninstructional red-tape curtain fell. If I wanted to take my students on a field trip, I had to fast-talk the superintendent in charge of finance. When I attempted to introduce controversial topics such as economics or equality or racial discord or sex ...into the curriculum, the subject-matter supervisor discouraged me. If I requested permission to assign a novel that depicted modern teenage life realistically, the department chairman said, "Forget it!" I am no longer the creative teacher I once was (Hahn, 1973, p. 1).

Yet, evidence of a passionate plea by a young student for just that kind of creative teacher was noted. Profiled in Learning Together, Drews recorded a student's thoughts that suggested that we needed teachers who were passionate about their knowledge and used that knowledge creatively. Teachers, according to this student, should infect students with their enthusiasm (Drews, 1972).

There is further evidence of the reality depicted by Hahn and Drews. Torrance examined the creativity research in education in the 70's. In his opening comment he suggested that others felt that creativity research in education seemed to be a dead issue and that Torrance should shift his research to something that would make more of a difference in education (Torrance in Taylor, 1975). Torrance felt that future teachers would not understand that the skills of creative thinking are teachable (Torrance in Taylor, 1975).

Rogers suggested a similar concern but with a focus on the social need. He felt we turned out those who were neither conformists nor stereotypes, those individuals whose education was completed; but not freely creative and original thinkers (Rogers in Anderson, 1959).

Although Roger's assessment of "a dearth of creativity" was somewhat accurate according to the literature, a steady interest in creativity rooted in the early 50's was still evident. Maslow's advanced reformulation of ideas in his work in psychology suggested that the word 'creative' be applied to many products other than the standard and conventionally accepted poems, theories, novels, experiments, or paintings. Young athletes, performing a perfect tackle could be as aesthetic a product as a sonnet and could be approached in the same creative spirit. These people were all integrators, who could put separates and opposites together into unity (Maslow in Anderson, 1959).

From these early studies and emerging theories, the definition of creativity moved from a focus on the conventionally accepted notion of creativity and the "artist" to a broader perspective, touching all humankind. If this remained a truer picture of creativity, Maslow's portrait of the self-actualized creative person - as related to education and the teachers - presented a hopeful view.

Maslow believed that self-actualizing creativeness is emitted, much like radioactivity and permeates the world around it (Maslow in Anderson, 1959).

Thus, creative teachers would yield creative students. Maslow's message was encouraging in the broadest way, but Stoddard did not see creativity happening in the educational realm. He suggested that

creativity was close to being lost in American education with petrified versions of teachers and textbooks (Stoddard in Anderson, 1959).

Although it was thought at the time that this adherence to conformity made little difference in mathematics, physical science, and grammar, some believed that the years of standard instruction in these disciplines had produced populations who relied on the conditional response, the repetitive act, the voice of authority (Stoddard in Anderson, 1959).

The "Sputnik panic" which caused a sudden interest in developing the talents of our gifted children with vast amounts of federal funding, perhaps missed the real key to a secure and prosperous future that seemed hidden in the Russian philosophy of education.

Upon viewing children's drawings from 34 nations, the work of the Russian children seemed to show unusual spontaneity and creative work. Lowenfeld asked a member of the Russian delegation why early indoctrination of political aims was not evidenced in the children's art. The man referred to a model in which the child's creativity was unfolded first, giving him as much freedom as possible. Fixed pattern workbooks were not used. Then, once creativity was unfolded, it was channeled and disciplined. The implied understanding that the Russian suggested was that once developed, creative qualities will be brought to any work (Parnes, 1962).

If this premise applies universally to all persons, creativity unfolded in teachers would touch their work in fundamental ways. Ironically, as far back as 1950, Guilford stressed that a comprehensive

learning theory should address both insight and creativity (Guilford in Parnes, 1962).

This learning theory was exactly what this study was investigating. How did creativity affect learning and transfer of learning into life skills? Establishing the emerging recognition of creativity and value of creative thinking in education, evidenced in the literature, was seldom bridged directly to the teachers. Most often it related to how the teacher might foster the creative talents of the students. But some of the authorities alluded to the obvious thinking that creative teachers understood that first they must please themselves (Hahn, 1973).

In order to teach creativity, the teacher must teach creatively. In order to teach creatively, the teacher must, just as with the Russian students, unfold their own creativity. Why did some teachers exhibit this "unfoldness," this creative sense, while others seemed to have "closed-up" or shut-down their creative mechanisms? What were the types of teacher-learners and why were they so different?

Both Drews and Brown have attempted to look at teacher-learner types. Drews depicts three types of teachers: The social teacher with a success orientation, the standard teacher with a professional orientation, and the self-actualizing teacher with a creative intellectual and empathic-altruist orientation (Drews, 1972).

For Drews, the self-actualizing teacher was a rare reality. She made a strong statement about why these creative types may be a rarity in her discussion of institutions. Schools were not made for those who aspired to self-actualization, according to Drews. Creative intel-

lectuals still resisted the inevitable prison of constraint that was surrounded by law and dogma, rules and regulations (Drews, 1972).

Drews portrayed the creative teachers as continuously innovative, with concern for what premises were beneath the change, typically working beyond textbooks and curriculum. In their search, they took risks - tried the untried, explored the unverifiable, asked the unanswerable. "The self-actualizing teacher ... saw himself as a learner, seeking truth just as the student did and critically reevaluated his own beliefs" (Drews, 1972).

Brown related attributes of creativity to the teacher-scholar with a listing derived from years of evaluating creative teachers:

> (1) an inquiring mind, (2) the power of analysis and accumulation, (3) the attribute of intuition, (4) self-discipline, (5) a tendency toward perfectionism, (6) a tendency toward introspection, and (7) a tendency to resist external authority (Brown in Kagan, 1967, p. 164).

However, Brown cautioned that this was only an arbitrary listing: "When a mixture of attributes developed over a whole life span was involved, the problems of validation become enormous. Few people could understand or remember just how they had become what they were" (Brown in Kagan, 1967, p. 164).

So, too, as one tried to classify teachers in particular learner-types, Whitehall's cautionary note was embedded in Drew's work: If it seems too simple, then distrust it (Whitehall in Drews, 1972).

Yet, the categories and characteristics did provide viable paths to pursue in the study of teachers as learners. Hahn (1973), Drews (1972), and Davis (1981) expanded on their observations by offering notions about how teachers got that way. Their views on this would

have bearing on this study of the relationship between creativity and the transfer of learning in adults.

The majority of adults seem encased in walls of conformity built in their education years, is a theme Drews wrote about. She believes that for students to be introduced to human aspirations and hopes - teachers would have to first embrace these possibilities (Drews, 1972).

Drews (1972) felt education students must be given the kind of education that helped meet their own emotional and social needs. This researcher suggested the same was true of teacher education at all stages, including training in staff-development that provided opportunities toward self-actualization.

Based on this same line of thought, Davis extended the concept by presenting a model for creative development which described a) the process of becoming a more creative adult, b) an instructional sequence for teaching creative development. The model included an awareness of creativity, an understanding of the nature of creativity, techniques for creative production and a humanistic increase in the actualization of one's potential.

Hahn (1973) also developed a plan of action toward motivating teachers to reach their creative potentials by taking a leadership role in administration. Instead of hassling the creative teacher, he vowed to accept, share, and stimulate creative energies in his school.

In retrospect, the connections between creativity and the teacher were evidenced, if sparsely and somewhat inconsistently in the literature. But a definite bridge between the teacher-as-learner and the role of creativity was only a scant structure at this point in time.

Summary: Transfer and Creativity

After reading volumes of scholarly information on transfer and on creativity, it appears that there was a degree of consensus on the concept of transfer. However, it seemed that even the experts could not agree or fully grasp the concept of creativity. Yet, even the most simple-minded man knows when something is creative. In fact, it has been noted that a truly creative idea, once found, seemed obvious; the paradox was, of course, the simplicity of the complex.

Based on this final notion of creativity and embracing Spearman's concept of "the power of the human mind to create new control by transferring relations and thereby generating new correlates," (Taylor, 1975, p. 2) the theoretical bases for study were made. From this perspective, the role creativity played in transfer was examined in adult learners.

CHAPTER III

METHODS AND PROCEDURES

> We need, that is, both a way of passing from naked propositions and their logical connections to the human activities that give them their sense, and beyond those activities to the features of the world and human life within which they are at home; and also a reverse road, back from 'form of life' in the world to the specific activities in question, and so eventually to the original propositions again (Eisner, 1979).

In an attempt to fully outline the methods and procedures used in this study; "From Training to Transfer: The Role of Creativity in Adult Learning," this section began with the research questions that were addressed. Discussion of the actual research design followed. Concluding this chapter, procedures used for defining the sample, collecting the data, and verifying methods were addressed as well as a discussion of how the findings and conclusion were to be reported.

Research Questions

As a teacher trainer, this researcher conducted comprehensive, five day programs for K-12 teachers in cognitive strategies for classroom instruction. The training fell into an instructional category currently referred to as thinking skills. The training was called "Patterns For Thinking" and was an eclectic model in a cognitive/process approach to classroom instruction. The training followed the guidelines of Joyce and Showers' recommendations for effective inser-

vice trainings. The participants were exposed to the theories of intelligence that drove the program. The skills were modeled and practiced in the training. Transfer lessons and bridging techniques were discussed. The sessions were scheduled several weeks apart. In the time between sessions, peer coaches and peer coaching teams with the principal or department head acting as team leader, worked together to plan, practice, and try out the skills and strategies presented during the training and provide feedback and support.

Subsequent sessions began with sharing and feedback on the practiced skills and strategies. Participants also used a training log throughout the program. This log was designed to provide reflection to the learnings presented in training. Teacher participants were guided to use the log as a method of modeling metacognitive processing techniques for reflection and self-analysis. They were encouraged to log "success stories," questions, barriers and benefits, ideas and notes concerning the training and their personal reactions to it.

From this training, and over time, certain learner-types (or learner stages) emerged. To summarize the types that have been previously described in this paper, the five conceptual bins, represented in metaphorical measures, were outlined:

(1) Head-in-the-Sand Ostrich: Does-nothing; unaware; the shot doesn't take; there appears no evidence of use of skills or strategies.

(2) Drilling Woodpecker: Practices exactly as modeled; no more; no less; one or two short pecks.

(3) Look-alike Penguin: Applies skills and strategies appropriately in one narrow area of content; does not explore new application areas; uses a generic template but in only the one area.

(4) Carrier Pigeon: Generalizes skills and strategies and bridges into various content situations; varies application; carries ideas into new areas.

(5) Soaring Eagle: Extrapolates essence and innovates beyond skills and strategies presented; senses no boundaries or limits; free form; innovates.

The research questions that emerged were rooted in these learner categorizations that seemed to recur in the training setting.

1. Why did some teachers "leap to transfer and beyond?"
2. What role did creativity play in this seemingly effortless and often spontaneous transfer of learning?
3. Did patterns emerge in the "Learner Type 4 and Learner Type 5 categories?
4. What was the connection between creativity and transfer?

A brief elaboration of each question followed.

Why did some teachers "leap to transfer and beyond? Were these personality types that were predisposed to grasp the learning in meaningfully relevant ways? Did childhood experiences and educational background play a role? Were school cultures and climate determining factors? Was the key classroom experience or content expertise? Was this "leap to transfer and beyond" recognized as a typical response for the particular learners under study?

What role did creativity play in the transfer of learning? Why did some teachers "make connections" more easily than others? Were there characteristics that were not only identifiable but "growable?" Could we grow creativity and if so, would that promote transfer of learning?

Did patterns emerge in the learner categories of Type 4 and Type 5 learners? What were the threads that could be identified? Did commonalities emerge about learners who seemed to absorb learnings in practical, useful ways? Were there patterns that emerged in these learners? If so, how could that information help promote transfer of learning for others? What were the implications for staff development programs and inservice designs?

What was the connection between creativity and transfer? Was there a connection between creativity and the patterns of the Type 4 and Type 5 learners? Did creativity enhance transfer? If so, how? And if the "how" became obvious or even suspected, what changes were indicated for more effective teacher trainings?

Research Design

This research was designed as a case study of five individuals. The study examined the behaviors of adult learners who seemed able to bridge and innovate new learnings from staff development training into relevant and meaningful teaching methodology. The explicit purpose was to find patterns of behavior that evidenced transfer and innovation and to describe that behavior. Once that evidence was clear, the task became one of interpreting and relating the information gathered for

each case under study and to extrapolate the patterns of similarities from the different tapestries.

This researcher examined five cases to seek a thread of commonality regarding creative transfer of learning that could be identified and subsequently worked with more skillfully in adult trainings. Each case was analyzed for this suspected thread to document if a relationship between creativity and transfer of learning really existed and if there was a way to find that relationship in order to examine it microscopically.

The research design selected for this study was a pure qualitative, case study. The purpose of the study was to look, in depth, at particular learners who seem most likely to creatively transfer new learning. Ryle in Geertz (1973) supported the notion that thick descriptive narrative allowed one to examine fully the intricacies of human interactions. Factoring numerical notations and analyzing quantitative data seemed inappropriate to the questions asked in this study and fell far short in yielding the kind of meaningful information this researcher sought.

However, that was not to say that verification and reliability was lost to an esoteric descriptive piece. Procedures for analysis and verification were inherent in the design. Yet, it seemed that carefully analyzed, well written case studies would yield the depth of understanding described by Eisner (1979) as educational connoisseurship.

What was involved in the development of educational connoisseurship was the opportunity to observe educational life in a focused, sensitive, and conscious way. It required the opportunity to compare

such happenings and to discuss what one saw so that perceptions could be refined, to identify events not previously perceived, and to integrate and appraise what had been seen.

Criticism is the public side of connoisseurship, according to Eisner. "...What critics do ...(is) create a rendering of a situation, event, or object that will provide pointers to those aspects of the situation, event, or object that are in some way significant" (Eisner, 1979, p. 197).

A justified "one-shot" case study was selected: one school, one training, one point in time, individual teachers. The sample of five individual cases were identified in the 1987-88 "Patterns For Thinking" training at a suburban high school in an affluent community. The Director of Staff Development for the district had agreed to cooperate and participate in this study. Both the building principal and the assistant principal in charge of instruction at the high school supported the study and agreed to cooperate and facilitate the process of selecting participants.

Sample

Time considerations and thoroughness of data collection have led to the choice of the five case samples. In order to allow sufficient time for observations, interviews, analysis and writing, five cases seemed manageable. In addition, by selecting five individual teachers, the numbers seemed sufficient for comparative analysis in the search for emerging patterns or threads of commonalities.

In the selection of five cases for the sample, background information as well as personality characteristics was of interest to the

researcher, as well as teaching experience and skill level. The five teachers were selected through a nomination procedure. Key school personnel, participating teachers and the trainer nominated teacher trainees for the study. Teachers were selected through a five-pronged nominating process.

The nominations for the five cases were made separately and without consultation with others, by the principal, assistant principal, staff development director for the district and the trainer. In addition, participants were asked to self-nominate.

The criteria for nomination were characterized by broad guidelines. The people making the nominations were instructed to nominate teachers in the training who seemed most likely to make creative transfer of the learned skills. Consideration of the following factors were stressed:

(1) evidence of transfer in previous trainings and inservice situations

(2) personality dispositions of openness and willingness to risk

(3) professional status of classroom teacher exclusive of department heads.

Based on the above noted criteria, the five names nominated most frequently through the independent ballot process described, became the sample cases for the study.

The rationale for selecting candidates for the study by a nomination procedure rested on several basic considerations. Of primary concern was the knowledge that any analysis of the teaching act unveils

an intricate web of complexities. Joyce and Showers report that "all studies that have successfully differentiated more and less effective teachers have reported that effectiveness is the product of a complex set of behaviors, rather than the use of a few practices" (Joyce & Showers, 1988, p. 51). To focus on the role of creativity in the classroom transfer of cognitive skills and strategies by teachers, was a highly complex task in itself. A random sample would have created still more complexity since the randomly selected sample could theoretically have been void of the target Type 4 and Type 5 learners. Since the focus of the study was on teacher trainees most likely to make creative transfer, an initial screening process such as nominations based on predetermined criteria seemed appropriate to the study purpose. The screening was to increase the chances of isolating the Type 4 and Type 5 learners.

A second overriding factor supporting the nomination screening procedure was the time involved in the data collection. In order to study the selected cases in depth, extensive on-site observation was required. Classroom observation required substantial time and effort commitment from the school personnel involved. Coordination and logistical concerns as simple as visitation scheduling became major obstacles for the school staff to manipulate. In addition, to keep the overriding psychological/emotional factors regarding participant anxiety and increased levels of concern about the observations at a minimum, an initial screening seemed to insure the least intrusive approach. At the same time, the nomination procedure seemed to provide both efficiency and consideration for the subjects of the study by

avoiding unnecessary obstacles. There were enough obstacles already in the case study design. The researcher attempted to neither burden the school with unnecessary scheduling nor obscure the focus of the study with inappropriate candidates.

A third consideration supporting a nomination procedure for initial screening was the reliability factor. On-site participant-observers who have known the participants over time and have ascertained a full profile of the teacher's professional expertise provided invaluable information and insight to the researcher (Becker & Geer, 1957). To parallel an analogy, the classroom teacher has a full, rich perception of the total child that is initially shared with the visiting psychologist or social worker who may have only had cursory meetings with the child.

Finally, further rationale for the nomination process was rooted in real-life practice. Frequently, teachers selected for training were appointed for the training. The selection was based on the professional judgement of the principal or assistant principal. Also, the district staff development person was often involved in trainee selection.

In this study, the staff development director worked closely with the high school. In addition, she had participated in a previous district training of Patterns For Thinking, so she was familiar with the content and material as well as with district teachers' reactions to the training.

Also, regarding teachers' self-nominations, the literature supported voluntary application for training as a positive factor in

educational change (Joyce, 1988; Fullan, 1982). In fact, both studies cited suggested that voluntary inclusion was a critical component for success and transfer in adult learners.

Data Collection

The data gathering included a combination of strategies: participant observation, notetaking, coding, logging, interviewing and artifact collecting. Both observer and methodological triangulation (Denzin, 1978) was utilized in order to test the reliability of the observations made in the classrooms. Each of the above mentioned strategies served a particular purpose.

Observation and Notetaking

Participant observation and notetaking was the primary source of data collection. Participant observation was supported by Becker and Geer (1970) who note that the professional relationship facilitates rapport and researcher credibility. By combining participant observation with building administrators' observations, a modest attempt at observer triangulation was achieved.

Triangulation

Triangulation was a technique used by the researcher to try to establish verifiable findings through the use of separate, multiple approaches. Denzin (1978) defined the term triangulation as "the combination of methodologies in the study of the same phenomenon."

In this study, observer triangulation was attempted by using both the principal and the assistant principal as additional observers. Although unable to commit fully to the researcher's observation sched-

ule, both building administrators agreed to discuss and compare the researcher's observations with their instructional observation data on each participant. While not providing the observer triangulation as described by Miller (1988), this methodology did provide some degree of observer verification.

Within the participant observer strategy, classroom observations, during both the fall and spring semesters, were scheduled with each of the five teachers involved in the study. These observations were primarily in the classroom during instructional time, but pre and post observation sessions were scheduled as well as time for the informal interview.

The purpose of classroom observation (Bogdan & Taylor, 1975) and notetaking was to provide a primary source of evidence regarding the transfer of learned skills and strategies into personally relevant classroom situations. The power of handwritten field notes was acknowledged in detail by Miles and Huberman (1984) as a critical tool in ethnographic research. "In all cases we are focusing on words as the basic form in which the data are found" (Miles & Huberman, 1984, p. 50). Eisner (1979) also stressed the importance of on-site immersion and description as an initial phase of qualified educational criticisms.

> The descriptive aspect aims at the vivid rendering of the qualities perceived in the situation. The interpretive attempts to provide an understanding of what has been rendered. ...The evaluative aspect ...attempts to assess the educational impact or significance of the events... (Eisner, 1979, p. 211).

Data analysis became an integrated part of the notetaking phase to comply with the crucial interactive nature of qualitative research. Miles and Huberman (1984) supported this methodology.

> Analysis during data collection lets the fieldworker cycle back and forth between thinking about the existing data and generating strategies for collecting new - often better quality - data; ...the ideal model for data collection and analysis is one that interweaves them from the beginning (Miles & Huberman, 1984, p. 49).

This methodology is also advocated by Eisner (1979). He saw the opportunity to attend to classroom happenings in a focused and sensitive way and the opportunity to compare such happenings, to discuss, to integrate and to appraise what has been seen as interwoven elements in the data gathering process.

Coding

Coding (Lofland, 1971; Bogdan & Taylor, 1975; Bogdan & Biklen, 1982), another procedure in the data collection phase, was an analysis tool used throughout the study. Although lengthy written notes enabled "thick description," as Geertz (1973) suggested, they soon became cumbersome to manage. Coding provided a way to classify or categorize the ideas presented in written notes. Codes were described by Miles and Huberman (1984) as "retrieval and organizing devices" that help the researcher "cluster" related segments (Miles & Huberman, 1984, p. 56).

Lofland in Miles and Huberman (1984) suggested that codes could deal with phenomena from the microscopic to the macroscopic levels. These levels could be static or dynamic. Bogdan and Biklen in Miles and Huberman (1984) divide codes into categories. Among the coding

concepts they used were setting/context, process, events, strategies and relationships.

Miles and Huberman (1984) described three types of codes: descriptive, interpretive and explanatory. Descriptive codes simply placed the phenomena into a category within the text, while interpretive codes attached some sense or understanding beyond the categorical label. In turn, the explanatory coding became even more inferential, linking the incident to an emerging theme or pattern. Kaplan (1964) suggested that as one goes beyond the codes toward understanding, patterns or "repeatable regularities" could become key.

For the purposes of this study, Glaser's (1965) constant comparative model of analysis dictated the definitive procedure for on-going coding throughout the observation phase to not only manage the data, but to analyze and verify the data as well. Since the constant comparative model was the primary analysis and verification methodology used in this study, a detailed discussion of the procedure appears later in this chapter.

Observer Log

Combined with on-site observation, note-taking, and coding, an observer's log was used by the researcher. The log differed from the observation notebook. Whereas the observation notebook took on the form of scripting and describing in detail the actual observations, the log was used to analyze and question and synthesize, in reflective evaluation, the observations recorded.

The log served as an intermediary step between the observation and the memoing technique used in the constant comparative analysis.

The log ultimately became a primary vehicle to drive the study and the findings. The reflective thinking by the researcher, apart and separate from the "front line" observation, led to more precise analysis in the memoing phase of analysis by providing a "mental conversation" about the observations. Both Eisner (1979) and Glaser (1975) noted the importance of discussion and comparisons during the data gathering. Although they did not refer to "mental conversations" per se, it seemed a viable alternative to incorporate.

Informal Interviews

A further procedure that was used to collect data and also to provide the methodological triangulation (Denzin 1978) for internal reliability was the interview strategy. The researcher interviewed participants in the areas of background information and self-perceptions.

With permission from participants, informal interviews were held with supervisors, peer-partners, other faculty and students. The purpose of these "second-party" interviews was to provide additional perceptions of the teachers in the study in order to develop full and rich profiles of the teacher participants.

The format for these interviews was informal and open-ended in nature. According to some authorities (Becker & Geer, 1957; Patton, 1980) this open-ended format provided flexibility which is considered unobtrusive. See Appendix E and Appendix F.

Although the questions were few in number, the purpose was to invite free-flowing conversations that focused on the teacher and creativity. These interviews provided peripheral information and per-

ceptions that sharpened the emerging profile of the teachers in the study.

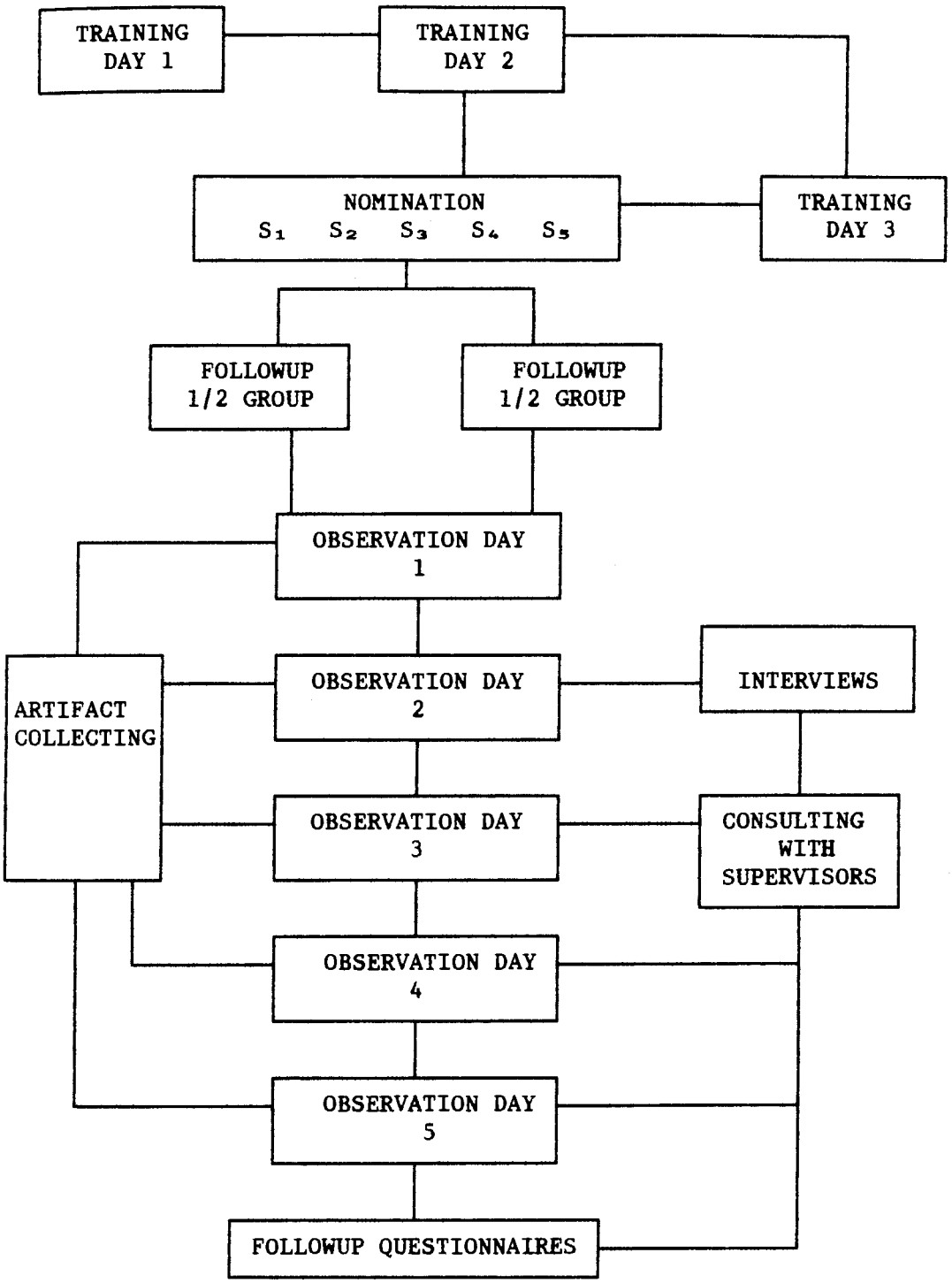
Also, to guard against unwarranted anxieties, over-loaded schedules, excessive intrusions and other peripheral pressures, informal sessions with participants at lunch or during breaks, served as periodic pressure valves. The informal agendas for these sessions were flexible, with a focus on honoring the needs of the teacher-participants.

Artifact Collecting

One final means of gathering data was in artifact collecting. Pelto (1970) noted the value of unobtrusive measures to support findings. "Examining cultural behavior with a variety of different approaches greatly enhances the credibility of the research result" (Pelto, 1970, p. 145). Evidence of instructional skills and strategies in the forms of teacher-produced or student-produced materials were obtained for analysis and verification. These "artifacts" served as catalysts to teacher descriptions of lessons and the ensuing student responses. This type of permanent record, graphically depicted the teaching experience and added another dimension to the teacher's recollections.

Additional artifacts were monthly minutes from the Instructional Advisory Committee (IAC) which provided information on department goals and expectations resulting from the training. In addition, individual teacher application lessons, sometimes outlined in these documents, provided further verification of the applications observed in the classroom.

Figure 3. Flow Chart: Nomination of Subjects and Data Collection



Thus, a number of both primary and secondary sources: participant observation, note-taking and coding of reflective logging, interviewing and artifact collecting were utilized to gather data. In addition, a modest attempt at observer triangulation and methodological triangulation was employed to provide sufficient and reliable information from which this research could develop verifiable case study profiles.

Data Analysis and Verification: Constant Comparative Methodology

To analyze and verify the data, the overriding methodology of the constant comparative method as described by Glaser (1965) seemed most appropriate and feasible to this study. Glaser (1965) stated that the application of the constant comparative method was appropriate for any kind of qualitative information.

The specific stages in the constant comparative method were described to clarify how the actual data was analyzed. Glaser's (1965) model had four stages that represented a progressive process with each stage propelling the process to the next stage. Glaser (1965) described these stages as:

(1) comparing incidents

(2) integrating catagories and their properties

(3) delimiting the theory and

(4) writing the theory.

Coding and Comparing

In the initial stage of comparing incidents, the researcher coded in as many catagories as possible. In addition, Glaser (1965) elabor-

ated on a strategy he referred to as memoing in which the researcher reflected on the coded material and recorded or made a memo of the thoughts or connections that occurred as the notes were read and/or analyzed.

Miles and Huberman (1984) quote Glaser (1978):

> [A memo is] the theorizing write-up of ideas about codes and their relationships as they strike the analyst while coding. ...it can be a sentence, a paragraph or a few pages ...it exhausts the analysts momentary ideation based on data with perhaps a little conceptual elaboration (Miles & Huberman, 1984, p. 69).

Integrating Codes

The coding and memoing processes led to the subsequent stage of integrating categories in which the researcher compared incident to incident with properties of categories, looking for the critical attribute(s) or important characteristic(s). If the coded incident lacked the similar property, a new category was coded.

Delimiting The Theory

Again, the stage led to the next which Glaser (1965) called the delimiting theory phase. Now, the researcher began to reduce the original list of categories into a smaller number by synthesizing these new catagories at a higher level. In this stage, the researcher was concerned with the properties of the category more than the specific incident(s).

Writing The Theory

Finally, the coding, memoing, comparing and synthesizing lead to major themes which in turn led to the theory or theories. By collating

the memos on each category, one was able to begin writing the theory. Glaser noted that "keeping track of one's ideas, as required by the constant comparative methods, raises the probability that the theory will be well integrated and clear, since the analyst is forced to make theoretical sense of each comparison" (Glaser, 1965, p. 444).

In this study, five separate participant notebooks were kept and coded. However, in order to compare and search for evolving patterns, the coding was standardized for all five cases whenever possible in order to facilitate integration and synthesis of pattern-finding.

Also, the log yielded "soft data," a sense, an essence of what seemed to be evolving in each case study. The coding technique was integrated with the use of the log to again aid in management and analysis of the data. In this way, the coding facilitated finding emerging patterns or themes in the reflective notes as well as in the observed data.

Summary

To summarize the data analysis and verification methodologies, the constant comparative technique advocated by Glaser (1965) was the overriding technique used by this investigator to scrutinize data for verification. Through this highly structured analysis tool that required constant comparing and integrating of codes and the delimiting and writing of theory, analytic verification was attempted.

In addition, verification of findings was further attempted through triangulation methodologies. Both observer triangulation and methodological triangulation processes were employed in the study.

Reporting the Findings

The findings of the study take the form of "thick description" (Geertz, 1973) in the narrative form. Wolcott (1975) suggested that the proper ratio between description and commentary is a perennial issue. He goes on to say that a high ratio of information to explanation is probably better.

Yet, the qualitative information must be reported in the language of the arts, according to Eisner, for the language of reporting is critical. (Eisner, 1979) Eisner states that:

> What is ironic is that in the professional socialization of educational researchers, the use of metaphor is regarded as a sign of imprecision, yet, for making public the ineffable, nothing is more precise than the artistic use of language. Metaphoric precision is the central vehicle for revealing the qualitative aspects of life (Eisner, 1979, p. 200).

Using Eisner's perspectives, the reporting attempts to "present rather than to represent." (Eisner, 1979, p. 201) As he explains further, to present is poetic, while to represent is merely "conventional utterance" (Eisner, 1979, p. 201).

In addition, the narrative report of the findings was laced with documented vignettes to illustrate various points. Miller and Evko (1985, p. 694) reference Lofland's technique of representative excerpts "as a sound reporting strategy in ethnographic narrative."

The narrative was also supplemented by graphic displays of the data as advocated by Miles and Huberman (1984). The two authors elaborate various display formats and argue that "you know what you display" (Miles & Huberman, 1984, p. 79). Their support for graphic displays rested on the notion that the narrative text alone was dispersed

and sequential, rather than simultaneous. A graphic display could bring immediate focus through systematic arrangement of data.

Although it was the hypothesis of the researcher that patterns connecting creativity and transfer would emerge, the overriding goal of the study was to provide a "thick description" of the phenomena. Generalizability was not a major focus, but more relevant to this study was an understanding of why some people seemed to be able to behave more creatively in transferring new learning.

Yet, in Wolcott's (1975) discussion of judging descriptive accuracy, he cites Fake's commentary: "To describe a culture, then, is not to recount the events of a society but to specify what one must know to make those events maximally probable" (Wolcott, 1975, p. 121). The reporting of this study attempted to describe the creative transfer of five teachers in a way that suggested appropriate anticipation in similar cases.

In conclusion, the findings were reported in narrative form, using both representative excerpts, metaphoric language and graphic displays as elaborative and clarifying techniques.

CHAPTER IV

ANALYSIS AND VERIFICATION OF DATA

> What lies behind us and what lies before us are tiny matters compared to what lies within us (Ralph Waldo Emerson).

The primary tool for data analysis in this study was embedded in the methodology of Glaser's (1965) constant comparative method. Adhering to this model, there were four distinct stages used in the analysis process: 1) coding and comparing incidents, 2) integrating categories, 3) delimiting the theory by reducing the number of categories through synthesis into more encompassing theoretical units and finally, 4) writing the theory. Although the stages progressed somewhat sequentially as one phase propelled the researcher to the next phase, there was also continual need to go back and forth between the stages as the theory emerged.

The constant comparative methodology outlined in this chapter was applied to this specific study. To provide the contextual framework for the analysis, this chapter began with five brief scenarios representing the five cases studied and the initial coding process.

Following the descriptive case scenario-coding, the analysis of the data continued with an explanation of subsequent coding processes. Illustrations specific to the study accompanied the delineation of

Glaser's model (1965) of comparing and integrating codes to elaborate on the emergent theories extracted from the study.

Finally, an analysis of data was synthesized as the theory was delimited and in the theory writing phase as disparate pieces of the puzzle were pulled together. Figures 4 - 7 graphically depict the constant comparative phases as utilized in this study.

Analysis and Verification of Data

Phases of Constant Comparative Methodology (Glaser, 1965)

Figure 4.
Phase I: Coding and Comparing

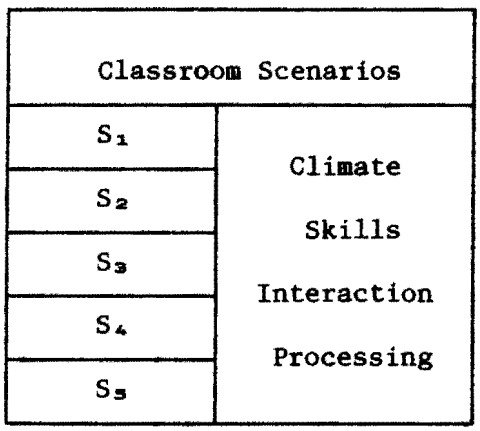


Figure 5. Phase II: Integrating Categories and Their Properties

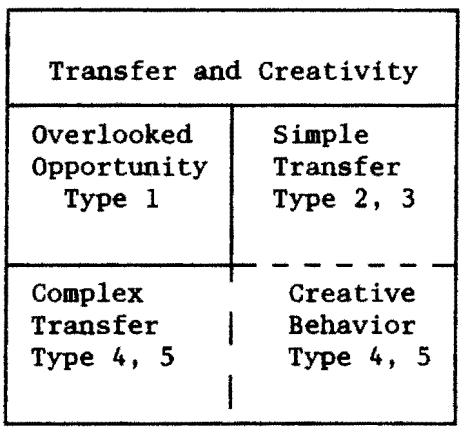


Figure 6. Phase III: Delimiting The Theory

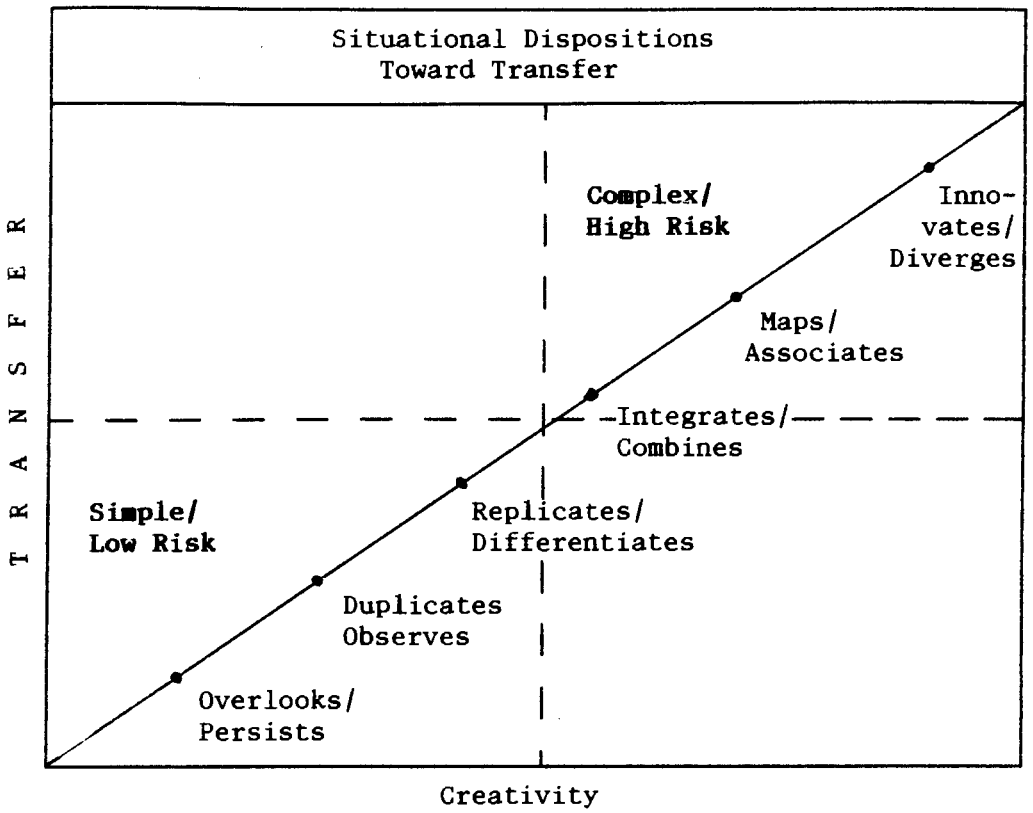


Figure 7. Phase IV: Writing The Theory

Transfer / Learner / Creativity		
Theories of Behavior	Learner Behavior	Theories of Behavior
Invents	Innovates	Diverges
Bridges	Maps	Associates
Abstracts	Integrates	Combines
Hugs	Replicates	Differentiates
Practices	Duplicates	Observes
Misses	Overlooks	Persists

Phase I: Coding and Comparing

Glaser (1965) suggested in the initial coding process that any concept or idea expressed in the notetaking phase was a potential category. Once the categories were established, each coded incident was compared with previous incidents bearing the same code. Focusing on the instructional skills and strategies presented during the three days of training input, the initial coding encompassed the concepts of climate, skills, interaction and processing. These primary coding categories were assigned to the observation notes for each of the five subjects. The accompanying figure showed a graphic display of this initial process as it was applied to the five subjects: S_1, S_2, S_3, S_4, S_5. These cases were then represented in five separate scenarios.

Figure 8. Phase I: Coding and Comparing Classroom Scenarios

S_1 "The Guide"	Setting Climate
S_2 "The Wizard"	Teaching Skills
S_3 "The Coach"	Structuring Interaction
S_4 "The Weaver"	Processing Metacognitively
S_5 "The Counselor"	

Each case was depicted from a holistic perspective to give the reader an impression of the five teachers. To help the reader glimpse

a slice of classroom life in each case as the comparing and coding was done, and to provide further contextual clues, the scenarios focused on four areas of the instructional process that included teaching for, of, with, and about thinking. To elaborate briefly: 1) Setting the climate for thinking encompassed physical room arrangement, teacher mobility, question and response strategies and teacher expectations. 2) Teaching the skills of thinking involved explicit instruction in both critical and creative mental processes such as prioritizing, predicting, inferring and generalizing. 3) Structuring the interaction with thinking focused on student to student interactions as well as students interacting with the materials and information with advanced organizers. 4) Metacognitive processing about thinking stressed processing that required student awareness and control over their own thinking and learning. These four areas corresponded with the four elements of classroom instruction highlighted during the staff development inservices that served as the catalysts to the ensuing study of teacher transfer.

The scenarios were documented with representative illustrations taken directly from the observation notes and the initial coding process. The illustrations served to support the incidents described, as suggested by Lofland in Miller (1985).

Scenario 1: The Guide (S_1)

Setting the Climate For Thinking

As one enters through the doors of the French class, it's as if one just stepped onto a touring bus along the streets of gay "Paree!" The excitement of the adventure that's about to begin is signaled in the animated voice of the petite, energetic tour guide.

Vacillating, staccato style, between French and English, she greets the various student passengers with personal remarks and grand, sweeping motions to accompany her facial expressions and excited tone of voice.

"Bonjour"

"Yea! Yea!"

"Merci"

"Mon amie"

"Oui"

"N'est ce pas?"

"Parlez-vous, Francais?"

Amidst this settling-in process, fellow passengers cluster together and exchange greetings and remarks. Gingerly, yet briskly, la guide d'tour, makes her way about the "bus." Varied points of interest are previewed for the group; some are traditional, historical or relevant "musts," while others are deliciously cultural and festive in nature.

"Today, we must review the book for the test on verbs and verb tenses."

"Did you see the piece on Jean Paul Satre?"

"We'll be ordering "croissants;" chocolate or plain; one each; Mmmm."

"Notice the photo of the Mardi Gras."

As the formal "tour" begins, the vibrant narration of the guide seems to gain both in volume and momentum in expectancy of what's ahead. Yet as the bus proceeds and makes its first stop, her voice seems to settle into a more rehearsed, more reserved style, with occasional bursts of enthusiasm as an idea strikes her.

"N'est ce pas? Isn't that so? Isn't that right? Doesn't she? Isn't it?"

"Mon - masculine!"

"Let's zip through endings."

Some points on the tour seem only to be endured for their traditional value. The genuine excitement is missing from this formerly lively voice as she quiets down and instructs the passengers to read in the guidebook.

"Review separately; by yourself; independently."

After some time has elapsed, she looks up from her official seat.

"Fini?" and proceeds to review the book answers with the whole group.

This guidebook capsulizes the basic information that the passengers need. She knows this, and thus, uses the book to cover the basics. But to sense the real France, for that to come alive for her passengers, she transmits the "essence" of it through the cultural, festive elements so familiar to her from her extensive experiences in France, itself.

Pantomime and acting come naturally to this guide, as she tries to communicate this essence to these inexperienced visitors to France.

"Lunettes, glasses; little moon, (as she encircles her eyes with her fingers in exaggerated gestures) and makes an aside, "lunatic; looks at the moon."

"la neige", (drawing a snowman on the board and pretending to shiver uncontrollably).

"fait du vent", (and whistles like the wind).

Skills of thinking are interjected to help get a grasp on the numerous things that the passengers glimpse through the window as the bus streaks by.

"Encore. Visualize. Close your eyes. See it. Type it in."

"Look for terms and relationships."

"Je n'est ce pas?" You don't know. Try to describe.

The guide's immersion in France, and love for the real France and the memories she holds, surface throughout her talk. Yet, the flow is abbreviated; stopped; over and over again, much like the intermittent motion of the starts and stops of the tour bus itself. The undercurrent of excitement, evident in the voice is the one continuous thread tying together the journey.

Structuring the Interaction With Thinking

As the bus begins its last leg, she keeps the audience tuned in through a variety of games and activities that vary the pace and tempo of the ride.

"Bingo - Team, Team 2; call out number; go for square; can coach each other."

"Memory Game; must act out all previous words and add your word to the progressive memory game." (words: angry, search, shrug ...)

"Now, chant these four times: e, es, e; Encore: visualize; see it; type it in your brain:

- e - es - e -ous - ez - ent

"Find your partner. Do Ex. 1 and 2. En Francais. Ensemble. Review; finish book for test."

"Review for culture test. Team 1, Team 2. Get close together."

"Interview your partner in French. Ask three questions. Rest will guess who you interviewed. En Francais!"

Metacognitive Processing About Thinking

Hoping to get them to internalize, to question, to become involved in a personal way, she leads them into some reflective processing.

"Does everyone have this? Don't be shy. Scream! Yell!"

"There'll be lots of details on the test tomorrow. Go slowly."

"Look at the list. Choose carefully."

"We need your brain power"

"Reflect on the questions. Write a few words."

Winding down and nearing the end of this brief tour, the students begin to shuffle their belongings and prepare for the exodus off the bus. France, in a flash, then onto the next tour.

Scenario #2: The Wizard (S_2)

Setting the Climate For Thinking

Bounding about the room as if he had springs in his shoes, the wizard teases his student audience/participants with puzzles, riddles and reasoning.

"Chris, give it a shot. He chooses Door #4. Now, tell us the answer you've selected and why."

"Process of elimination? Good technique. Fantastic! Why?"

"Another one. He chooses Door #3. Ratio. Why?"

"Great. We did just finish talking about (ratio) the day before. Talking about what we did the day before helps us get to today."

"Hangman. Solve puzzle.

C O M P L E M E N T A R Y

He lets them know that they are part of the show. He tells them that, he teaches, they teach others and they teach themselves. But, h also provides a constant patter of feedback and reinforcement that, even though given in a playful manner seems to honor and dignify every answer.

"This group is hot."

"Hear some good talking, here."

"Holy Smokes! You got this! How?"

"No idea? Remember you can go to other groups."

"Is this all? Check with others. Talk to teammates."

"I'll tell you. That's the right one. Now, you tell me why."

"Bingo, Linda's ready."

The audience knows that the wizard is the "wise one;" yet his uses of "magic" as he searches among them for evidence of thinking intrigues them. He challenges them in such an entertaining manner that they are almost tricked into postures of wonderment as he captures their interest and catches them thinking.

"What is the geometric mean?"

"Oh, listen I feel a theorem coming on." (As a student carefully states her idea.)

"Ever play the Pyramid game? What do these have in common? Say one word: sewer pipe, mountain, ski hill."

"Slope! Silly. You've already figured out that this is leading to something."

The wizard knows his students well and he uses a clever humor throughout his class that signals he is right on target with what's going on.

"He has it in his head. That's why he's not writing it down."

"I thought I had to dust the cobwebs - but I need a snowshovel."

"David, this is the easiest one (question) in America."

"He doesn't believe it. Convince him."

"I can help you with it, but I can't reteach whole course."

"I thought about inventing graph paper Kleenex. Why is that a good idea?"

He signals expectations that will transfer the learnings beyond the classroom and into future academic or life situations.

"If you're going to be successful quizzer - when you hit the door - you must 'Learn it for life, not just for the test'."

This wizardry continues throughout the session as he entices students into entertainingly complex problem-solving situations. His pacing is fast as he poses question upon question. Expectations are there for students to respond and justify.

"Door #4 Linear Equation? Want to change your idea?"

"What do you think?"

"Why only consider positive values?"

"Have you seen this one before? Yep, it was on the test. How many wrote 4, not -4?"

The wizard relishes in his games and exhibits a contagious energy and enthusiasm for his art. He believes that kids are used to being entertained and uses that knowledge to work for him in the classroom.

"Now you might like this one."

"Why is Jeopardy the best game show? Yes - they give the answer. You ask the question."

"In the relay race, there will be five rounds. And remember goose egg gets double points. That - keeps us all in the race."

His energetic quizzing forces students to hypothesize, analyze, verify and evaluate:

Forced Hypothesis Question: "What was name of the last chapter? How does it connect?"

Forced Analysis Question: "What makes #4 different?"

Forced Verification Question: "Algebra I: Algebra II: Trig. Right, Jeff. Why is trig like geometry? How did you get it?"

Forced Evaluation Question: "Did we accomplish it?"

Structuring the Interaction With Thinking

His lightning speed and unpredictable targeting keep students alert and involved. Yet support is always evident and feedback is specific and pointed.

"Anyone need help?"

"Tests - very fine. 23/30 average."

He varies the interactions depending on the purpose.

"We'll need partners for this one."

"Girls take odd rows. Boys take even."

"Teams by rows."

Metacognitive Processing About Thinking

Above all, as the wizard works his spell on the captive audience, he spins a constant tale of why they are doing what they are doing. His modeling of explanations and reasons overrides every aspect of the interaction. The students leave with an understanding of not only what and how, but also a sense of why.

"Why do I make you memorize theorems and definitions? Because in mathematics, the system is built from scratch. If pieces are missing, the pyramid tumbles. You must memorize certain things."

"Don't let your algebra get in the way of trig."

"What are some memory tricks. Learn part now; before school ends learn another section; before tomorrow, learn rest; or tape record and play in your sleep."

"Bring calculator. I will make sure you know how to use it."

The wizard sums up his feelings when he says, "I don't come to work. I come to school. I have fun, too."

Scenario #3: The Coach (S_3)

Setting the Climate For Thinking

The climate is informal, with student performers funneling into the tiered choral room. Activity swirls around the grand piano placed strategically in the center of the semi-circular tiers.

Students handle the management of materials and equipment with efficient procedures, routinized at some time earlier in the year. Attendance, announcements, money collections for the full agenda of extracurricular events, as well as books and sheet music are all systematically managed by various students. They appear responsibly in-charge and seem to tend to the tasks with pride and care.

"Management."

"Fruit?" (student handles)

"Symphony tickets, up front." (Another student collects money.)

"Bus, after 1:00 P.M."

Student: "I have an announcement."

A steady stream of students stop by the piano area, making requests, excuses or just to remark in passing as they make their way to designated spots on the rows of tiered risers. The teacher reacts personally to each, fielding the multitude of decisions in a friendly, (sometimes even non-verbal) expedient manner.

The warmest of smiles lights her face, just as her total demeanor suggests enthusiasm for this role that requires much of her time and energy, both in and out of the school setting.

All this commotion is abruptly halted as her coaching posture is

assumed and a chord is sounded on the piano to signal attention and readiness for the work at hand.

"Warm-ups, first."

"Jeff, turn around."

"Care!"

"Sit tall".

"Quiet."

"Breathe."

"Jeffrey?"

(Modeling, smiling as she waits expectantly for their full focus.)

The energy level is incredible. Pacing is brisk, the content heavy. A sense of purpose pervades the atmosphere for live performance dates are many. Just as in any performing art, the "show" is the goal. Preparations for upcoming events keep interest piqued and the pressure on.

"Madrigals. Methodist Church." (An aside to the unknowing visitor ... "We've been selected as one of six groups to go to Allerton in March."

"Sunrise service."

"Madrigals - Concert in hall before Band and Orchestra."

Throughout the rehearsals, this music coach takes the lead in accompanying each piece both vocally and technically. With fingers flying across the keys, she grandly mouths the lyrics, sets the tempo, plays the melody and interjects cues to signal direction, style and intent of the music.

"Let's run this section."

"Stay with me."

"Watch the pitch."

"Yes. Better!"

"Do we look motivated?"

All in the room are immersed in this world of music and performing. Yet, time is alloted for special interests of students, aside from the traditional high school repertoire, as individual interests and talents are showcased.

"Extra credit performances. Who's first?"

"West Side Story"

"Next? Beth."

"Friends, by M. W. Smith."

Yet, as these young people perform, they instinctively rely on the inherent talents of the coach. Their appreciation (and awe) of her talents is seen in the requests for accompaniment. Regardless of the selection, they expect her to know it ... and she rarely disappoints them in their expectations of the expert.

"Westside Story. Will you play for me?"

"Play with me? I'm having trouble with the rhythm."

"One voice lesson. Will you run through with me?"

Expectations are high. The school has a reputation to uphold and the students are aware of this. They are motivated to excel.

"Sectionals. Last chance to fix-up. One week from Thursday."

"You have one minute to review text. Then, we'll do from memory."

"OK, you know what you have to do."

Teaching the Skills of Thinking

This experienced coach models the behaviors of direct instruction of a skill. Directions are clear, concise and crisp. Monitoring is on-going as she laces the practice with pointed feedback that is both positive and critical, as they strive for perfection in their performance.

"Class. We'll take the alto section."

"Sopranos, do you see where you are?"

"Good. Chopped."

"I need a tenor."

"We're starting."

"Bravo."

"Tenors. Sing with them. Then cut out and let them do refrain."

"Phrase ending. Not too fast."

To clarify her directions, this coach relies on vivid analogies to make her instructions concrete and explicit. These mental pictures are often accompanied with the gestures and pantomime noted earlier.

"Swell, like an organ opening the pedal."

"Tune it, ... hold on ... like an oxygen tank on your back."

"Shh - spit it out like pulling taffy. Look!" (as she demonstrates).

"... swimming a little bit in that section."

"... like an orange peel inside out in back of your throat."

Structuring the Interaction With Thinking

Throughout the intense, fast-paced classes, the coach is interacting intensely with the whole group, while intervening with specific cues and feedback for the different sections and for individual performers.

"Listen! Listen! Balance the chord; space back here, in tune."

"Shape it, Carol!"

"Altos! Flat!"

"Space it back. Drop out altos."

Modeling images through pantomime, stressing posture, facial expression, tongue position, the set of the jaw, the skillful performance of the experienced coach is mirrored by the students. Reflective imaging in this vocal music class epitomizes the same metaphorical mirroring behavior used in the coaching of athletic champions.

"Sit tall." (She models).

"Shape your mouth. Pucker! Pucker!" (She exaggerates a pucker and deadpans, as students dissolve in laughter).

"Lips barely touching ..." (showing them).

"Sit tall. Breathe!" (as she demonstrates the breathing).

Aware of the need to move and restructure to keep the intensity and focus, the class is often arranged accordingly or instructions are given to change stance at their places.

"Quickly. Form a big circle."

"Five around the piano."

"Stand in a circle. Mix up."

"All cluster around piano for this part."

"Stand in formation."

Metacognitive Processing About Thinking

Metacognition, how to sing it, why ... is built into this instructor's repertoire. Instinctively understanding the value for monitoring and evaluating one's own behavior, this coach models an ongoing talk-aloud strategy that students tend to internalize over time. Her ear for mistakes is uncanny as she targets problem spots in the group, adjusts immediately and carries the group through the piece.

"What's happening to pitch?"

"Last two measures. Right. See the connection."

"Whatever happens, stay with me."

"That's better, sopranos; better vowel on a."

"... takes too much concentration. Sections are mixed up."

"Keep tapping quarter notes."

Evaluation is requested as well as given, as this coach guides her players toward improvement, synchronization and pride in doing their best.

"What will make this phrase better?"

"What about vowels?"

"Altos. What are you doing? Look at the notes."

"Compare this to the performance last night." (Student answer: "More balanced" - with his explanation of what he meant.)

Scenario #4: The Weaver (S_4)

Setting the Climate For Thinking

With patience and precision, this master weaves the threads of his discipline into an intricate pattern of exquisite design as he instructs his student apprentices. The pattern begins with a skillful approach to questioning students as he asks and probes and extends:

"Why?"

"Explain?"

"Then? ... Then? ... Then? ..."

"What else?"

"Who agrees? Disagrees? Why?"

The artistry of the questioning pattern is elaborated as he intentionally introduces each point by weaving the name of the student and the student's response into a spiraling question and response design.

"Dave says ..."

"Katie might be on to something ..."

"Ken shakes his head ..."

"Tatiana thinks ..."

"Let's build on Scott's comment ..."

"Victor, right on the money ..."

His enthusiasm for his craft is shared with students as he delights in the wonders of science.

"Isn't it amazing that every single inherited characteristic is determined by five elements?"

"Imagine, red hair, blue eyes, each dictated into every single cell."

"We're talking plants, right? So how does the water get all the way to the top of a redwood tree?"

"Let's solve the mystery. Why are some groups seeing change in the water color and others are not?"

And his expectations for student thinking and for cooperative interactions are signaled both verbally and non-verbally with humor and warmth as he weaves his way throughout the openings in the rows of desks.

"Scott, draw some parameters on this."

"Victor, what about ..."

"Steve needs help. Who's gonna bail him out?"

"Tim, are you catching some dreams?"

Teaching the Skills Of Thinking

The complexity of his weaving technique is further illustrated as he masterfully integrates lecture information and textbook references into this already complex verbal interchange. He gingerly laces the lecture with questions that lead students to hypothesize, predict, evaluate, compare and conclude.

"Replication, rather than duplication - half new molecules, half old. Do you buy that?"

"Isotope, another form of an element."

"Notice the question in Watson and ... (text)?"

"There are a lot of appendices. Turn to the back of your book ..."

But the design of the weave begins to reveal several more layers of intricate, deliberate patterns. The master weaver delicately manipulates the cloth of this classroom as he introduces the threads of higher level thinking.

"Looking at the data, what conclusions can you draw?"

"What evidence supports your statement?"

"I suggest you compare RNA and DNA."

"Let's hypothesize ... one more possible theory ..."

"Predict what you think will happen."

"Can we capture key concept? Generalize what we've said?"

As the students are drawn into this beautifully designed web of intrigue, he illustrates the conceptual information with colorful and relevant analogies. By describing these concrete examples that are familiar to students, he anchors the new learning throughout the patterned interaction with these carefully selected mental images.

"... pairing replication, like a zipper with teeth on one side."

"How many have worked a jigsaw? Anyone else start on the outside, the boundary? Why?"

"Just like Indianapolis. They don't just turn a key. A guy stands behind the car and ignites the turbo charger."

"It's similar to a squeeze coin purse ..."

"You've seen the paratroopers come out the door like a chain reaction ..."

"... like a slinky, stretched out."

Structuring the Interaction With Thinking

Using his skill as the master weaver, the patterns of interpersonal interaction are integrated into the encompassing design. Taking advantage of the lab in the back half of the room, he frequently organizes small groups of students around the lab tables that have been carefully equipped and set up with the necessary materials.

"Use the dice rolls to determine the number ..."

"Illustrate the final creature you've created showing all the critical attributes."

"With your lab partners, make a classification key for another group's creature."

"Determine in your groups the roles for each member."

"Kids who finish first, act as consultants to other groups."

Paralleling the interpersonal interactions of cooperative groups, the weaver also incorporates interactions with the concepts and materials. Both pencil/paper advance organizers and hands-on laboratory experiments are interspersed into the instructional strategies.

"Using the morphological grid, or matrix, ..."

"Before the session begins, mingle (using the question sheet) and see how many can answer any of these questions." (eg. Find someone who can compare a plant cell to a jail cell.)

Metacognitive Processing About Thinking

Adding the final touches to his intricate pattern of classroom interactions, the weaver knits the metacognitive element into the finished fabrics of his teaching. His structured processing and discussions help students stand back from the lesson at hand, and look at

it as a strategy or skill for further use. This is the thread he uses to tie the learnings together. Through this metacognitive element he helps students extrapolate the essence of an idea and apply the concepts across curricular disciplines and into life situations.

"Did anyone find out from the math teacher about the double helix we were talking about in here (science)?"

"You should be writing notes in your thinking log throughout - about the theory of evolution."

"A practical application; the pipes in your home all have calcium deposits ... more pressure ... dribble ..."

This weaver further illustrates his mastery and understanding of the learning process with a subtle, but powerful metacognitive strategy at the end of the period.

"Take the last five minutes to get organized for your next class."

Not surprisingly, he continues to weave the threads of his own learning into various applications in his life outside the biology lab.

"I'm going to use the web strategy with my real estate class tomorrow night."

"I can't wait to teach the gifted summer school (3rd graders) so I can try these ideas out there."

"I presented at the Illinois Science Teachers Association and I used the create-a-creature classification lesson."

"I'll be presenting again in Chicago in November. I'm gonna use the people search, again."

Scenario #5: The Counselor (S_5)

Setting the Climate For Thinking

The focus is on fashion, food, and family as students in the Home Economics sections learn to "Celebrate Life." The settings vary with activities planned for typical classrooms, the day care center, kitchen units, sewing rooms and even, video-recording studios. The diversity of programs depicts the diversity of life itself, as this caring teacher assumes the role of counselor and sets the climate for learning.

"Let's get around together in a circle."

"We've changed the desks from rows to a circle so we can see and hear each other."

"Let's go around the circle."

As she quietly monitors the discussion, she questions from a counseling or psychological perspective, dignifying every answer and placing a focus on individual worth.

"So you're saying ... (paraphrasing)"

"I've gotten a new insight." (honoring)

"What would a compromise approach be?"

"Yes. That seems basic to good mental health, doesn't it?

"What did you discover?"

"What else?"

"Dave, how do you feel?"

Teaching the Skills Of Thinking

Always in a warm, yet dignified manner, she smiles and reflects on the student response, then pushes the class toward analysis, synthesis, and evaluation.

"What are you hearing? Can you summarize?"

"As you review, find the questions you think you know the answers to. Then ask those questions of others to verify."

"Prepare selected readings. Be ready to compare."

"Watch a friend's presentation (of a children's book) and give feedback for improvement."

The diversity of skills necessary for the many areas of learning is evidenced in the topics listed on the Spring program: "Celebrate Life."

"Nutritional Notes" (Analyzing the elements of healthy and nutritious meals.)

"Color Highlights" (Comparing and contrasting color tones for cosmetics and fashion.)

"Childlife and Literature" (Dramatizing the essence of the storyline and analyzing the lessons in the story.)

"Child Development Studies" (Analyzing the developmental stages and inferring the implications for parents and teachers).

"Stress" (Evaluating and Problem-Solving).

"We Manage" (Sequencing, prioritizing, organizing, researching).

"Fashion Display" (Designing, critiquing).

"Commercial Foods" (Decision-Making).

Projects, with concrete products provide the perfect setting for the integrated series of skills involved in the creative process. Students generate ideas, put their ideas together in a novel way, attend to details by analyzing problem areas, revise, enhance, critique and finally, celebrate a job well done through various productions targeted to selective audiences.

"Prepare a piece of children's literature. Use puppets, costumes, scenery, props, voice changes ... whatever you think."

"We'll videotape each presentation so you can see yourself."

"The spring program "Celebrate Life" was a huge success. We have to move to a larger hall."

"The spring program may be the only opportunity some of these kids have to be on stage ... and they are great. They do a beautiful job."

Structuring the Interaction With Thinking

Taking full advantage of the practical arts format which provides the ideal setting for structuring informal small groups, face to face interactions, this teacher is particularly sensitive to the benefits of such structures.

Tailoring each interaction for optimal emotional support, she prepares carefully for the lesson. Sometimes large circles are deemed best for personal sharings.

"Let's use the large circle so we can hear each other."

"The role-playing characters should sit in the center of the semi-circle so we can view your faces as you talk."

Other times, the interaction pattern preferred is small teams.

"For the parent rights scenarios, find two other 'law partners' and form a law firm."

"Build cases for the parents with the law in mind. Each partner in your firm should help support your stand."

"For the dress rehearsals, find a partner who will watch and tell you what it looks like."

"Work in teams for the show. Prepare together."

"I'll meet the teams in the video room."

The counseling perspective seems at the root of every interchange as she perceives the underlying problems or circumstances surrounding the student and opts for the solution or action that dignifies and develops the person. The flexibility is noted over and over.

"One girl had been very mouthy yesterday, and the kids sensed it and handled it."

"We'll finish the video that _____ brought to share.

"I planned for the parent's right law teams, but we can start those tomorrow."

"I noticed you were really touched by the film. I almost cried, too."

"I had planned a different lesson, but the slide production "Shades" deals with peer pressure and seems so pertinent. We'll catch up this week."

Metacognitive Processing About Thinking

Although, at times, the kids think they've manuevered her, this teacher is fully aware of what's going on. Her authorship of several texts in the field, "Relationships: A Study In Human Behavior" and

"Children: A Study In Individual Behavior", provides evidence that she is acutely tuned in to student behavior. In turn, she leads them toward self-awareness or she provides opportunities for self-processing.

"Can we make this work?"

"I think it's important to watch your own videotape so you can see yourself and think about things before you present to the kids."

"Ask yourself if you know it? Then ask yourself if you know it well enough to write about it."

"Isn't it interesting how the weather affects a group?"

"Why do you think we all like the weekends so much?"

"Do an attitude analysis. See how you feel?"

When conflicts arise between cognitive instruction and human needs, this counselor understands that the affective domain rules the cognitive. She opens herself up to peer criticism, perhaps, but one senses a sureness within her that she lives the values she believes as she provides a richness of opportunities for her students.

"A teacher asked me how I could let those kids perform on stage when they were such amateurs. But I believe they need that experience."

Conclusion

To summarize the initial phase of the comparing and coding process in Glaser's constant comparative methodology (1965), five classroom scenarios were presented. The initial coding for instructional incidents of setting climate, teaching skills, structuring interaction and processing metacognitively, were depicted in the scenario formatting. This initial coding process was used primarily to give a structure and order to the multitudinous notes taken during observations.

The initial scenarios also provided concise synopses of the observation notes to share with the subjects and school supervisory personnel. By sharing the scenarios with others who either participated directly (subjects) or indirectly (supervisors) in the observations, observer triangulation (Denzin, 1978) was achieved. Consensus on the depiction of the observations supported the researcher's notes and impressions and provided the methodology for verification and reliability factors.

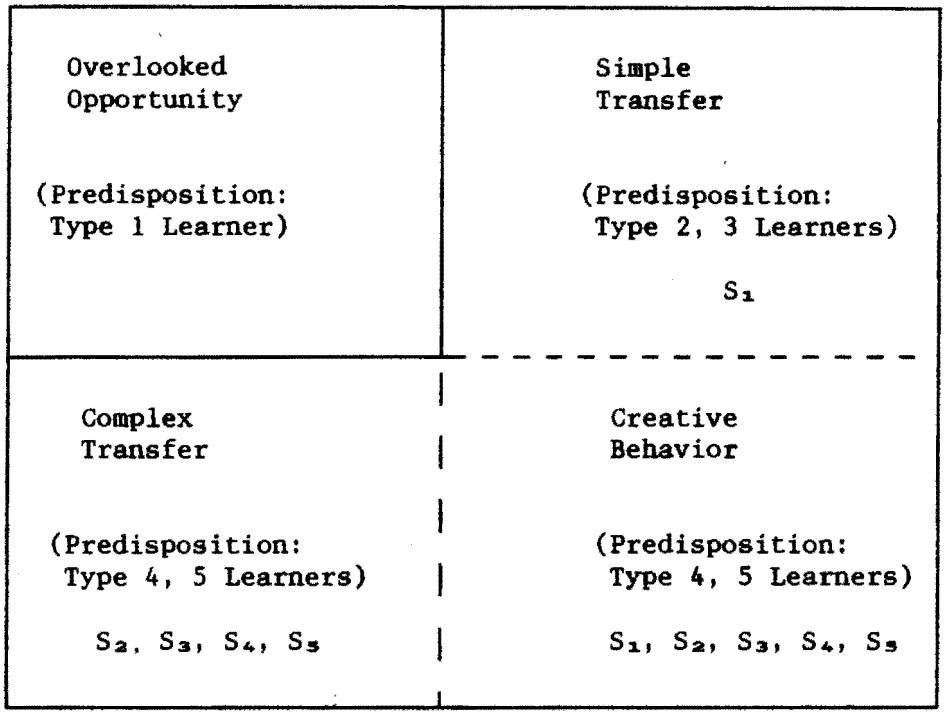
Further triangulation was achieved within this initial coding and comparing process, as well as throughout the subsequent comparing and integration of codes. Methodological triangulation was achieved in several ways since the classroom observation notes used to write the scenarios were further supplemented by interviews with the subjects and interviews with the supervisors. In addition, examination of instructional artifacts also provided support to the observation notes. Based on these additional data gathering methodologies, methodological triangulation was achieved and provided further verification and reliability to the study.

After coding and comparing the instructional incidents depicted in the scenarios, specific focus was given to coding for evidence of transfer and creativity, which propelled the coding process into the second phase of Glaser's model (1965), integrating categories and their properties.

Phase II: Integrating Codes: Transfer and Creativity

Based on the emerging data, the initial descriptive codes were constantly compared, refined and integrated into new categories that became more interpretive (Miles & Huberman, 1984) in nature. By comparing the properties of a category for evidence of teacher transfer and creativity, four new categories evolved during this integration process. The categories were coded: overlooked opportunity for transfer, simple transfer, complex transfer and creativity. The accompanying chart represents a graphic display of the process.

Figure 9. Phase II: Integrating Codes: Transfer and Creativity



The following elaborated definitions and representative illustrations clarify the integration of codes.

Overlooked Opportunity for Transfer

Definition: Overlooked opportunity for transfer was defined as an appropriate instructional instance for transfer of trained strategies by the teacher trainee which were missed.

Examples of overlooked opportunities for transfer occurred within the four areas of observed classroom instruction. The following illustrations were indicative of this coded behavior.

Climate: During the training, a climate-setting strategy of eliciting multiple answers to an open-ended question had been taught, modeled and practiced. In a particular situation, S_3 asked students to compare the previous night's performance to the day's rehearsal. Although the "multiple answers" strategy was appropriate to the open-ended statement, only one student response was elicited.

Skills: Another example of an overlooked opportunity for transfer occurred during the opening minutes of a class conducted by S_1. The skill of prediction was elaborated, demonstrated and tried by participants during the training. Suggested applications include having students predict what would happen next as part of the introductory material to a lesson. In this instance, S_1 welcomed the students entering the classroom and proceeded to delineate the day's work rather than asking students to connect their work from the day before to what the day's agenda might include.

Interaction: Yet another example of overlooked opportunity occurred. The theory involving extended use of student to student interactions was stressed during the training to provide frequent opportunities for student articulation. Strategies were then, introduced, modeled and practiced, with application examples for pre-learning, during the learning and post-learning activities. To help students review material for a test, S_1 overlooked the opportunity to use these strategies and instructed students to use the text to review by themselves.

Processing: Within the processing element of classroom instruction, the concept of awareness and control over one's own thinking was

emphasized as a major thread throughout the training. This metacognitive behavior requires students to plan, monitor and evaluate their decisions. In one classroom episode, S_1 asked students to make individual choices and overlooked the opportunity to let them justify their decisions.

Based on situations similar to the ones just described, "overlooked opportunity for transfer" became a coded category during the integration of codes. The initially described incidents were interpreted in terms of overlooked transfer and interpreted accordingly.

Simple Transfer

Simple transfer was defined by this researcher as the observed application of a skill or strategy in a classroom situation that was very similar to the training example in both content and in context. Illustrative examples in the four initially coded areas represent the integration process used to code for simple transfer.

Climate: Requiring students to listen to each others' answer and respond to each other as well as to the teacher was a strategy stressed in the training. S_2 transmitted teacher expectations for this student to student interaction by responding to an incomplete student response by suggesting that another student was responsible to pick up where the first student had stopped. This was very similar to repeated modeling of that teacher behavior that occurred during the training, therefore it was interpreted as simple transfer.

Skill: The strategy of modeling was stressed throughout the training as a key element in teaching skills explicitly to students. S_3 used this strategy while demonstrating the mouth position for a

particular sound. This concrete modeling was very similar to physical examples used during the training days.

Integration: In teaching the interaction strategy of cooperative groups, one of the required elements of the model was assigning roles to each group member. Using the training model in a very similar classroom situation, S_4 required science lab groups of four to have specific roles.

Processing: The training specified a model of making connections between prior knowledge and new learning through deliberate strategies that required student processing. S_2 used a method very similar to one that was used in the training when he asked students to recall if they had seen a similar problem before.

Complex Transfer

An observed application that is enhanced, abstracted or greatly modified from the content and/or context of the training model was coded as complex transfer. Illustrative examples of this coding have been extracted from the descriptively coded sections of climate, skill, interaction and processing.

Climate: S_2 exhibited behavior that was coded complex transfer in a particular interaction that required students to not only listen to each other and respond, but to engage in a constructive controversy. He acknowledged that the first student did not believe it and instructed another student to convince the first student. This exemplifies a complex application of the student to student response strategy since the teacher had extracted the justification element of metacognitive

processing and enhanced the simpler response pattern practiced in the training.

Skill: Explicit thinking skills were modeled in the training, stressing the need to discuss the menu of operations needed to execute the skill. S_4 exhibited complex transfer of the training model by using the concept with the compare and contrast thinking skill, which had not been specifically taught in the training. In addition to transferring to the new skill, by asking students to compare and contrast the concepts of "duplication" and "replication", he further enhanced the transfer of the trained examples by delineating the menu of operations. He instructed students to find both similarities and differences as they completed the task.

Interaction: Enhancing the cooperative learning model with a novel approach, S_5 formed groups of "law partners" to examine cases on parent rights. She further structured the goal interdependence by suggesting that they first gather their information as partners and then join with other partners to form a law firm. The law firm was then responsible to defend the case in point. This modification to the cooperative group model was coded as complex transfer since the modeled behavior was greatly enhanced by the specific teacher application.

Processing: Throughout the training, the use of a learning log was emphasized for both teachers and students. S_4 applied the concept of the log in an original way. He instructed students to keep a log throughout the semester to record their thoughts on the theory of evolution. The enhancement to the modeled log was the concept of entries made over a period of time on one concept, whereas the log

entry ideas in the training had focused on recording thoughts about one specific learning instance.

Creativity

Evidence of creativity was noted throughout the training and observation sessions. Based on lists of characteristics commonly attributed to creative individuals, specific teacher behaviors were coded and subsequently integrated through constant comparisons. Representative illustrations of each of the subjects follow.

S_4 exhibited risk-taking during a follow-up session by defending a position that was contrary to the majority of his peers. Although his colleagues were louder, more vocal and vehement about their stance, S_4 carefully articulated his opinion and gave supportive evidence. Risk-taking was a definite factor in this interaction because by taking the minority position that he did, S_4 actually implied that he had learned something new in the training, while many of his fellow teachers seemed overly sensitive about admitting that they might have learned something new. It appeared that with that admission they might not be viewed as the experts they professed to be.

Another example of creativity that surfaced repeatedly throughout the observations was the enthusiasm with which the subjects approached their teaching. In particular, S_3 signaled her passion for her work through her fast-paced, energetic sessions with students. Her involvement was intense and her enthusiasm was transmitted to the students as their behavior became synchronized with hers.

Another creative characteristic that undergirded much of the teacher behavior throughout observed instruction was the humor used by

S_2. His manner was playful and his comments were laced with wit and humor when he told one student that this was the easiest question in the universe.

S_1 also exhibited one specific creative characteristic repeatedly. She was uninhibited in her expression, often playfully miming her verbal outbursts. She told her students she was a computer and she was processing everything in binary code. Accompanying this statement, she began acting like a robotic machine.

By shunning social acceptance of her peers in terms of the appropriateness of a spring production with her students, S_3 exhibited a creative trait mentioned in the literature. Her concern for the student benefits of such a production outweighed the cynical remarks of a peer that the students were neither trained nor talented enough in dramatics to take on such a production.

Summary of Integrating Codes

By comparing similar properties of the originally coded teacher observation, integrated codes emerged that seemed to be interpretive of the teacher behavior. Specifically, teacher behavior was interpreted regarding evidences of transfer and creativity. The integrated codes of overlooked opportunity for transfer, simple transfer, complex transfer and creativity allowed ample parameters within which much of the observation data could be synthesized.

However, as the coding, comparing and integrating process continued, a further reduction and synthesis occurred as the delimiting phase of Glaser's theory was gradually approached and incorporated. This process is fully outlined in the following section.

Phase III: Delimiting The Theory: Situational Dispositions Toward Transfer

By comparing incidents bearing the interpretive codes of overlooked opportunity, simple and complex transfer and creativity, varying degrees of transfer emerged. This refined model of transfer is viewed along a continuum that ranks the transfer behavior by degrees of complexity. Within the coded category of overlooked opportunity, both intentional and unintentional omissions were noted.

Within the coded category of simple transfer, three distinct behaviors were rated: no transfer, duplicated transfer and replicated transfer.

Similarly, complex transfer was further categorized along the opposite end of the continuum. The three areas identified within the phenomenon of complex transfer were labeled integrated transfer, mapped transfer and innovated transfer.

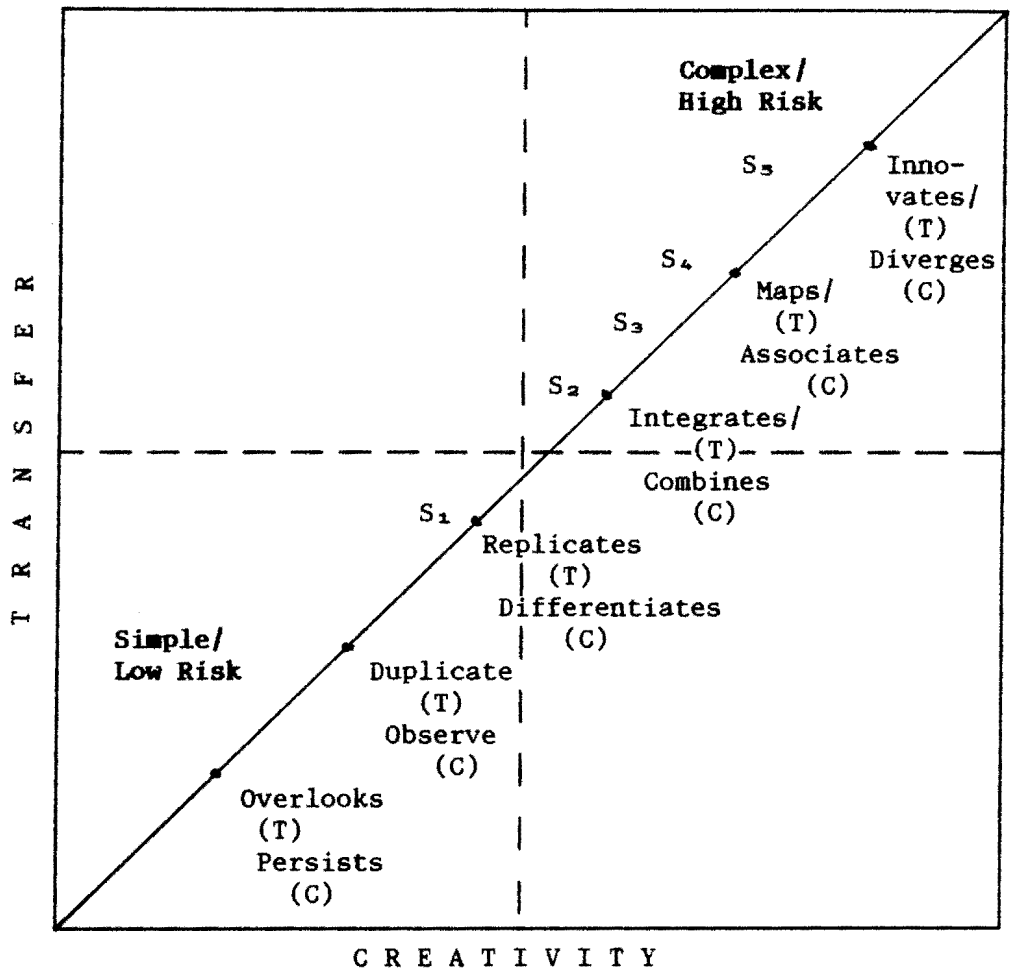
In addition, the category coded creative behavior was further analyzed according to existing theories of personality characteristics. Specific behavioral codes used to differentiate creativity were: persists, observes, differentiates, combines ideas, associates ideas and diverges with ideas.

The subsequent synthesizing of codes helped to delimit the theory of creative transfer. According to Glaser (1965), this phase of the constant comparative method leads to higher level or more sophisticated theory.

To further illuminate the process of delimiting the theory, the emergent codes are examined through specific illustrations that repre-

sent the degrees of transfer along intercepting continuums. The following diagram represents the theory suggested by the data.

Figure 10. Phase III: Delimiting The Theory: Situational Dispositions Toward Transfer



Simple Transfer

Overlooked Opportunity For Transfer

Within the broad category of simple transfer, the code, opportunity for transfer yielded two refinements. The two new categories

were coded intentionally overlooked opportunity and unintentionally overlooked opportunity. Examples of intentionally overlooked opportunities were illustrated by S_1 in two different classroom interactions.

One instance occurred as the students were instructed to review for a test. S_1 directed students to work by themselves, without cooperative support groups, because they were individually responsible for the information. S_1 had made a clear instructional decision, not to structure student groups, even though reviewing for tests had been suggested in the training as an appropriate opportunity for group work.

A second instance of intentionally overlooked opportunity for transfer in an instructional episode regarding memorization of verb endings. S_1 provided a chart of the endings and metacognitive information about how to memorize by saying, "Visualize this. Type it in your brain." In this instance, S_1 chose to tell students about the mental processes used to memorize rather than elicit the mental manuevers from them. The fact that S_1 included this sophisticated processing information suggests an understanding of the elements, and a deliberate decision to overlook the opportunity for student processing. Therefore this incident was coded intentionally overlooked opportunity.

By contrast, unintentionally overlooked opportunities were used to code incidents in which the teacher gave no evidence of awareness or understanding that a cued behavior could be transferred in the situation. For example, S_2 utilized a partner interaction strategy, but ignored the opportunity to transfer the think-aloud strategy that was modeled in the paired-partner training strategy. S_2 seemed unaware of

the instructional model and basically utilized partners in the traditional way.

A further example of unintentionally overlooked opportunity for transfer occurred as S_1 discussed an upcoming field trip. In describing the anticipated events herself, S_1 overlooked the opportunity for students to become involved by predicting what they thought would happen. Since this example had been explicitly stated in the training as an appropriate opportunity for students to practice the prediction skill, this incident was coded as unintentionally overlooked.

Duplicated Transfer

The second degree of simple transfer charted on the transfer-creativity grid was labeled duplication. Evidence of teacher transfer coded duplication indicated behavior that copied the modeled example exactly as it had been observed.

For example, a classroom energizer called the Eskimo Hurrah is modeled throughout the training as an example of positive reinforcement for students. During observations, S_1 used the modeled behavior exactly as it had been executed during the training. Since the researcher had seen instances of this strategy improvised and enhanced beyond the exact copy model, the evidenced transfer of an exact copy was coded duplication.

Another example of duplication was the use of metacognitive questioning by S_2. During the training, modeling included repeated use of two simple words during processing: how? why? S_2 duplicated this behavior by frequently probing student processing with a simple how? or why?

Replicated Transfer

To further contrast simple transfer behavior, another degree of teacher transfer was evidenced and coded as replication. Replicating transfer suggests that the originally trained skill or strategy was used as modeled, but slight adjustments were made to tailor it just a bit to the teacher's situation. The teacher differentiates what is relevant.

A clear example of replicated transfer was the People Search strategy used by S_1. Modeling her questions after the training examples, S_1 constructed a similar search but wrote it in French to fit her subject focus. S_2 also modeled replication transfer in his use of analogies. While the training modeled the analogy within the realm of thinking skills, S_2 used the analogy in his content area of math by asking students to respond in turn to the analogy: algebra I: algebra II:: geometry: trig.

Complex Transfer

Following the coding refinement process, complex transfer was further coded into the three categories of integrated transfer, mapped transfer and innovated transfer. As depicted in the chart, integrated transfer seems to be characterized by the creative behavior of combining ideas, while mapped transfer seems to be liked to the creative characteristic of associating ideas. In addition, innovative transfer appears to be connected with the creative behavior of diverging with ideas. Examples of these transfer behaviors are taken directly from the observation notes.

Integrated Transfer

Integrated transfer in which new ideas were combined with old ideas in a classroom interaction were modeled by S_4. Throughout a discussion, as S_4 alternated lecture information with student responses, he would casually ask students to draw conclusions from the discussed data. Although drawing conclusions had not been an explicitly modeled and practiced thinking skill in training, S_4 integrated the use of the skill appropriately with his lesson. He combined his usual lecture/questioning technique with the new concepts of thinking skills. A further explanation of why this was coded as integrated transfer lies in the fact that S_4 did not actually teach the skill of drawing conclusions as advocated in the training of thinking skills. Therefore, S_4 did not actually transfer the learned strategy of teaching an explicit thinking skill, but rather integrated the notion of requiring students to apply thinking skills within the content.

Still another example of integrated transfer was evidenced by S_5 in her spring production. Using the concept of a culminating production to showcase the year's work, S_5 subtly integrated a major concept of the training that focused on student responsibility and the positive effects of small group problem-solving. Although the specific cooperative grouping model was not used in a explicit transfer mode, S_5 did integrate components of the training into the project-focused activity. Behaviors coded as integrated transfer were further defined by this lack of explicit transfer. Integrated transfer applies the learned skills and strategies subtly by combining new ways with old ways. Integrated transfer occurs through an apparent raised-consciousness

about training, rather than through visibly modeled strategies learned during the training. Teacher comments that signaled integrated transfer behavior alluded to the idea that she/he had not actually done a strategy from the training, but continued with their former strategies but an acute awareness of the training concepts guided the instructional incident somewhat differently than he/she had formerly done.

Mapped Transfer

Whereas, integrated transfer was evidenced as subtle, yet complex transfer through raised-consciousness, mapped transfer was highly deliberate and visible. Mapped transfer was, however, considered highly complex because the transfer situation was remote from the original learning situation. In mapped transfer, the learner seemed to associate ideas from one situation as appropriate for another situation that is often quite remote from the original.

Examples that illustrated mapped transfer clarify this coded behavior. S_4 exemplified mapped transfer by developing a People Search questionnaire tailored to the topics of his adult evening real estate class. By carrying this modeled instructional strategy into a teaching situation outside his regular high school curriculum, S_4 demonstrated the deliberateness of transfer into different situations that differentiated mapped transfer from other types of complex transfer. Mapped transfer seemed to rely on this association of ideas and incidents.

This mapped transfer was further exemplified by S_5 in a videotaping session in which students were paired into coaching partners. In preparation for their juvenile literature presentations in primary classrooms, the partners observed and coached each other as they re-

hearsed for a final video-taping of their presentation. The video-tapes were then used to self-critique their performances. This evaluation technique was deliberately mapped into the classroom as a viable student strategy for self-monitoring as a result of the training segment on coaching partners and video-taping as a teacher strategy. By associating the techniques demonstrated in the original situation which was targeted toward teacher monitoring, and mapping the strategy into a very different situation of student monitoring, the transfer was deliberately associated and used to carry an idea into an entirely new situation. This distinguishes the mapped transfer coding.

Innovated Transfer

Another level of complex transfer was coded as innovated transfer. Incidents were coded as innovated transfer if the transfer behavior indicated divergence or novelty from the originally modeled behaviors.

A clear example of innovated transfer was illustrated by S_5 as she led students to metacognitively process their behavior during a test review class. Diverging from the modeled questions that cause students to become aware and accept control over their own behavior, S_5 lead them into processing not just the one class incident but to processing typical human behavior in general. S_5 asked leading questions about attitudes and initiative and how they differed depending on the day of the week (ie. Monday vs. Friday, Friday vs. Saturday) as well as how they differed depending on the weather) bright sunny vs. cold, rainy days). This macro-processing diverged greatly from the micro-

processing modeled in the training, therefore the incident was coded as innovated transfer.

A further example of innovated transfer occurred as S_4 diverged with an inductive matrix strategy and tailored it into a deductive classification technique. By reversing the strategy, S_4 diverged dramatically from the original model and invented a new model and use for the original strategy. This innovated transfer was coded whenever an incident of obvious divergence occurred. The creative divergence and the innovative results distinguishes this level of complex transfer.

Summary

In sum, the delimiting of the theory on creative transfer led to a continuum of transfer that depicted degrees of both simple and complex transfer and a continuum of creativity related to degrees of risk. Simple transfer seemed to contain levels of both intentional and unintentional omission, duplicated transfer and replicated transfer. The levels of creative activity appeared to be low risk behaviors of persisting in former ways, observing keenly and differentiating relevant factors. At the other end of the spectrum complex transfer seemed to fall into three distinct positions of integrated transfer, mapped transfer and innovated transfer. At the same time, the differentiated levels of complex transfer seemed linked to specific creative characteristics. Integrated transfer seemed to occur as the learner combined new ideas and old ideas subtly, while mapped transfer seemed to depend on the learners ability to associate ideas in one situation to ideas that were applicable in very different situations. In addition, in-

novated transfer seemed to occur in some relationship with the learners ability to diverge from the original concepts.

The delimiting of the theory of transfer described above led to several conceptualizations about transfer and creativity. In examining the various degrees of both simple and complex transfer as well as specific behavior indicative of creative behavior, a continuum of behavior seemed more appropriate a representation than learner type compartments. However, in order to represent the creativity factors that seemed linked to the degrees of complex transfer, an additional continuum was needed. The emergent graph placed the transfer continuum as the x axis and the creativity continuum as the y axis on a single grid. See Figure 10.

Also, in examining the various degrees of the many incidents coded for both simple and complex transfer, a key element that seemed to emerge was the transfer situation itself. For this reason, the graphic depiction of the delimited theory was entitled situational dispositions toward transfer. This conceptualization diverges from the previously discussed theory of learner types or the idea of predisposition toward transfer. This emergent theory that evolved during the delimiting of the theory phase of Glaser's (1965) model is discussed further in the subsequent section and in the final chapter.

Phase IV: Writing The Theory: Transfer/Adult Learner/Creativity

Glaser's (1965) Constant Comparative Methodology calls for final categories to be used as the major themes of the proposed theory. These themes were summarized and the relationships among them were analyzed and discussed.

The findings of the study were synthesized into three major themes. The first theme suggested that observed transfer in adult learners seemed to parallel the accepted theories of simple and complex transfer, but adult learners appeared to follow a continuum of behavior rather than a compartmentalization into the two arenas. The second theme suggested that observed transfer in adult learners defined as situational dispositions toward transfer rather than intuitive, natural predispositions toward transfer would be a more accurate representation of the behaviors. Thirdly, the theme of transfer dispositions paralleling creative dispositions in adult learners seemed to be suggested by the findings of the study.

To help clarify the relationships among these three theories, the accompanying figure provides a graphic display of the findings that were subsequently discussed. A synthesis of the findings and results of the study followed.

Figure 11. Phase IV: Writing The Theory

Theory of Adult Creative Transfer		
Theories of Transfer Behavior	Observed Adult Learner Behavior	Theories of Creative Behavior
INVENTS Fullan: innovates Perkins & Salomon: invents Joyce, Hersh, & McKibbon: omnivores Beyer: elaborates Posner: exquisite solution	**INNOVATES** Creates beyond original idea; novel S_5	**DIVERGES** Anderson Guilford: inventive, designing; Rogers: unique; C. Taylor: risks; Thurston, Davis: insightful; Torrance, Stein: novel Barron, MacKinnon, Taylor: sees as others do not, imagination
BRIDGES Joyce, Hersh, & McKibbon: active consumer Wittrock: remote Perkins & Salomon: portable Sternberg: guided; scaffolding Feuerstein: mediate Joyce & Showers: vertical	**MAPS** S_4 Consciously carries into new content and situations S_3	**ASSOCIATES** Parnes Spearman: transfers relationships Torrance, Anderson: flexible Guilford: sees patterns
ABSTRACTS Perkins & Salomon: Abstracts Joyce & Showers: not added; integrated Pullan: deep understanding	**INTEGRATES** Refines what is already doing S_2	**COMBINES** Parnes Barron, MacKinnon, Taylor: holds many ideas C. Taylor: resourceful Anderson: integrates Torrance: elaborates, fluent
HUGS Perkins & Salomon: low road Wittrock: near Joyce & Showers: horizontal Sternberg: spontaneous	**REPLICATES** Applies in similar content; tailors to kids and content S_1	**DIFFERENTIATES** Anderson C. Taylor: sense ambiguities; Anderson: discarding irrelevant; Jackson: appropriateness, adapts
PRACTICES Joyce, Hersh & McKibbon: entrenched, passive Posner: novice Beyer: similar Hunter: similar Thorndike: similar	**DUPLICATES** Drills exactly as learned and practiced	**OBSERVES** Taylor Barron, MacKinnon, Taylor: observant; C. Taylor - keen observer
MISSES Joyce, Hersh & McKibbon: withdrawn Fullan: no change	**OVERLOOKS** intentionally or unintentionally	**PERSISTS** Smith Smith: continues previous behavior C. Taylor: awareness when doesn't know Kagan: conventional Smith: inactive

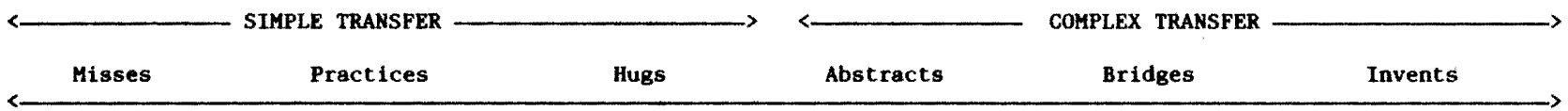
COMPLEX TRANSFER ↕ SIMPLE TRANSFER

HIGH RISK ↕ LOW RISK

Theme I: The Transfer Continuum

Using the figure that displayed the Theory of Adult Creative Transfer as the master blueprint, the theories of transfer in the far left column are discussed first. Based on the emergent theory that the observed transfer in adult learners seemed to parallel the accepted theories of simple and complex transfer and appeared to follow a continuum of behavior beyond the dual compartmentalization, adult learners evidenced behaviors from no transfer to complete metamorphosis.

Figure 12. Theories of Transfer



Misses	Practices	Hugs	Abstracts	Bridges	Invents
Joyce, Hersh, and MacKibbon "Withdrawn"; low conceptualizer	Joyce, Hersh, and MacKibbon "entrenched"	Perkins and Salomon low road	Perkins and Salomon abstracts	Perkins and Salomon portable	Perkins and Salomon invents
Fullan change is what the teacher does, Does nothing, no change	Beyer similarity	Joyce and Showers horizontal	Joyce and Showers integrated not actually added	Joyce and Showers vertical	Joyce and Showers high conceptualizer
Hunter negative transfer	Hunter similarity	Joyce, Hersh, and MacKibbon "passive consumer"	Fullan deep understanding	Joyce, Hersh, and MacKibbon "active consumer"	Joyce, Hersh, and MacKibbon omnivore
	Posner novice stage	Sternberg spontaneous		Feuerstein mediated	Beyer elaborates
	Thorndike similarity	Wittrock near		Wittrock remote	Fullan innovates
				Sternberg guided, scaffolding	Posner exquisite solution

Beginning with the minimum transfer behaviors listed under the broad umbrella of simple transfer, some adult learners seemed to miss the opportunity for transfer entirely in some situations. Joyce and Showers (1988) referred to this learner as a low conceptualizer; withdrawn from the activity. Fullan (1982) alluded to the "no change" learner in a broad sense when he talked about educational change. He noted that change is what the teacher does and if the teacher does nothing different, there is in fact, no change.

Moving along the continuum, but still in the area of simple transfer, to the next level of transfer noted in the literature, Thorndike (in Tyler, 1987), Hunter (1982) and Beyer (1987) all referred to the learner who practiced the new skills or strategies in very similar situations. As researchers on transfer, they felt that the similarity of the learned skills to the new situation was a critical element. Posner (1973) called the learner in this stage of transfer the novice. Joyce and Showers labeled this learner, entrenched, believing that the entrenched learner must have drill and practice with the new skill in order to transfer it into the classroom. This second level of learner transfer was characterized by drill and practice both in the training setting and then in the work setting.

The third level of transfer (see Figure 12), still considered simple transfer, hugs the originally learned skill or strategy, yet this transfer behavior went beyond simple practice of learned skills as some new element was included by the learner for application. Perkins and Salomon (1988) labeled this low road transfer, while Wittrock (1967) refers to it as near transfer. Additional references in the

literature are noted by Sternberg (1984), who spoke of spontaneous transfer and Joyce and Showers, whose term horizontal transfer depicted this level.

Just as theories of simple transfer were redefined into the three sub-categories of 1) misses, 2) practices and 3) hugs, complex transfer also spanned a spectrum that suggested further refinement.

The learner who grasped the essence of the skill as strategy and subtly integrated it into his/her teaching abstracts ideas from the training. Perkins and Salomon (1986) noted this abstracted behavior as a higher level of transfer or high road transfer, while Joyce and Showers (1986) referred to this phenomena as an integrated skill, not consciously added to the teaching repertoire as learned. This learner was a high conceptualizer according to Joyce and Showers (1988) and was depicted on the continuum as approaching more complex transfer as evidenced by a keen sense sifting the new learning into the former behavior(s).

A more deliberate transfer was noted in the literature as the learner bridges new learning into his/her teaching repertoire or life situations. Joyce and Showers referred to this as vertical transfer by the "active consumer." While the high conceptualizer who abstracted information and subtly infused it into his/her conventional behavior through a raised consciousness, the bridging transfer was carried consciously with what Wittrock (1967) referred to as remote transfer. Perkins and Salomon (1988) also noted this behavior and described a learner who saw the skills and strategies as portable ideas that were moved into appropriate situations. Sternberg's (1986) guided transfer

which was supported by preconstructed scaffolding seemed to refer to this bridging behavior just as Feuerstein's (1980) mediated strategies did.

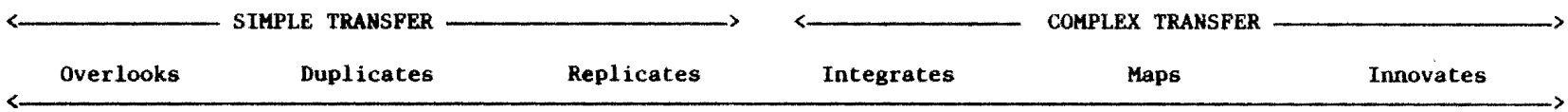
The highest level of complex transfer described in the literature was defined by Joyce and Showers (1988) as a high conceptualizer whose behavior paralleled that of the "omnivore." This learner took in everything and invented (Perkins and Salomon, 1988), innovated (Fullan, 1982), and elaborated (Beyer, 1987). Posner (1973) described this learner as the expert who produced an exquisite solution. This learner executed complex transfer by going beyond the initial learning in innovate ways.

By redefining the existing transfer theory into degrees of simple and complex transfer, the range of adult learner behavior was clarified. This clarification in how adults take the learned skills and strategies into the workplace can be enlightening to both the learner and the trainer in terms of facilitating meaningful transfer.

Theme 2: Learner Situational Dispositions Toward Transfer

The second conceptual theme, the observed continuum of transfer in adult learners can be defined as situational dispositions as well as predispositions, was displayed on the accompanying chart (Figure 13).

Figure 13. Observed Adult Learner Dispositions Toward Transfer



Ollie-Head-in-Sand Ostrich	**Dan the Drilling Woodpecker**	**Laura the Look-Alike Penguin**	**Jonathan Livingston Seagull**	**Cathy the Carrier Pigeon**	**Samantha the Soaring Eagle**
Unaware of relevance; Overlooks appropriate applications; does not change in any way; intentional or unintentional	Drills and practices exactly as presented, then stops, unsure how to generalize beyond initial activity; Duplicates	Applies in similar content; one narrow road; all look alike; not transferred to new situations. Replicates	Raised consciousness; acute awareness; deliberate refinements; Integrates subtly.	Consciously transfers ideas to various situations, contents; carries strategy as part of available repertoire; generalizes; Maps.	Innovates; flies with an idea; goes beyond initial concept; creates, enhances, invents, risks.
Verbal cues "Great ideas, but this won't work with my kids or my content; doesn't apply to me."	**Verbal cues** "Could I have a copy of that?"	**Verbal cues** "I use this strategy every time I introduce the lesson."	**Verbal cues** "I've always done this, but I'm doing more with it."	**Verbal cues** "I use the idea for everything both in and out of school."	**Verbal cues** "You have changed my teaching forever."
Situational Dispositions of Subjects	S_1 ——>	S_2 ——>	S_3 ——>	S_4 ——>	S_5

Specific bird metaphors depicted the various dispositions of the observed adult learners in order to image and clarify the descriptions presented (Figure 13). In addition to the metaphorical reference, the behavior was explained and defined. Brief references to the subjects situational dispositions were made. Also, verbal cues of teacher trainers were noted that signaled the transfer behavior.

Following a comprehensive explanation of the observed transfer behavior, the concept of dispositions that appeared to be situational in nature was discussed, thus concluding the discussion of the second theme of learner situational dispositions.

Ollie the Head-in-the Sand Ostrich

Beginning with the absence of transfer on the far left of the continuum, (Figure 13) Ollie the Head-in-the Sand Ostrich was depicted as the adult learner who overlooked opportunities for transfer. Ollie the Ostrich learners were disposed to do nothing new as a result of the training. They seemed unaware of the relevance and overlooked appropriate applications. It was as though the "shot didn't take."

Verbal cues of this disposition were: "Great session, but this won't work with my kids or my content." The nomination procedures used in sampling apparently screened out the Ollies, as there was no evidence of this learner disposition in the subjects studied.

Dan The Drilling Woodpecker

Dan the Drilling Woodpecker signified the second disposition on the continuum. This learner disposition reflected behavior of simple transfer in which the learner drilled and practiced the skills and

strategies exactly as they were presented in training. The transfer became drill, drill, then it ceased entirely.

Dan the Drilling Woodpecker learners halted unsure what to do next. They tried the newly learned skill or strategy as practiced, but seemed unable to advance beyond the idea of one new activity. They seemed unable to generalize or extract a generic pattern from the learning. They copied or duplicated the learned skill or strategy, with almost no changes. Subsequently, the duplication which had not been personalized became stale or inappropriate with no general use.

Verbal cues to this learner disposition were, "Could I have a copy of that?", indicating that the learner saw duplication as the strategy for transfer. Movement beyond this seemed unlikely since the learner disposition was to use as was, with no personalization or internalization of the concept.

Laura the Look-Alike Penguin

The third disposition, in which the learner applied the new learning in one narrow area, was depicted by the Laura the Look-Alike Penguin. Applications were restricted to one content area or very similar situations, but the learner was not likely to transfer the learning into new content or novel situations. However, unlike the Drilling Woodpecker disposition, this learner replicated the learning, by adding something to the originally modeled behavior. The replication modified the learned skill or strategy in order to personalize it. By replication, going beyond duplication, Laura the Look-like Penguin adapted the new ideas in personally relevant ways.

A verbal cue to this disposition was the learner who said, "I use the strategy all the time to introduce a skill." This replication was a modification, but not a true generalization as a generic strategy that might be as effective to review material as it was to introduce information.

In this study, S_1 seemed to replicate skills and strategies frequently as modifications were made for her content of French. However, there was no evidence of complex transfer in which the new learnings were applied extensively as standard additions to her teaching repertoire.

Jonathan Livingston Seagull

Moving into the fourth disposition evidenced by teachers in the study, Jonathan Livingston Seagull was the metaphor chosen to depict this learner. This disposition had not been envisioned in the hypothesized learner types. Yet, after constant analysis of the observation data, there seemed to be a learner disposition represented in which the learner assumed an acute awareness or raised consciousness concerning the concepts presented in training. The learner disposition depicted as Jonathan Livingston Seagull, did not actually evidence the new skill or strategy overtly or explicitly. However, by subtly integrating the concepts into existing skills and strategies, this learner seemed to deliberately refine former behaviors.

In the study both S_2 and S_3 seemed to fit this Jonathan Livingston Seagull disposition. Refinements were observed and also self-disclosed in conversations with the researcher. Both seemed reaffirmed in their teaching expertise and talked about being more aware. S_3 was

especially interested in the cognitive vocabulary to label her teaching behaviors.

Verbal cues to this learner disposition were, "I haven't used any of your ideas exactly, because I've always done this. But I'm more aware and I'm doing it more often." This learner disposition was placed at the beginning of the complex transfer stage because the statement of not using the ideas because they were not new appeared to be a disclaimer attached to the risk factor. This learner seemed to need self-assurance that he/she was an expert. There seemed to be the hint of threat in the idea that as an expert he/she should have known the training material beforehand.

Cathy The Carrier Pigeon

Moving beyond the raised consciousness disposition, to deliberate and strategic transfer, Cathy the Carrier Pigeon maps the new skills or strategies into a variety of situations and content. This disposition, depicted the learner who consciously applied the new learning by generalizing and mapping. This learner used the new skills and strategies both in a variety of academic areas and in real life situations. There seemed to be a strategic approach to carrying the learner across diverse contextual situations. S_4 evidenced this disposition in the study. He consciously mapped explicit skills and strategies into his regular classes as well as into his adult classes and his summer school elementary classes. In addition, he mapped the strategies into his presentations as a conference presenter.

Verbal cues to this disposition were, "I have used that skill or strategy with all my groups. I've even used it with my adult class and

with my own children." The applications were varied and the opportunities for application were diverse. This learner generalized and extracted relevant meaning from the learnings. Each new piece became an addition to an ever-expanding repertoire.

Samantha the Soaring Eagle

At the far right of the spectrum of dispositions was the learner who "leaps to transfer and beyond." This learner seemed to take the seed of the idea and innovated far beyond the initial concept. This learner seems disposed to create, invent, and enhance every new idea by extrapolating the essence and flying with the idea. This learner disposition, at the extreme position on the continuum accepted the high risk factor that accompanied novel ideas.

S_s exhibited behavior nearest this disposition in overall performance observed. She consistently drew from many sources, and applied the strategies and skills with novelty. She admitted to awareness of the risk involved in some of her undertakings in terms of peer approval, but seemed secure in her beliefs and practices. Although her content area of home arts has an inherent practical nature, the cognitive skills and strategies seemed effortlessly applied with creativity and insight.

Verbal cues to this disposition were, "You have changed my teaching. I'm excited about the new ideas and how they have energized my lessons." This disposition seemed to become a metamorphosis for some learners.

Situational Dispositions

While the subjects were selected by a nomination process that screened for subjects who seemed predisposed to creative transfer, as the study unfolded another dimension evolved. The transfer behavior seemed linked as much to the specifics of the situation pervading each learner as to preconceived perceptions of predispositions toward creative transfer.

To clarify this point, a closer look at the terms is warranted. In nominating candidates for the study, the criteria of "seems most likely to leap to transfer and beyond" presumed a predisposition toward creativity and transfer. Predisposition was defined as an inclination toward something in advance. Accordingly, subjects who were nominated were perceived to possess the inclination toward transfer.

Yet, in the study, as the transfer behavior was observed, coded and analyzed, the concept of situational dispositions became an important aspect to consider. For as the evidence accumulated and the continuum of behaviors evolved, the range of creative transfer, even in this preselected sample, seemed noteworthy.

To rationalize this wide range of transfer behavior within this select group of learners "predisposed" to creative transfer, the concept of situational disposition was used. The term situational takes into account the many learner variables from personal concerns and mental/physical states of learners to attitudes about relevance of content and trainer style.

Coupling the concept of situational relevance with the concept of dispositions, rather than or in addition to predispositions provided a

rationale for the range of learner behaviors observed in the study. The concept of dispositions was defined as temperament or tendency toward something. While it seemed a fine line between the concept of predisposition and disposition, the idea of situational dispositions seemed to most precisely capture the observed learner behaviors in the study.

This terminology also suggested that at certain times, under certain circumstances learners are more likely to exhibit tendencies toward creative transfer. The idea that situations and learners were not static or neatly compartmentalized appealed to the educational researcher who understood the unpredictable nature of human beings. The concept of situational dispositions seemed most appropriate for imprecisions that accompany human nature.

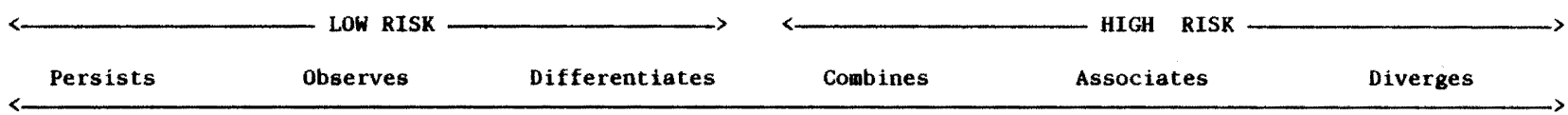
In sum, the second major conceptual theme emphasized the continuum of dispositions witnessed in the study and the concept of those dispositions as situational in nature. The various dispositions included overlooking, duplicating and replicating transfer behaviors at one end of the continuum labelled simple transfer to integrating, mapping and innovating transfer behaviors at the other end labelled complex transfer. Brief mention was made delineating where the subjects of the study seemed to fall on the continuum and definitions clarifying the terminology of situational dispositions were discussed.

Theme 3: Transfer and Creativity Parallel Dispositions

The observed transfer dispositions in adult learners seem to parallel similar creative dispositions was the third conceptual theme

of the study. To describe this concept the accompanying chart represented the key elements (Figure 14).

Figure 14. Personality Characteristics of Creative Behavior



Smith: continues previous behavior; C. Taylor: awareness when doesn't know; Kagan: conventional; Smith: inactive, persists	Barron, MacKinnon, C. Taylor: keen observer; Taylor: observant	C. Taylor: sense ambiquities; Jackson: appropriateness, adapts; Anderson: discarding irrelevant, differentiates	Barron, MacKinnon, Taylor: holds many ideas; C. Taylor: resourceful; Anderson: integrates; Torrance: elaborates, fluent; Parnes: combines	Spearman: transfers relationships; Torrance, Anderson: flexible; Guilford: sees patterns; Parnes: associates	Guilford: inventive, designing; Rogers: unique; C. Taylor: risks Thurston, Davis: insightful; Torrance, Stein: novel; Barron, MacKinnon, Taylor: sees as others do not, imagination; Anderson: diverges

Personality characteristics reflected in the literature have been placed on the continuum from low risk behaviors to high risk behaviors. The risk factor became the anchoring concept. Risk taking was repeatedly mentioned in the literature in relation to creativity and the spectrum of both transfer theories and situational dispositions to transfer that were observed in the study seemed to parallel the range of risk-taking. A brief description of the creative dispositions followed. In addition, reference to the subjects of the study and the degree of creativity observed was linked to the various traits. Also, a discussion of the creative traits that the subjects had in common concluded the discussion of the third thematic concept.

Persisting Behavior

At the low risk end of the spectrum, was the disposition of persisting or continuing conventional behavior. This creative disposition signified an inactive or passive stance in which the learner virtually took no risk since he/she made no shift or change in teaching behavior.

The nomination process seemed to screen out the more extreme persisting learners, as there was no overt evidence of this creative disposition in the subjects under study.

Observing Behavior

Still in the low risk end of the continuum of creative behavior, the observing disposition differed significantly from the persisting stand. In this observing behavior, the learner exhibited keen observation skills. The learner assuming this disposition detailed the new

skills and strategies and substituted former behavior with exact duplication of the new learnings. This was depicted as creative behavior, even though on the surface it appeared to be mere duplication, because creativity involved this skill of keen observation. Coupled with this talent for noting details was the ability to use it as one's own, thus, providing a subtle level of creative transfer.

Again, perhaps as a result of the screening process, the subjects studied did not fall into this disposition. The creative dispositions evidenced were in the subsequent categories on the continuum.

Differentiating Behavior

The learner who discarded the irrelevant, modified and adopted cautiously was depicted by the disposition entitled differentiating behavior. This learner seemed able to select the relevant information and gingerly personalize the skill or strategy to suit his/her specific needs.

However, this creative disposition rested in the low risk end of the spectrum since no major changes were made. Only minor adaptations were applied by the learner to tailor the learning for immediate and relevant use.

An example of differentiating behavior was evidenced with S_1 as she modified material by translating it into French. However, the actual content of the modeled material did not change significantly. A further example of this differentiating behavior was in taking material directly from the text and incorporating this verbatim into a learned strategy. There was minimal creativity employed, yet just enough was

altered to make the material more relevant and useful to the learner's particular situation.

Combining Behavior

Beginning the high risk end of the spectrum, the fourth creative disposition was represented by the combining behavior exhibited. This learner seemed to have a tolerance for complexity. Fluent with ideas, this learner found it easy to combine new information with old information. He/she elaborated by combining bits of this and that and can put ideas together in new ways.

Examples of combining behavior were exhibited frequently by S_2 and S_3 as they combined the trained and modeled ideas with their former teaching techniques. The resulting strategies subtly reflected the new learnings, but were seldom executed explicitly. Rather, the new information was sifted lightly into existing behavior.

This combining behavior seemed to have some risk factor connected to it, since the learner was venturing into refinement of previous skills. However, the risk was considered somewhat safe as the new ideas were heavily anchored to proven techniques.

Associating Behavior

Moving toward the higher risk end of the spectrum, the creative disposition of associating ideas was displayed. This learner was highly curious. He/she was flexible in his/her ability to put ideas to other uses. This learner associated ideas with ease and consciously strategizied how he/she might get more mileage from an idea. This learner was willing to risk using a new idea in an entirely new set-

ting. In fact, this learner seemed to relish in the risk with an experimental attitude that suggested a taste for adventure.

The flexibility of this learner to change directions and deliberately "chance it" was evidenced in S_4. His willingness to try the ideas in front of his peers in a statewide convention suggests his appetite for change and his acceptance of risk.

Diverging Behavior

At the far end of the high risk area of the spectrum, was the creative disposition depicted as diverging behavior. This is the learner who synthesized easily, had insight into new situations, rearranged or reversed the modeled strategies and skill lessons. He/she saw ideas as others did not. This learner was bold in his/her applications, adventuresome in attitude and original in execution. The diverging disposition was a high risk position, open to criticism because the learner stepped far out from the norm.

This creative disposition was evidenced by S_5 in the study. Undaunted by peer critics, she consistently planned and adjusted her teaching to the needs of her students. Opening herself to supervisory scrutiny, she put into practice her belief in the student over content. This is high risk in an affluent suburb where high achievement ranks first.

Commonalities of Creative Characteristics in Subjects

While each of the subjects exhibited creative dispositions at various points on the continuum, the subjects studied also exhibited several traits in common that seem noteworthy.

All five subjects showed an expertise in their content area. They had broad depth of knowledge in their chosen disciplines and were highly respected by their peers and their supervisors as skilled practitioners.

The five subjects studied revealed an enthusiasm for their content area that bordered on passion. They were involved in their professional field beyond the classroom and were recognized as experts in their respective fields.

Another interesting characteristic was the diversity of backgrounds, age, years of experience and other interests. They all seemed to have "many irons in the fire" and seemed to carry the same enthusiasm into every area.

The subjects studied devoted many hours outside of the school day to various projects both related and non-related to the primary teaching role they served. Some had written books, traveled extensively, coached, performed professionally and carried additional career obligations.

In sum, the participants in the study seemed to be rich in background experience as well as in present endeavors. This creative richness seemed to spill over into their use of the newly acquired skills and strategies.

Theory of Learner Situation Dispositions

Adult learners seemed to exhibit a continuum of dispositions toward creative transfer that appeared to be situational in nature.

Figure 15. Creative Transfer In the Adult Learner

	Transfer Theories	Observed Behavior	Creative Characteristics
F	Invents	Innovates	Diverges
E	Bridges	Maps	Associates
D	Abstracts	Integrates	Combines
C	Hugs	Replicates	Differentiates
B	Practices	Duplicates	Observes
A	Misses	Overlooks	Persists

Based on the study, Figure 15, there appeared to be a definitive relationship between theories of transfer and creativity. The middle column of the figure, labelled "observed behavior" linked the left column, transfer theories to the right column, creative characteristics. A brief discussion of how these elements seem to connect concluded the analysis and verification of data detailed in this chapter. Again, referring to the chart displayed in Figure 15, and reading horizontally across the columns, the row designated as "A" implied that in missing the understanding or relevance of the newly learned skill or strategy the learner overlooks appropriate opportunities for transfer and persists in traditional or former behavior. No change was evidenced in the teaching repertoire.

Row B suggested that according to transfer theory, the learner practices a newly learned skill and duplicates it in the training or work setting by observing the details of the model. This learner

disposition inferred simple transfer of a learned skill to a very similar situation in the training session or in the classroom.

Still executing simple transfer Row C depicted the learner who hugs the newly learned skill and replicates it by differentiating the relevant and irrelevant elements. This learner disposition personalized the idea by modifying it slightly to fit his/her individual needs.

By abstracting the essence of an idea, Row D depicted the learner who subtly integrates new ideas into an existing repertoire by combining elements of the new skill or strategy into the former, proven behaviors. This learner disposition entered into the more complex transfer arena with a higher risk factor than the previously described three. As this learner became more acutely aware of the meaning of the new information, he/she reacted with a raised consciousness to the traditional techniques. By infusing some new elements into the existing strategies, this learner risked a shift in emphasis.

With more assertiveness, the learner represented in Row E deliberately bridges new material by strategically mapping the skills and strategies into his/her teaching repertoire through elaborate association of ideas. This learner was well-within the realm of complex transfer and high risk factors since he/she consciously decided to experiment in new and varied situations both within the academic areas and in real life situations.

Finally, the highest complexity of transfer was represented in Row F, by the learner who invents novel applications and innovates by diverging greatly from the training model. This learner accepted the high risk factor of changing the model. He/she boldly rearranged or

reversed the conceptual learning with insight and creativity. This learner relished in the novel and assumed an attitude of adventure and daring.

In sum, the theories of transfer and creativity seemed to be aligned with the observed behaviors of the adult learners studied in the training. Through an analysis of the accepted theories of transfer and creativity and by defining the critical element in each, the findings in the literature seemed to match the findings in the study.

Chapter 5 continued with a final look at the hypothesized research questions and the actual findings of the study. Further, some conclusions were drawn, limitations of the study were noted and questions for further research were suggested.

CHAPTER V

DISCUSSION OF RESULTS

> Perhaps the greatest of all pedagogical fallacies is the notion that a person learns only the particular thing he is studying at the time (John Dewey in Eisner, p. 74).

This chapter contains a comparison of the hypothesized learner types and the observed situational learner dispositions as well as a summary of the findings of the study. In addition, conclusions are drawn about the results and a discussion of implications is included. Further a statement of the limitations of the study is made. This chapter concludes with suggestions of related questions that warrant further research.

Hypothesis Reviewed

The purpose of the study, From Training To Transfer: The Role Of Creativity In The Adult Learner, was to examine cases of adult learners in which transfer and/or creative innovation seemed to occur spontaneously and naturally. The researcher set out to look closely at adult learners who were most likely to "leap to transfer and beyond;" the adult learners who were inclined to generalize and extrapolate generic meaning from the training models.

By examining cases of teachers with high tendencies toward transfer, it was hypothesized that this predisposition for transfer in the

adult learner was linked to creativity. It was further conjectured that if, in fact, creativity was found to be a key element in transfer that this finding could have direct implications for staff development training models.

While the purpose of the study was not to judge one teacher as better than another, the researcher proposed to compare a cluster of five cases of individual teachers who seemed predisposed to "leap to transfer and beyond." It was further theorized that patterns would emerge from the study of five cases that would suggest elements or conditions that allow, encourage, permit, foster and invite creative transfer in adult learners.

Based on the previous experience of the trainer/researcher, five learner types were also hypothesized. The learner types suspected to emerge from the analysis of the study were:

Type 1: Head-in-Sand: Does Nothing

Type 2: Drilling Woodpecker: Practices Exactly

Type 3: Look-Alike Penguin: Applies Similarly

Type 4: Carrier Pigeon: Transfers Relevantly

Type 5: Soaring Eagle: Innovates Creatively

Hypotheses Compared To Findings

To summarize the findings of the study, it is first necessary to compare the hypothesized learner types with the findings of the actual learner observations. Figure 16 is used to graphically display the comparison.

Figure 16. Hypothesized Learner Types Compared To Observed Situational Learner Dispositions and to Bloom's Taxonomy of Cognitive Objectives

Bloom's Taxonomy	Hypothesized Learner Types		Transfer Theory	Observed Learner Dispositions (Situational)	Creative Characteristics	
Evaluation	Type 5: Soaring Eagle Innovates	COMPLEX TRANSFER	Invents	Innovates	Diverges	HIGH RISK
Synthesis	Type 4: Carrier Pigeon Relevant Transfers		Bridges	Maps	Associates	
Analysis			Abstracts	Integrates	Combines	
Application	Type 3: Look-Alike Penguin Applies, but similar look	SIMPLE TRANSFER	Hugs	Replicates	Differentiates	LOW RISK
Comprehension	Type 2: Drilling Woodpecker Practices		Practices	Duplicates	Observes	
Knowledge	Type 1: Head-in-Sand Does Nothing		Misses	Overlooks	Persists	

While the five learner types hypothesized are in fact represented in the findings, the results provided further elaboration and clarification. Comparing only the two columns that represent the hypothesized learners and the observed learners, the refinement in observable behaviors becomes more clear.

Figure 17. Comparison of Hypothesized and Observed Learner Outcomes

Hypothesized Learners	Observed Learners
Innovates Creativity Type 5	Innovates
Transfers Relevantly Type 4	Maps
----	Integrates
Applies Similarly Type 3	Replicates
Practices Exactly Type 2	Duplicates
Does Nothing Type 1	Overlooks intentionally/unintentionally

Learner Type 1 defined initially as Head-in-the Sand: does nothing was redefined as Ollie, Head-in-the Sand Ostrich, who intentionally or unintentionally overlooks the opportunity for transfer. Learner Type 2, defined as Drilling Woodpecker: practices exactly, was redefined as Dan the Drilling Woodpecker, who duplicates or copies the modeled behavior. Learner Type 3, defined as Look-Alike Penguin; who

applies the new skills and strategies in very similar ways, was redefined as Laura the Look-Alike Penguin, who replicates the learned skills by modifying slightly for personal relevance.

In addition to redefining the above mentioned learner types, the study results placed these three learner types in the category of simple transfer, which implies transfer in similar or near similar content and contexts.

Moving to the next level on Figure 17, and not mentioned in the hypothesized learner types, but evidenced in the observed learners was the learner who subtly integrates new information into former behavior. No explicit transfer is evident, but this learner, labelled Jonathan Livingston Seagull is defined and placed in the beginning of the complex transfer range since the integration of new learning required a higher level of conceptualization than either replication or duplication.

Learner Type 4, defined as Carrier Pigeon, transfers relevantly is redefined as Cathy, the Carrier Pigeon, who consciously carries or mapped the newly learned skills or strategies into diverse settings. And finally, Learner Type 5, defined as Soaring Eagle: innovates creatively is further defined as Samantha the Soaring Eagle who creatively innovates with the new learnings.

Both Learner Type 4 and Learner Type 5 are placed in the complex transfer range on the continuum, since both learner types exhibit high conceptual skills and high levels of abstraction in executing transfer into remote situations.

Further analysis of the more complete Figure 17 suggests the relationship of the newly defined learners to both transfer theory and creative characteristics. The relationships depicted in the chart implies that simple transfer occurs with low risk for the learners who overlook, duplicate or replicate learnings. Transfer theory depicts these learners as missing, practicing or "hugging" the new learning. These learner types persist in old ways, observe in detail and differentiate relevant data from new learnings. These are seen as somewhat passive behaviors with low risk factors.

By contrast, learners who exhibit complex transfer are seen as exhibiting high risk factors. These learners integrate, map and innovate with ideas. Transfer theory depicts these learners as abstracting, bridging or inventing with newly learned skills or strategies in remote or unique situations. Similarly, the creative behaviors involved are combining and associating ideas and diverging greatly from the original learning by creatively rearranging or even reversing ideas.

In addition to the described comparisons between the hypothesized learners and the observed learners, a revision in terminology signals a significant refinement to the hypothesized conceptualization of learner types. After careful analysis, the term learner types is shifted to reflect the idea of a situational aspect to learner transfer. The original term, learner type seems to imply a predisposition to transfer while the findings suggest situational dispositions toward transfer.

The term, situational disposition, allows for a theory of transfer in adult learners that considers a complexity of factors that

influence the adult disposition toward transfer in any given situation. It implies that the tendency is situational and varied depending on any number of circumstances including personal concerns, type of training, training style, and learner attitude. The adult learner is viewed more holistically and humanely by using the term situational disposition, whereas the term learner type implies a static stance, which locks the adult learner into one definitive mode.

Conclusions

By reviewing the summary of the findings depicted on Figure 17, several conclusions are drawn from the study. First and foremost, the findings seem to indicate that a link between complex transfer and creativity does exist. In addition, it is concluded from the findings of the study, that a continuum of situational dispositions toward transfer are represented by the adult learner. In addition, a correlation between the findings and Bloom's Taxonomy of Cognitive Objectives seems to exist.

Implications

Knowing that creativity is a significant attribute of learners disposed toward complex transfer suggests implications for both the individual learner as well as for staff development. It seems likely that by making learners explicitly aware of the link between creative behavior and transfer behavior, that the individual is more inclined to risk and diverge in order to incorporate new skills and strategies as he/she strives to achieve what the "authorities" expected. By making explicit the connection between creativity and transfer, the learner

plication of new learnings. This expressed expectation not only raises the learner's self-expectations for transfer but also raises the learner's awareness of this complex process called transfer.

Following the theory of metacognitive behavior, awareness of one's behavior precedes control over one's behavior. Thus, it follows that adult learners who are made aware of the need for creativity in relationship to meaningfully relevant and innovative transfer are more likely to meet that expectation.

Regarding individual learner expectations, another dimension that is implied in the study is the need to transmit transfer expectations to the learners. Taking lessons from business and industry, when employees are trained at the employer's expense, there is the explicit expectation that the employee will transfer the learned skills to the job immediately following training. This expectation seems less explicit in the educational setting.

In working with the teachers in the study, one teacher alluded to the issue by suggesting that perhaps she should have tried a strategy from the training for my first visit. It was almost as if this "after thought" that occurred, surprised her. There had been no clear expectation received by her that, of course, on-the-job transfer had been expected.

A further implication for individuals involved in staff development trainings is the inclusion of discussions about individual situational learner dispositions in the peer coaching process. Both the individual's awareness of his/her own behavioral disposition toward transfer and his/her peer coach's understanding and reflection on the

learner's evidenced level of transfer could provide complementary information to skill development during the coaching process.

For example, the learner exhibiting duplicated transfer could be coached toward replication or integration, thus moving the learner into more complex levels of transfer. In this way, both the learner and the coach monitor the continuum of transfer behavior and mutually set expectations and goals for increased complexity. A processing sheet for this reflected coaching is noted in Appendix H.

In terms of staff development, another implication is suggested both by the literature and the findings of the study. Following the research of Feuerstein (1980), Beyer (1987), Joyce and Showers (1988), Sternberg (1984), Wittrock (1967), Perkins and Salomon (1988), "mediating", "cuing". "teaching", "guiding", and "bridging" explicitly for transfer within the training setting will most likely facilitate complex transfer outside the training setting and inside the classroom.

As staff developers plan trainings, this explicit attention to mediating transfer is easily factored into the training design. Coupled with the peer coaching and metacognitive awareness of expectations, mediation strategies adds yet another place to the effectiveness of staff development trainings.

At the same time another implication involves promoting creative behavior, staff developers, knowing that creativity is a critical factor in promoting complex, high level transfer, plans readiness sessions, preceding in-depth cognitive training, that tapped the creative energies of the adult learners. By creating a mind set in the adult

learners that is disposed toward creative, risk-taking behavior, the adult learner approaches the training ready to "leap to transfer."

The implications noted are cognitive strategies that are effective with student learners. It seems logical to believe that similar strategies with teachers could make the effects of training more significant to classroom instruction.

Limitations of Study

Of course, the conclusions noted can be construed as mere suppositions at this point in time, since the study is limited in scope to five individual cases, which makes generalization risky. However, completion of the transfer model that tracks simple transfer and complex transfer along the continuum of behaviors: overlooked, duplicated, replicated, integrated, mapped and innovated is supported by multiple training experiences of the trainer/researcher over a period of six years.

In addition, the findings were verifiable and therefore seem significant in light of the scant information available on transfer and the intense interest by educators in the concept of transfer of learning.

A further limitation of the study is the lack of pre-study data in terms of observation of the subjects in the classroom prior to the training. Information on former teacher behavior would have provided further opportunity for comparison and measurement of new learnings and the apparent transfer levels. Although data of this sort was obtained through secondary sources, by informal conferences with supervisors, active classroom observations prior to the training study is preferred

by the researcher had circumstances permitted. A modification to the nomination process is to pre-select candidates prior to the training. This seems like a feasible alternative.

Questions for Further Study

To bring the study full circle, the idea that initially propelled this work recurs here as the project approaches it's final phase. Spearman's (1931) definition which relates creativity and transfer, "the power of the human mind to create new content by transferring relations and thereby generating new correlates" seems somewhat prophetic. Not only did this definition of creativity contain the seeds of the idea for this present study, but it also carries the seed for future studies. Questions that suggest the need for subsequent investigation, in order to "generate new correlates" about transfer and creativity are:

1. Do sessions promoting creativity, preceding a cognitive training, increase the likelihood of creative transfer in adult learners?
2. Do explicit expressions of expectations of creative transfer increase the likelihood of complex transfer in adult learners?
3. Do bridging strategies foster creative transfer in the adult learner?
4. Is the trainer, the content or the learner the critical factor in complex transfer or do all three factors weigh equally in the situational likelihood of complex transfer?

As these questions are approached, the mysteries of creativity and transfer will be further unveiled.

What This Means To Me

One hopes, after completing a comprehensive study that the findings will be not only informative, but also useful. As a result of this research project, a transfer model is being implemented in the current teacher training program conducted by the researcher.

Based on the concept that explicit attention to transfer within the training will indeed advance the learner along the transfer continuum, several strategies are being explored. After a skill or strategy has been modelled in the sessions, participants are led through a series of "bridging" strategies.

First, the participants are asked to identify an "opportunity passed" in which they might have used the new learning. For example, the teachers are cued to complete the statement, "I wish I'd known about this when ..."

Following this exploration of a missed opportunity, the teachers are asked to complete an analogy about the new skill or strategy: "Cooperative groups are like _____ because both _____." In forming the analogy, teachers begin to identify the critical attributes of the skill or strategy. This exercise helps teachers grasp the generic piece that will transfer by leading them to generalize.

Application plans for a future lesson is then required. Teachers are asked to identify a proposed lesson in which they might utilize the newly learned skill or strategy. Great care is taken to help each

teacher find a relevant application to practice within the next few days.

Between training sessions, teachers commit to try the new learnings and to informally evaluate the procedure by articulating how the skill or strategy worked with the students and it's appropriateness.

The final step in the series of procedures for the explicit transfer model is a self-reporting or peer dialogue about the level of transfer a participant is experiencing. See Appendix H. This metacognitive processing helps anchor the learning through reflective thinking and dialogue. The participant's or peer coach's awareness of the level of transfer provides the basis for self-coaching or peer-coaching toward more complex transfer.

Coupled with the expectation of creative transfer, these explicit strategies seem to help orchestrate the actual transfer into relevant classroom applications. In sum, the study has moved the trainer/researcher along the transfer continuum and in so doing, has helped define a bridge between training and transfer as a bridge of creativity awareness and risk-taking.

Finally, and perhaps, most importantly, the serendipitous learning about oneself in an undertaking such as this has by far outweighed all other learnings.

REFERENCES

Abelson, P. (1967). Relation of group activity to creativity in science. In J. Kagan (Ed.), Creativity and learning. Boston, MA: Houghton Mifflin Company.

Allport, G. W. (1985). Becoming: Basic considerations for a psychology of personality. New Haven, CT: Yale University Press.

Anderson, H. H. (Ed.) (1959). Creativity and its cultivation. New York: Harper and Row, Inc.

Andrews, E. G. (1962). Creativity and the scientist. (Doctoral dissertation, University of Michigan). Ann Arbor, MI: University Microfilms No. 63-306.

Arnheim, R. (1947). Perceptual abstraction and art. Psychological Review, 54, 66-82.

Barell, J. (1980). Playgrounds of our minds. New York: Teachers College Press.

Barron, F. (1958). The psychology of imagination. Scientific American, 199, 150-166.

Barron, F. (1972). Artist in the making. New York: Seminar Press.

Becker, H. S. & Geer. B. (1957). Participant observation and interviewing: A comparison. Human Organization, 16.

Bellanca, J. & Fogarty, R. (1986). Patterns for thinking. Palatine, IL: Illinois Renewal Institute.

Beyer, B. (1987). Practical strategies for the teaching of thinking. Boston, MA: Allyn and Bacon, Inc.

Biondi. A. M. (1972). The creative process. Buffalo, NY: D.O.K. Publishers, Inc.

Bogdan, R. C. & Biklen, S. K. (1982). Qualitative research for education: An introduction to theory and methods. Boston, MA: Allyn and Bacon, Inc.

Bogdan, R. C. & Taylor, A. (1975). Introduction to qualitative research methods. New York: John Wiley.

Brandt, R. (1988, April). On teaching thinking: A Conversation with Arthur Costa. Educational Leadership, 45(7), 11.

Cattell, J. (1983). A statistical study of eminent men." Popular Science Monthly, 62, 359-377.

Chance, P. (1966). Thinking in the classroom. New York: Teachers College Press.

Costa. A. & Garmston, R. (1985, March) The art of cognitive coaching: Supervision for intelligent teaching. Paper presented at the Annual Conference of the Association for Supervision and Curriculum Development, Chicago, IL.

Daniels, R., Health, R. & Ennis, K. (1985). Fostering creative behavior among university women. Roper Review, 7, 3.

Davis, G. A. (1981). Creativity is forever. Cross Plains, NY: Badger Press.

de Bono, E. (1973). Lateral thinking: Creativity step by step. New York: Harper & Row Publisher.

Denzin, N. K. (1978). The research art. New York: McGraw Hill.

Dillon, R. & Sternberg, R. J. (1986). Cognition and instruction. New York: Academic Press, Inc.

Dow, A. (1959). The architect's view on creativity. In H. H. Anderson, (Ed.), Creativity and its cultivation. New York: Harper and Row Publishers.

Drews, E. M. (1972). Learning together. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Duncler, K. A. (1926). A qualitative study of productive thinking. Pedogogical Seminary and Journal of Genetic Psychology, 33, 642-708.

Eisner, E. (1979). Educational imagination. New York: Macmillan Publishing Co., Inc.

Eisner, E. (1985). Educational imagination (2nd ed.). New York: Macmillan Publishing Co., Inc.

Feuerstein, R. (1980). Instrumental enrichment. Baltimore, MD: University Park Press.

Freud, S. (1924). The relations of the poet to day-dreaming. Collected papers, II. London: Hogarth.

Fromm, E. (1959). The creative attitude. In H. H. Anderson (Ed.), Creativity and its cultivation. New York: Harper and Row Publishers.

Fullan, M. (1982). The meaning of educational change. New York: Columbia Teachers College Press.

Gardner, H. (1983). Frames of mind. New York: Basic Books.

Geertz, C. (1983). The interpretation of cultures. New York: Basic Books.

Gerad, R. W. (1946). The biological basis of imagination. Scientific Monthly, 62, 477-479.

Getzels, J. (1975). Creativity: Prospects and issues. In C. Taylor & J. Getzels (Eds.), Perspectives in creativity. Chicago, IL: Aldine Publishing Co.

Glaser, B. G. (1965). The constant comparative method of qualitative analysis. Social Problems, 12, 436-445.

Gorovitz, E. (1982). The creative brain II: A revisit with Ned Herrmann. Training and Development Journal, 36(12), 72-74, 80-86, 88.

Gough, H. (1962). Imagination - undeveloped resource. In S. Parnes & H. Harding (Eds.), A source book for creative thinking. New York: Charles Scribner's Sons.

Gryskiewicz, S., Shields, J. & Drath, W. (1983). Selected readings in creativity - vol. II. Greensboro, NC: Center for Creative Leadership.

Guilford, J. P. (1975). Creativity: A quarter century of progress. In I. Taylor and Getzels (Eds.), Perspective in creativity. Chicago, IL: Aldine Publishing Co.

Hahn, R. O. (1973). Creative teachers: Who wants them? New York: John Wiley and Sons.

Hebert, E. A. & Miller, S. I. (1985). Role conflict and the special education supervisor: A qualitative analysis. The Journal of Special Education, 19(2).

Hord, S. & Loucks, S. (1979). A concerns-based model for delivery of inservice. Austin, TX: The University of Texas at Austin, CBFM Project - Research and Development Center for Teacher Education.

Hunter, M. (1973). Teach for transfer. El Segundo, CA: Tip Publications.

Jackson, P. & Messick, P. (1967). The person, the product and the response: Conceptual problems in the assessment of creativity. In J. Kagan (Ed.), Creativity and learning. Boston, MA: Houghton Mifflin Company

Johnson, D. (1988). Cooperative learning leader training. Palatine, IL: Illinois Renewal Institute, Inc.

Joyce, B. (1986). Improving America's schools. New York: Longman, Inc.

Joyce, B., Hersh, R., McKibbon, M. (1983). Structure of school improvement. New York: Longman, Inc.

Joyce, B. & Showers, B. (1980, February). Improving inservice training: The message of research. Educational Leadership, 43(8), 380.

Joyce, B. & Showers, B. (1983). Power in staff development through research on training. Alexandria, VA: ASCD.

Joyce, B. & Showers, B. (1988). Student achievement through staff development. New York: Longman,Inc.

Jung, C. G. (1946). Psychological types. New York: Harcourt Brace.

Kagan, J. (Ed.). (1967). Creativity and learning. Boston, MA: Beacon Press.

Kaplan, A. (1984). The conduct of inquiry. Scranton, PA: Chandler.

Koestler, A. (1971). The art of creation. New York: Viking.

Koftka, K. (1964). Principles of Gestalt psychology. New York: Macmillan.

Kogan, Z. (1962). Methods of furthering new ideas. In S. Parnes and H. Harding (Eds.), A source book for creative thinking. New York: Charles Scribner's Sons.

Kris, E. (1982). Psychoanalytic exploration in art. New York: International Universities Press.

Lewin, K. (1935). A dynamic theory of personality: Selected papers. New York: McGraw-Hill.

Lincoln, J. (1962). Developing a creativiness in people. In S. Parnes & H. Harding (Eds.), A source book for creative thinking. New York: Charles Scribner's Sons.

Lofland, John. (1974). Styles of reporting qualitative field research. The American Sociologist, 9, 101-111.

Lowenfeld, V. (1962). Creativity: Education's stepchild. In S. Parnes & H. Harding (Eds.), A source book for creative thinking. New York: Charles Scribner's Sons.

MacKinnon, D. H. (1967). The study of creative persons: A method and some results. In J. Kagan (Ed.), Creativity and learning. Boston, MA: Houghton Mifflin Company, 1967.

Marzano, R. J. & Arrendono, D. E. (1986). Restructuring schools through the teaching of thinking skills. Educational Leadership, 43(8), 23.

Maslow, A. H. (1959). Creativity in self-actualizing people. In H. H. Anderson (Ed.), Creativity and its cultivation. New York: Harper and Row Publishers.

May, R. (1959). The nature of creativity. In H. H. Anderson (Ed.), Creativity and its cultivation. New York: Harper and Row Publishers.

Miles, M. B. & Huberman, A. M. (1984). Qualitative data analysis: A soucebook of new methods. Beverly Hills, CA: Sage.

Miller, S. I. (1983). The logic of triangulation. International Journal of Experimental Research in Education, 22, 200-212.

Miller, S. I. & Evko, B. (1985). An enthnographic study of the influence of a mobile home community on suburban high school students. Human Relations, 38(7), 683-705.

Osborn, A. (1953). Applied imagination. New York: Charles Scribner's Sons.

Osborn, A. (1962). Development in creative education. In S. Parnes & H. Harding (Eds.), A source book for creative thinking. New York: Charles Scribner's Sons.

Overholt, G. E. & Stallings, W. E. (1976). Ethnographic and experimental hypotheses in educational research. Educational Researcher, 5, 12-14.

Parnes, S. (1962). Can creativity be increased? In S. Parnes & H. Harding (Eds.), A source book for creative thinking. New York: Charles Scribner's Sons.

Parnes, S. (1972). Creativity: Unlocking human potential. Buffalo, NY: D.O.K. Publishers, Inc.

Parnes, S. (1975). Aha! insights into creative behavior (pp. 10-11). Buffalo: D.O.K. Publishers, Inc.

Parnes, S. & Harding, H. (1962). A source book for creative thinking. New York: Charles Scribner's Sons.

Patton, M. Q. (1980). Qualitative evaluation methods. Beverly Hills, CA: Sage Publications, Ltd.

Patrick, C. (1955). What is creative thinking? New York: Philosophical Library.

Pelto, P. J. (1970). Anthropological research: The structure of inquiry. New York: Harper & Row.

Perkins, D. N. (1981). The mind's best work. Cambridge, MA: Harvard University Press.

Perkins, D. N. (1986). Knowledge as design. Hillsdale, NJ: Lawrence Erlbaum Associates, Publisher.

Perkins, D. N. (1988). Thinking frames. Paper presented at ASCD conference on Approaches to Teaching Thinking, Alexandria, VA, pp. 14-15.

Perkins, D. N. & Salomon, G. (1988). Teaching for transfer. Educational Leadership, 46(1), 22-32.

Poincare, H. (1913). Mathematical creation. The foundation of science. New York: Science Press.

Posner, M. I. & Keele, S. W. (1973). Skill learning. In R. M. W. Travers (Ed.), Second handbook of research on teaching (pp. 805-831). Chicago, IL: Rand McNally College Publishing Co.

Ribot, T. (1900). The nature of creative imagination. International Quarterly,(1), 648-675, and (2), 1-25.

Roe, A. (1963). The making of a scientist. New York: Dodd, Mead.

Rogers C. (1959). Toward a theory of creativity. In H. H. Anderson (Ed.), Creativity and its cultivation. New York: Harper and Row Publishers.

Sanders, D. & Sanders, J. (1984). Teaching creativity through metaphor: An integrated brain approach. New York: Longman, Inc..

Sergiovanni, T. (1987). Will we ever have a true profession? Educational Leadership, 44(8), 44-49.

Siegl, E. (1986). How to encourage creativity. Roper Review, 9, 1, 18-19.

Sinnot, E. (1959). The creativeness of life. In H. H. Anderson (Ed.), Creativity and its cultivation. New York: Harper and Row Publishers.

Stein, M. (1975). Creativity as an intra-and inter-personal process. In S. Parnes & H. Harding (Eds.), A source book for creative behavior. Buffalo, NY: D.O.K. Publishers, Inc.

Sternberg, R. J. (1983). Components of human intelligence. Cognition, 15, 1-48.

Sternberg, R. J. (1983). Toward a triarchic theory of human intelligence. Behavioral and Brain Science, 7, 269-315.

Sternberg, R. J. (1984). How can we teach intelligence? Educational Leadership, 42(1), 38-48.

Sternberg, R. J. (1986). Intelligence applied: Understanding and increasing your intellectual skills. New York: Harcourt Brace Jovanovich Publishers.

Stoddard, G. (1959). Creativity in education. In H. H. Anderson (Ed.), Creativity and its cultivation. New York: Harper and Row Publishers.

Taylor, I. (Ed.), (1964). Creativity progress and potential. New York: McGraw-Hill.

Taylor, I. (1962). A tentative description of the creative individual. In S. Parnes & H. Harding (Eds.), A source book for creative thinking. New York: Charles Scribner's Sons.

Taylor, I. (1975). A retrospective view of creativity investigation. In I. Taylor & J. Getzels (Eds.), Perspectives in creativity. Chicago, IL: Aldine Publishing Co.

Taylor, I. (1975). An emerging view of creative actions. In I. Taylor & J. Getzels (Eds.), Perspectives in creativity. Chicago, IL: Aldine Publishing Co.

Thurston, L. L. (1962). Developing creative thinking through school experiences. In S. Parnes & H. Harding (Eds.), A source book for creative thinking. New York: Charles Scribner's Sons.

Thurston, L. L. (1962). The scientific study of inventive talent." In S. Parnes & H. Harding (Eds.), A source book for creative thinking. New York: Charles Scribner's Sons.

Torrance, E. P. (1962). Guiding creative talent. Englewood Cliffs, NJ: Prentice-Hall.

Torrance, E. P. (1962). Developing creative thinking through school experiences. In S. Parnes & H. Harding (Eds.), A source book for creative thinking. New York: Charles Scribner's Sons.

Torrance, E. P. (1967). Scientific news of creativity and factors affecting its growth. In J. Kagan (Ed.), Creativity and learning. Boston, MA: Houghton Mifflin Company, 1967.

Torrance, E. P. (1975). Creative research in education: Still alive. In I. Taylor & J. Getzels (Eds.), Perspectives in creativity. Chicago, IL: Aldine Publishing Company.

Tyler, R. W. (1986, December - 1987, January). The five most significant curriculum events in the twentieth century. Educational Leadership, 44(4), 36-37.

Von Oech, R. (1986). A kick in the seat of the pants. New York: Harper and Row Publishers.

Von Oech, R. (1986). A whack on the side of the head. New York: Harper and Row Publishers.

Wallas, G. (1945). The art of thought. In M. Wertheimar (Ed.), Productive thinking. New York: Harper and Row Publishers.

Weisner, J. (1967). Education for creativity in the sciences. In J. Kagan (Ed.), Creativity and learning. Boston, MA: Houghton Mifflin Company.

Wittrock, M. C. (1967). Replacement and nonreplacement strategies in children's problem solving. Journal of Educational Psychology, 58(2), 69-74.

Wolcott, H. (1975). Criteria for an ethnographic approach to research in schools. Human Organization, 34(2).

Youtz, R. (1962). Psychological foundations of applied imagination. In S. Parnes & H. Harding (Eds.), A source book for creative thinking. New York: Charles Scribner's Sons.

APPENDIX A

Formats and Protocols for Observation

Observation Scheduling Sheet

	High School	Date: March 23, 1988, A.M. S_3
7:45	First Period	Coffee and Briefing
8:40	Second Period	Girl's Chorus - voice testing
9:35	Third Period	Coffee - Talk - Phone Calls
10:30	Fourth Period	Individual / Madrigals
11:30	Fifth Period	Choir/Testing (8 parts)/extra credit
12:30	Sixth Period	
1:25	Seventh Period	
2:20	Eighth Period	

Observation Sheet

(Observing For Thinking)

CLIMATE	EXPLICIT SKILL INSTRUCTION
STRUCTURED INTERACTION	METACOGNITIVE PROCESSING

APPENDIX B

Brief Description of Patterns for Thinking

What is PATTERNS?

PATTERNS FOR THINKING is an innovative and comprehensive thinking skills training program designed to help teachers incorporate **CREATIVE** and **CRITICAL** thinking into everyday lessons in all subject areas. Three years in preparation, this K-12 curriculum synthesizes the best research-based practices which promote thinking by **all** children in the classroom. By integrating thinking skills instruction into the curriculum through effective staff development, **PATTERNS** avoids the add-on, one shot and quick fix syndrome.

This training program develops patterns for thinking in craetive synthesis and critical analysis; it provides the framework for productive problem-solving, decision-making and generative ideation by all students. Instruction is explicit, with modeling, practice, feedback and transfer integrated within the training design.

In addition, specially prepared resource books and video tapes provide a wealth of support material. Included are explicit skill lessons on prediction, inferences, making and solving analogies, comparing and contracting, classifying, sequencing, drawing conclusions, and generating ideas as well as suggested subject area applications ranging from primary to high school levels.

DAY 1
THINKING AND SOME TEACHABLE MOMENTS
WITH EXPLICIT THINKING SKILLS

ANALYSIS OF ATTRIBUTES (p. 128 Patterns)	"TEACHABLE MOMENTS"	STRATEGIES
Use to sort, group, classify, compare and contrast, sequence, prioritize information; put order to a lot of information.	. Geometry . Character Analysis . Study skills such as a good outline or note taking . "isms" in Social Studies	Venn p. 169 Web p. 175

PREDICTION (p. 116 Patterns)	"TEACHABLE MOMENTS"	STRATEGIES
Use to guess, anticipate or forecast what will occur next based on prior information.	. During films, videos. . As homework, viewing of a TV program . Textbook reading . Lab experiments . Reasonable answers in Math problems . What directions are for worksheet	BET p. 116-121 Agree/Disagree

APPLICATION CONTRACT:

DATE: _____

ASSIGNMENT #1:

. Identify your peer partner.
. Plan a lesson with your peer partner.
. Try five ideas from the training in your classroom. See Day 1 Training Sheet.
. Meet once with your PACT (Peer Assisted Coaching Team).
. Bring one artifact to the next session to share.
. Track your thinking lessons in your log (back of Patterns book).

NEXT SESSION: DATE: _____

SIGNATURE: Peer Partner: _____

PACT: _____ _____ _____

_____ _____ _____

DAY 1 TRAINING
Model Behaviors To Try

Setting Climate
To Teach Thinking

3-Story Intellect Questions
- *Input - getting information
- *Process - connecting new
- *Output - using synthesis
- *Teacher Questions
- *Textbook Questions
- *Student Questions

Response Strategies
- *Wait-Time Pause
- *Multiple Answers
- *Teacher Mobility
- *Wrap-Around Forced Response
- *Physical Response (hands)
- *Student repeats directions
- *Student to student piggybacking

DOVE Guidelines

Teaching Skills
of Thinking

Analysis of Attributes (TRAITS)
- *various content or topics

Brainstorming (THINK)
- *class
- *small groups
- *partners
- *individual

Prediction (BET)
- *reading/content reading
- *math, science, S.S.
- *field trip, assembly
- *film, video, T.V.

Structuring Interaction
With thinking

Student with student:
People Search
- *Focus
- *Sponge
- *Review

Cooperative Groups
- *Forming
- *Assigning Roles
- *Time, Task, Materials
- *Response in turn
- *Processing

Student with information
Attribute Webbing
Agree/Disagree

Metacognitive Processing
About Thinking

- *P.N.I.
- *That's A Good Idea
- *Mrs. Potter's Questions
- *The Thinking Log

Peer Partner: Planning

DAY 2
THINKING AND SOME TEACHABLE MOMENTS
WITH EXPLICIT THINKING SKILLS

BRAINSTORMING (p. 113 Patterns)	"TEACHABLE MOMENTS"	STRATEGIES
Use to generate new ideas, recall information for review or to combine and associate ideas.	. Introducing a unit or concept. . reviewing for a quiz or test. . Summarizing or synthesizing information. . Planning a project.	Webbing p. 175 Clustering, p. 170 Story Grid, p. 217 Thought Tree p. 168

CLASSIFYING (p. 132 Patterns)	"TEACHABLE MOMENTS"	STRATEGIES
Use to group, order, sort, categorize; to put order to objects and ideas. information.	. grouping vocabulary words . science concepts . whenever one has lots of data . regions of country or nations . populations, etc.	Venn p. 169 Web p. 175

APPLICATION CONTRACT:

DATE:_____

ASSIGNMENT #2:

. Plan a lesson with your peer partner.
. Observe your Peer Partner teaching a thinking skill lesson, and conference using Mrs. Potter's Questions.
. Be observed by your partner and conference with Mrs. Potter's Questions.
. Meet once with your PACT.
. Bring one artifact to the next session to share.
. Track your thinking lessons in your log.

NEXT SESSION: DATE:_____

SIGNATURE: Peer Partner:_____

DAY 2 TRAINING
More Model Behaviors To Try

Setting Climate To Teach For Thinking

Active Listening

*Share/Pair
*2-4-8 Focus Interview

*show & tell
*reports
*sharing experiences

*Pacts Skills

Teaching Skills of Thinking

Prioritizing

*seatwork
*concepts
*homework

Brainstorming

*Piggybacking techniques

Structuring Interaction With Thinking

Student with student

*Human graph

Student with information

*Venn Diagram
*Story grid

*soap opera
*math problems
*parts of speech
*S. S. words

*Clustering

Metacognitive Processing About Thinking

*What? So What? Now What?
*More about The Thinking Log
*PME

*Planning
*Monitoring
*Evaluating

Peer Coaching
*plan
*observing
*conferencing

DAY 3
THINKING AND SOME TEACHABLE MOMENTS
WITH EXPLICIT THINKING SKILLS

PRIORITIZING (p. 135 Patterns)	"TEACHABLE MOMENTS"	STRATEGIES
Use to place objects or ideas in order by value.	. Homework order . Subject difficulty . Events in a story or historical piece . college choices . preferred musical pieces . information given in math problems . sequencing computer programs	Ranking p. 171 Human Graph p. 125

VISUALIZING (p. 124 Patterns)	"TEACHABLE MOMENTS"	STRATEGIES
Use to "see in mind's eye a picture put order to objects and ideas. information.	. In goal setting . In imaging a scene in literature or history . In problem-solving . In anticipating an interview or encounter	Analogy p. 178 Sketching Mapping (Graphically representing an idea)

APPLICATION CONTRACT:

DATE:_____

ASSIGNMENT #3:

. Plan and teach at least one thinking skill lesson each week.
. Plan, monitor, assess a lesson with your peer partner.
. Keep a log of the thinking skills inherent in your curriculum for future application.
. Meet with your PACT every two weeks.
. Bring an artifact to share.

NEXT SESSION: DATE:_____

SIGNATURE: Peer Partner:_____

DAY 3 TRAINING
Still More Modeled Behaviors To Try

Setting Climate To
Teach For Thinking

Teaching Skills
of Thinking

Classification

*guided (concrete)
*random

Visualization

*reading
*memory
*nineumonics
*goal setting

Structuring Interaction
With Thinking

Student with student

*Paired-Partners - Think-Aloud

Student with Information

*Venn Diagram
*Thought Tree
*Hex

Metacognitive Processing
About Thinking

Think Aloud Strategy
Practice Observation -
videotape
Training To Transfer
Strategies

*assessment
*observation (require)
*videotape

Cluster

DAYS 4 & 5

APPLICATION CONTRACT

DATE:_____

ASSIGNMENT #4

. Plan, observe, conference.
. Meet with PACT.

NEXT SESSION: DATE:_____

SIGNATURE: Peer Partner:_____

ASSIGNMENT #5

. Plan, observe, conference.
. Meet with PACT.

SIGNATURE: Peer Partner:_____

OPTIONAL IDEAS FOR FURTHER SHARING

. Audio-tape a thinking skill lesson.

. Video-tape a thinking skill lesson.

. Share a new idea with an interested colleague who has not been involved in the Patterns Training.

APPENDIX C

Schedule of Observation Visitation

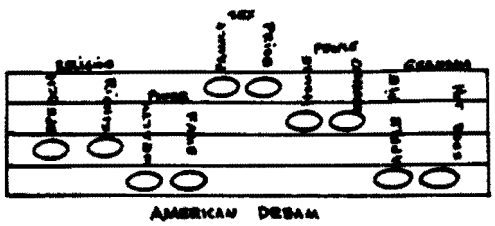
September 16, 1987	Training:	Day 1
October 14, 1987	Training:	Day 2
November 4, 1987	Training:	Day 3
November 23, 1987	Instructional Advisory Council - Meeting	
December 10, 1987	Dissertation Observation:	3 teachers
January 7, 1988	Dissertation Observation:	4 teachers
January 22, 1988	District Institute Day:	Keynote Speaker
February 10, 1988	Dissertation Observation:	3 teachers
February 17, 1988	Follow-Up Training:	(1/2 group)
March 16, 1988	Follow-Up Training:	(1/2 group)
March 23, 1988	Dissertation Observation:	1 teacher
March 24, 1988	Dissertation Observation:	2 teachers
March 25, 1988	Dissertation Observation:	1 teacher
April 4, 1988	Dissertation Observation:	1 teacher
April 5, 1988	Dissertation Observation:	1 teacher
April 8, 1988	Dissertation Observation:	1 teacher
April 11, 1988	Dissertation Observation:	1 teacher

APPENDIX D

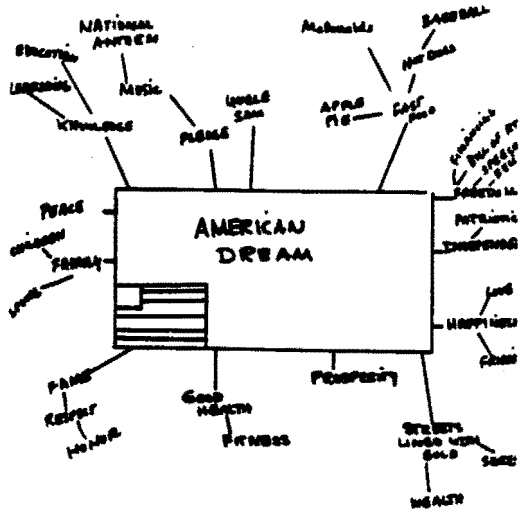
Artifact

Student Webbings

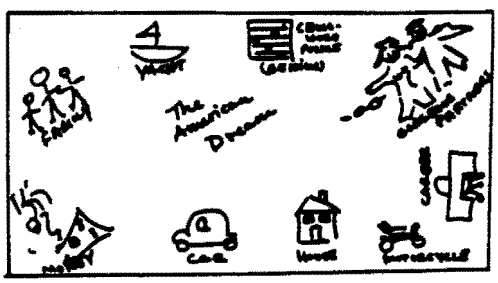
Student Webbing #1



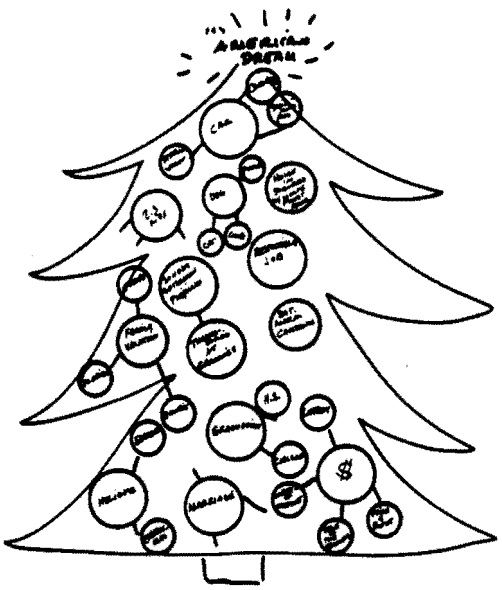
Student Webbing #2



Student Webbing #3



Student Webbing #4



Artifact

People Search
(Grade 12)

Find somone who:

1. Ranks these goals the same as you do:

☐ Stability ☐ Growth ☐ Freedom of choice

2. Can state the economic problem and identify the 3 key words.

3. Can give an example of opportunity cost from experience in dollar terms.

4. Ranks these goals the same as you do.

☐ Full employment ☐ Equity/justice ☐ Efficiency

5. Can name a resource he/she owns.

6. Can draw a PP Curve, label the axis, and explain what the curve means.

7. Can show you an example of a capital good in this room and explain why it is one.

8. Can give an example of opportunity cost from experience in terms of time.

9. Can defend or criticize an example of economic choice made by society as a whole.

Artifact

People Search

(You must get answers from every student they must initial the question they answer)

1. Knows how many credits you need to graduate.

2. Knows what privilege seniors get second semester regarding final exams.

3. Knows what Year it will be when you graduate.

4. Knows someone who has graduated from this high school.

5. Knows a senior boy and a senior girl.

6. Knows what a senior is able to do that you are not allowed to do.

7. Knows what could be scary about being a senior.

8. Knows what seniors have accomplished that you have not.

9. Knows 2 things that would be nice about being a senior.

10. Knows someone who attended this high school but who did not graduate.

APPENDIX E

Participant Interview

1. Describe your childhood and K-12 educational experience.

2. Discuss your undergraduate and graduate educational preparation in relation to your work experience.

3. How do you perceive yourself in terms of the role of teacher? Explain your thinking.

4. Rank yourself in terms of creativity and explain your ranking.

APPENDIX F

Second Party Interview

1. How do you perceive _____ in terms of the role of teacher.

2. Rank _____ in terms of creativity and explain your ranking.

APPENDIX G

Codes

Descriptive: Elements of Thinking Classroom

1. Climate
2. Skills
3. Interaction
4. Processing
26. Personal Data
27. School Data
28. Classroom Data
29. Reference - Tests/Grades

Interpretive:

5. Overlooks Opportunity
6. Simple Transfer
7. Complex Transfer
8. Creative Behavior
9. Duplicates (Simple) } Transfer
10. Replicates (Simple) }
11. Integrates (Complex) }
12. Maps (Complex) }
13. Innovates (Complex) }
14. Persists } Creativity
15. Observes }
16. Differentiates }
17. Extrapolates }
18. Elaborates }
19. Originates }

Explanatory:

20. Invents } Transfer
21. Bridges }
22. Abstracts }
23. Hugs }
24. Practices }
25. Misses }
30. Uses familiar } Creativity
31. Observes }
32. Extracts relevant }
33. Integrates essence }
34. Enhances }
35. Invents }

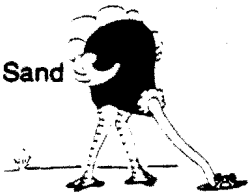
APPENDIX H

Patterns For Thinking (and Reflecting)

In my classroom I am ... Date:_____	*Ollie*  Overlooking Opportunities	*Dan*  Duplicating Through Practice	*Laura*  Replicating By Tailoring To My Kids And Content	*Jonathan*  Integrating Through Awareness And Understanding	*Sally*  Mapping Strategically Into Many Areas	*Sam*  Innovating By Diverging With Original Ideas
Setting Climate For Thinking With...						
1. 3-Story Intellect						
2. Wait-Time						
3. Multiple Answers						
4. Mobility						
Teaching Skills of Thinking:						
5. Analyzing of Attributes						
6. Classifying						
7. Prioritizing						
8. Brainstorming						
9. Predicting						
Structuring Interaction With Thinking:						
11. Cooperative Groups						
12. Think/Pair/Share						
13. People Search						
14. Webs/Venns/Clusters						
Processing Metacognitively About Thinking:						
15. P.N.I.						
16. That's A Good Idea						
17. Mrs. Potter's Questions						
18. Thinking Logs						
In General:						
19. I seem to be:						
20. I want to be:						

FROM TRAINING TO TRANSFER: LEARNER SITUATIONAL DISPOSITIONS

Ollie the Head-in-the Sand Ostrich



Do-nothing; unaware of relevance and misses appropriate applications; overlooks.

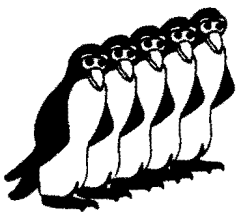
"Great sessions but this won't work with my kids or content."

Dan the Drilling Woodpecker

Drills and practices **exactly** as presented; Drill! Drill!, then stops; unsure; duplicates.

"Could I have a copy of that transparency?"

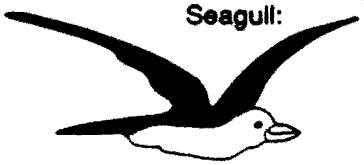
Laura the Look-Alike Penquin:



Applies in **similar** content; all look alike does not transfer into other situations, replicates.

"I use the web for every character analysis."

Jonathan Livingston Seagull:



Raised consiousness; acute awareness; deliberate refinement; integrates subtly; associates.

"I haven't used any of your ideas, but I'm wording my questions carefully. I've always done this, but I'm doing more of it."

Cathy the Carrier Pigeon:

Consciously transfers ideas to various situations, contents; carries strategy as part of available repertoire; maps

"I use the webbing strategy in everything."

Samantha the Soaring Eagle:

Innovates; flies with an idea; takes it into action **beyond** the initial conception; creates enhances, invents; risks; diverges.

"You have changed my teaching forever. I can never go back to what I used to do. I know too much. I'm too excited."

HISTORICAL REVIEW OF TRANSFER

1926	THORNDIKE	identical elements
1967	WITTROCK	near/remote
1973	HUNTER	similarity, association, degree of original learning, critical attributes
1975	PARNES	probing for connections
1979	KERMAN	coaching for transfer (TESA)
1980	FEUERSTEIN	mediating
1982	FULLAN	deep understanding
1982	RIPPLE and DRINKWATER	learn to learn strategies
1982	JOYCE, HERSH, and MACKIBBON	growth states of transfer
1983	JOYCE and SHOWERS	horizontal/vertical; coaching
1984	STERNBERG	spontaneous/guided
1985	COSTA	metacognitive
1986	MARZANO and ARRENDANDO	shift in belief first
1987	BEYER	"cues" what, when, how
1986	PERKINS	portable concepts and skills
1988	PERKINS and SALOMON	low road/high road, hugging/ bridging (provocation)
1989	FOGARTY	simple/complex, creativity/ transfer continuum

APPROVAL SHEET

The dissertation submitted by Robin Fogarty has been read and approved by the following committee:

Dr. Barney Berlin, Director
Associate Professor of Curriculum and
Human Resource Development, Loyola

Dr. Arthur Costa
Professor of Education
California State University, Sacramento

Dr. Steven Miller
Professor of Educational Leadership
and Policy Studies, Loyola

Dr. Diane P. Schiller
Associate Professor and Chairperson of Curriculum
and Human Resource Development, Loyola

The final copies have been examined by the director of the dissertation and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the dissertation is now given final approval by the Committee with reference to content and form.

The dissertation is therefore accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

April 17, 1989
Date

Director's Signature