

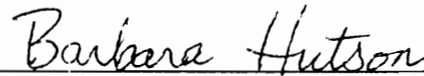
REPORTED PREACTIVE PLANNING PROCESSES OF EXPERT AND NON-EXPERT  
TEACHER TRAINERS: AN INFORMATION PROCESSING PERSPECTIVE

by

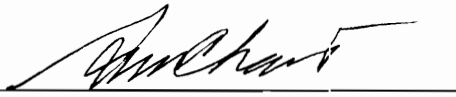
Denise E. McKeon

Dissertation submitted to the Faculty of the  
Virginia Polytechnic Institute and State University  
in partial fulfillment of the requirements for the degree of  
DOCTOR OF EDUCATION  
in  
Curriculum and Instruction

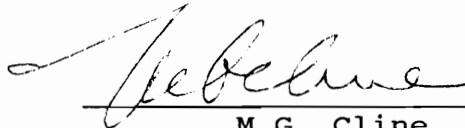
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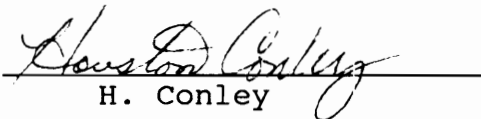
Barbara A. Hutson, Chairperson



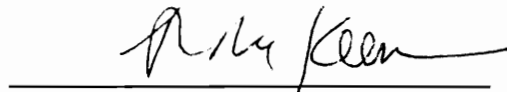
A.U. Chamot



M.G. Cline



H. Conley



R. McKeen

April, 1993

Blacksburg, Virginia

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TEACHER TRAINERS: AN INFORMATION PROCESSING PERSPECTIVE

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Committee Chairperson: Barbara A. Hutson  
Curriculum and Instruction

(ABSTRACT)

Participation in inservice training is one way in which teachers and other educational professionals learn and update the skills that they bring to the instructional process. Unfortunately, little descriptive or empirical research has been conducted that specifically examines the training professional who provides the training. This study had three main goals: to provide a window on the strategies that trainers use when they plan for workshop delivery; to examine the differences between expert and non-expert teacher trainers using an information processing perspective grounded in the research on cognitive psychology, expertise, and teaching; and finally, to provide an in-depth look at how expert trainers plan for workshops.

The study had two parts. First, a workshop planning strategy questionnaire and demographic survey were administered to 78 training professionals attached to 16 federally funded regional training centers. Next, think aloud interviews were conducted with 3 trainers who had been identified as training experts by their peers.

Exploratory data analyses revealed that trainers consider training expertise to be a function of three dimensions: knowledge of content, social affective skills and planning/organizational abilities. Exploratory analyses also showed that both experts and non-experts report using a wide variety of strategies when planning for workshops, although the least frequently reported strategies were rehearsal strategies (scripting and practicing what to say and do). Both experts and non-experts reported using strategies consistently in familiar and unfamiliar settings.

A Kruskal-Wallis one-way ANOVA showed that there were no significant differences between the groups of trainers in the reported use of metacognitive strategies. However, expert trainers report extensive metacognitive strategy use (particularly planning and self-monitoring strategies) during the think aloud interviews.

Two additional Kruskal-Wallis ANOVAs revealed that neither previous coursework on teaching methodology and training nor previous classroom teaching experience (except at grades 4-5) showed any significant effects with respect to trainers' categorization as experts. Experts, however, appear to be able to use their previous experiences and knowledge in a way which helps them become experts.

The study concludes with implications for training development programs and implication for preparing and developing teacher trainers.

## ACKNOWLEDGEMENTS

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## TABLE OF CONTENTS

|   |    |
|---|----|
| CHAPTER ONE . . . . .   | 1  |
| Statement of the Problem . . . . .  | 6  |
| Purpose of the Study . . . . .  | 13 |
| Research Questions . . . . .  | 14 |
| CHAPTER TWO . . . . .   | 16 |
| Introduction . . . . .  | 16 |
| Cognition . . . . .   | 18 |
| Approaches to Information Processing and<br>Problem Solving . . . . .   | 18 |
| Anderson: The Adaptive Control of Thought . . . . .   | 22 |
| The Role of Social and Affective Constructs in<br>Learning . . . . .  | 25 |
| The Nature of Expertise . . . . .   | 27 |
| Moving from Novice to Expert: An Example . . . . .  | 29 |
| Expert/Novice Behaviors in Different Domains . . . . .  | 32 |
| Application of the Literature on Cognition and<br>Expertise to Trainers' Preactive Planning<br>Strategies . . . . . | 38 |
| Review of the Training Literature . . . . .   | 42 |
| Teacher Cognition . . . . .   | 47 |
| Teachers' Implicit Theories About Teaching and<br>Learning . . . . .  | 48 |
| Teachers' Interactive Decision Making . . . . .   | 49 |
| Teacher Planning . . . . .  | 51 |
| Applicability of the Literature on Teaching<br>to Trainers . . . . .  | 55 |

|  |     |
|--|-----|
| CHAPTER THREE . . . . .  | 61  |
| Overview . . . . .   | 61  |
| Research Question and Research Hypotheses . . . . .                  | 62  |
| Background of the Study. . . . .                                     | 62  |
| Overview of The Present Study . . . . .                              | 64  |
| The Term "Expert:" Some Assumptions and<br>Some Limitations. . . . . | 65  |
| Subjects . . . . .   | 66  |
| Procedures . . . . .   | 67  |
| The Nomination Process: Some Caveats . . . . .                       | 69  |
| Instrument/Data Collection . . . . .                                 | 71  |
| Questionnaire and Demographic Survey . . . . .                       | 72  |
| Think Aloud Interviews . . . . .                                     | 74  |
| Analyses . . . . .   | 79  |
| Exploratory Data Analyses . . . . .                                  | 79  |
| Analysis of Research Question . . . . .                              | 80  |
| Analysis of Research Hypothesis One . . . . .                        | 82  |
| Analysis of Research Hypothesis Two . . . . .                        | 83  |
| Limitations of the Study . . . . .                                   | 84  |
| Conclusion . . . . .   | 85  |
| CHAPTER FOUR . . . . .   | 86  |
| Introduction . . . . .   | 86  |
| General Analysis Procedures . . . . .                                | 87  |
| Results of the Exploratory Data Analysis . . . . .                   | 87  |
| Analysis of Votes for Experts . . . . .                              | 88  |
| Trainers' Previous Teaching Experience . . . . .                     | 89  |
| Previous Training Experience . . . . .                               | 90  |
| How Trainers Say They Learned to Train. . . . .                      | 92  |
| Trainers' Reported Strategy Use. . . . .                             | 93  |
| Strategy Use in Context . . . . .                                    | 102 |

|   |         |
|---|---------|
| Other General Analysis of the Questionnaire Responses . . . . .   | 108     |
| Summary of the Findings on Trainers' Characteristics, Descriptions of Expert Trainers and Reported Strategy Use . . . . . | 111     |
| Metacognitive Strategy Use by Expert and Non-Expert Trainers . . . . .  | 112     |
| Factors Relating to Trainers' Expertise . . . . .   | 113     |
| Summary of Findings on Trainers' Use of Metacognitive Strategies and Factors Relating to Trainer Expertise . . . . .      | 117     |
| Discussion of the Findings . . . . .  | 119     |
| How Expert Trainers Plan . . . . .  | 122     |
| Think Aloud Interview Procedures . . . . .  | 123     |
| Data Analysis Procedures . . . . .  | 125     |
| Case Study 1 . . . . .  | 126     |
| Discussion of Case Study 1 . . . . .  | 132     |
| Case Study 2 . . . . .  | 133     |
| Discussion of Case Study 2 . . . . .  | 141     |
| Case Study 3 . . . . .  | 142     |
| Discussion of Case Study 3 . . . . .  | 150     |
| Summary of the Case Studies . . . . .   | 151     |
| <br>CHAPTER FIVE . . . . .  | <br>154 |
| Introduction . . . . .  | 154     |
| Summary of the Study . . . . .  | 154     |
| Findings, Conclusions and Implications . . . . .  | 156     |
| Findings From the Exploratory Data Analysis . . . . .   | 156     |
| Relationship to Research Literature. . . . .  | 156     |
| Conclusions and Implications . . . . .  | 157     |
| Need for Further Research . . . . .   | 158     |
| Research Question on Trainers' General Use of Strategies . . . . .  | 159     |
| Findings on Trainers' Preactive Planning Strategies . . . . .   | 159     |

|   |     |
|---|-----|
| Relationship to the Research Literature   | 160 |
| Conclusions and Implications . . . . .  | 167 |
| Need for Further Research . . . . .   | 168 |
| Research Hypothesis One: Use of Metacognitive Strategies . . . . .              | 170 |
| Findings on Expert Trainers' Use of Metacognitive Strategies . . . . .          | 170 |
| Relationship to the Research Literature   | 171 |
| Conclusions and Implications . . . . .  | 173 |
| Need for Further Research . . . . .   | 177 |
| Research Hypothesis Two: Variables Related to Expertise . . . . .               | 180 |
| Findings on Factors Related to Trainers' Being Categorized As Experts . . . . . | 181 |
| Relationship to Research Literature . . . . .                                   | 181 |
| Conclusions and Implications . . . . .  | 186 |
| Need for Further Research . . . . .   | 187 |
| Implications for Training Development Programs . . . . .                        | 189 |
| Implications for Preparing and Developing Teacher Trainers . . . . .            | 193 |
| Summary of Conclusions. . . . .   | 195 |
| References. . . . .   | 198 |
| Appendix A. . . . .   | 207 |
| Appendix B. . . . .   | 223 |



## LIST OF TABLES

|         |   |
|---------|---|
| Table 1 | Trainers' Reported Strategy Use by Major and Subcategories                                      |
| Table 2 | Range of Raw Scores for Experts and Non-Experts in Each Strategy Category                       |
| Table 3 | Trainers' Reported Strategies When Preparing for Unfamiliar/Familiar Workshops                  |
| Table 4 | Trainers' Reported Strategies When Preparing for Unfamiliar/Familiar Audiences                  |
| Table 5 | Kruskal-Wallis $\chi^2$ Values Between Five Groups on Teaching Experience                       |
| Table 6 | Kruskal-Wallis $\chi^2$ Values Between Five Groups on Teaching Methodology Coursework           |
| Table 7 | Kruskal-Wallis $\chi^2$ Values Between Five Groups on Training Methodology Coursework/Workshops |

## LIST OF FIGURES

- Figure 1 Comparison of Experts' and Non-Experts' Raw Scores for Reported Metacognitive Strategy Use
- Figure 2 Comparison of Experts' and Non-Experts' Raw Scores for Reported Cognitive Strategy Use
- Figure 3 Comparison of Experts' and Non-Experts' Raw Scores for Reported Social Affective Strategy Use

REPORTED PREACTIVE PLANNING PROCESSES OF EXPERT AND  
NON-EXPERT TEACHER TRAINERS: AN INFORMATION PROCESSING  
PERSPECTIVE

CHAPTER ONE

INTRODUCTION

Participation in inservice training is one way in which teachers and other educational professionals learn, update and refresh the skills that they bring to the instructional process. Although studies of inservice education point to the efficacy of various forms of staff development (Showers, Joyce & Bennett, 1987), the training workshop continues to be a mainstay of the delivery systems of most staff development programs (Arawak, 1986; Gall & Renchler, 1985; Nicholson & Joyce, 1976). Unfortunately, little quantitative or qualitative research has been conducted that examines a key ingredient in any workshop delivery system - the training professional who conducts the training (Maddocks, 1991).

What makes a good teacher trainer? What is it that good teacher trainers do that makes them good? Is it having a flashy presentation style and a beautifully produced set of overhead transparencies (Foxon, 1992)? Is it a winning sense

of humor and the ability to make training fun (Gordon, 1992)? Or is it something more elusive and more complex, a combination of cognitive skills and behaviors which allows good trainers to shape the content and context of the learning experience to the needs of those being trained?

The research in cognitive psychology yields clues which may provide insight into the nature and quality of the cognitive processes that good trainers employ. Chief among these clues is the distinction that most cognitive psychologists make between declarative and procedural knowledge, in other words, the difference between *knowing that* versus *knowing how* (Shuell, 1986).

Declarative knowledge (knowing that) is knowledge about things which is thought to be represented in memory as an interrelated network of facts; procedural knowledge (knowing how) is knowledge of how to perform various skills (Anderson, 1983, 1990; Newell & Simon, 1972). While the distinction between declarative knowledge and procedural knowledge is not absolute, most declarative knowledge can be expressed verbally, while much procedural knowledge cannot. As Anderson (1990, p.224) suggests, a good example of procedural knowledge that cannot be described is riding a bike. He states that "most of us know quite well how to ride a bike, but cannot put that knowledge into words."

The development of procedural knowledge takes place, over time, in a series of stages of skill acquisition. In successive stages, the learner creates an internal representation of the task to be performed, refines his understanding of the task, strengthens the connections between elements of the task to be performed and eventually fine-tunes and speeds up performance of the task. Anderson (1983), in fact, states that in the case of "experts," procedural, rather than declarative knowledge governs performance.

The fundamental distinction between declarative and procedural knowledge has guided much of the research conducted to date on "expertise." Evidence of the use of qualitatively different information processing strategies, such as those described by Anderson (1983) and Newell and Simon (1972), can be found throughout the research on expert performance (Chase & Simon, 1973; Chi, Feltovich & Glaser, 1981; Chi, Glaser & Farr, 1988; Newell & Simon, 1972). Further evidence of proceduralized knowledge emerges through examinations of "metacognitive" or higher order executive skills used by learners to control the learning task (O'Malley, et.al., 1985; O'Malley & Chamot, 1990; Palincsar & Brown, 1989).

A review of the literature on training reveals that the concept of trainer expertise has not been explored either in terms of procedural knowledge or metacognitive strategy

use. While there is little in the training literature *per se* which addresses these issues, the literature on teaching offers some clues about the nature of good teaching which might be applicable to training. Although the research dealing with expert teachers expresses the differences observed between experts and non-experts somewhat differently (Borko & Livingston, 1989; Shavelson, 1983), it nevertheless echoes the qualitative difference observed between declarative and procedural knowledge.

Can this teaching research serve as a foundation for examining training? Although training and teaching are not identical acts, training and teaching have much in common. Both interpret and act upon a stated body of knowledge to be learned. Both are complex tasks which result in the learner realizing certain behaviors and achieving certain learning goals. Teaching and training are also different in certain important respects: audience, goals, and delivery time, for example. While these differences must temper any examination of the research on teaching, the similarities found in training and teaching suggest that an examination of the research on teaching would ultimately inform research which would be conducted on training.

The research on teaching suggests that understanding the cognitive or information processing skills of teachers is the

key to understanding the nature and development of good teaching (Showers, Joyce & Bennett, 1987). Indeed, many educational researchers have contended that the most important teaching skills are problem solving and decision making (Shavelson, 1973; Shulman & Elstein, 1975). Shulman (1986, p.23) further states that the essential task for the teacher is to "appraise, infer, or anticipate the prior cognitive structures that learners bring to the learning situation, organizing the content of their instruction in terms of those preconceptions," implying that teacher thought processes are central to the delivery of instruction.

Although this view encourages the portrayal of the teacher as a rational information processor, it is likely that this conceptualization of teaching more accurately describes only certain types of teaching behaviors. Yinger (1978) points out that the pace of the teacher's interactions with students during instructional time in the classroom often precludes the rational-purposeful kind of thinking that is normally associated with problem solving and decision making. To understand teaching (and subsequently, training) as a purposeful, reflective activity, it is necessary to look at those times when thoughtful behavior is most likely to occur: during the planning or preactive stage of teaching. During planning teachers exhibit what Yinger (1978) describes as

"empty classroom" behaviors: preparing lesson or learning plans, setting up equipment, and thinking about how to deal with certain learning problems in advance of actual instruction, or reflecting on the impact of a lesson that's just been taught. If teaching and training can be shown to be similar acts, it follows that a study of the preactive stage of training would also be critical in understanding the nature and development of good training.

Understanding the general nature of trainer expertise, particularly the role that planning expertise contributes to the concept of "expert" trainers, would provide important evidence that trainers' thought processes are central to the delivery of good training. This study therefore, will explore the notion of trainers' expertise through an examination of those elusive and complex "empty classroom" behaviors, trainers' preactive planning processes.

### Statement of the Problem

The lack of quantitative and qualitative information regarding training in general, as well as the lack of more specific information about trainers' cognitive processes, creates a void in our understanding of what expert trainers know and do that makes them experts. This void is a critical one to examine if training is to serve as a primary vehicle



for providing continuing education for large groups of practicing teachers.

An examination of several areas of research literature (cognition and expertise, training and staff development, teaching and teacher cognition) which would inform a study of trainers' cognitive processes reveals that while each of the areas of literature contributes something to our overall understanding of the problem, there are still pivotal pieces missing. Although most of these areas of research literature (such as that of training, the literature on cognition and expertise, and the literature on teaching and teacher cognition) hint at the cognitive processes of trainers and trainer expertise, explicit studies of these concepts appear to have fallen between the investigatory cracks.

Key to an exploration of the preactive planning stage of training is an examination of the types of information processing strategies used by experts. The research in cognitive psychology and the nature of expertise (Anderson, 1983, 1990; Chi, Glaser & Farr, 1988; Chi, Glaser & Rees, 1982; O'Malley & Chamot, 1990) provides us with several clues about the cognitive processes that might be used by expert trainers, although this body of work fails to address training directly.

For example, experts appear to employ higher level or "metacognitive" skills to process information or solve problems (Brown & Palincsar, 1982; Chi, Glaser & Farr, 1988; O'Malley & Chamot, 1990). While the term metacognition has come to be used very broadly and quite widely, metacognition (and metacognitive skill) as defined by Brown & Palincsar (1982), refers to the executive controls within information processing models that appear to regulate cognition. In other words, metacognition involves **planning** activities prior to undertaking a problem (predicting outcomes, scheduling strategies, and attempting vicarious forms of trial and error), **monitoring** activities during learning or problem solving (testing, revising, and re-scheduling one's strategies for learning or problem-solving), and **checking** outcomes (evaluating the outcome of any strategic actions against criteria of efficiency and effectiveness).

Additionally, studies of expertise show that experts appear to have routinized certain aspects of information processing or problem solving in situations which are familiar to them (Shavelson, 1983), and, therefore, tend to solve problems faster (Chi, Glaser & Rees, 1982).

The fact that none of the studies of expertise conducted to date has explored the nature of expertise from an information processing perspective in training professionals

is a serious problem. While the cognitive research and literature which describes the behaviors of experts and novices may hint at important distinctions that may exist in the performance of expert trainers, only a study designed to examine these processes in trainers could verify if such distinctions do, in fact, exist. Such a study would contribute to a better understanding of training, as well as a more complete picture of the nature of expertise.

A review of the literature on training in search of explanations of training expertise proves somewhat unproductive, as well. Such a review reveals that there are two types of literature deal with training: the staff development literature and the training (or human resource development) literature. The staff development literature focuses primarily on training that takes place within a school or school district context. The training literature tends to focus on contexts other than schools, i.e., business settings, industrial settings, health care settings. However, neither type of literature offers much in the way of scientific explanation on the nature of trainer expertise.

Much of the literature on staff development focuses on the effect of inservice training on the observable behavior of teachers (Berman & McLaughlin, 1975; Crandall, et. al, 1982; Hall & Hord, 1987; McKibben & Joyce, 1980; Showers, 1982;

Showers, Joyce & Bennett, 1987). The literature on training, meanwhile, primarily offers conceptual descriptions and "how-to" tips which are concerned with the development of needs assessments instruments, stand-up delivery techniques, training transfer and evaluation procedures (Broadwell, 1990; Friedman & Yarborough, 1985; Laker, 1990), although some recent studies have begun to explore the cognitive processes of trainers (Maddocks, 1991; Watkins, 1990).

The scant information on cognitive processing found in the training literature might appear to suggest that equally large gaps also exist in the literature dealing with other groups of professionals. This, however, is not the case. The critical effect that cognition appears to have on practice has been well documented in studies which examine the cognitive skills of physicians, psychologists, typists, waiters, and judges, to name just a few groups of professionals who have been studied (Chi, Glaser & Farr, 1988; Kagan, 1988). This suggests that the effect of cognition on practice is indeed pervasive, and, therefore, implies that the cognitions of trainers may have an effect on how they perform. The absence of information about the cognitive aspects of training in the training and staff development literature underscores the serious gap that exists in the study of staff development and training.

Because neither the literature on staff development nor the literature on training offers much in the way of descriptive or empirical data which examine the thought processes of trainers who prepare and deliver inservice training workshops, there are few cognitive underpinnings to support claims which describe how effective trainers function or how trainers can learn to become more skilled (Maddocks, 1991). A study which systematically examines the information processing skills of both expert and non-expert trainers would begin to build a foundation from which to construct both more accurate claims of trainer expertise and more realistic trainer improvement programs. Such a study would also provide a foundation for conducting subsequent research on training and trainer expertise.

Although the literature on staff development and training offers little information on cognition, there is a solid body of research information which comes from studies with professionals whose job, in many ways, resembles that of a trainer: the research on teachers and the cognitive aspects of expert teaching. The emphasis on teacher cognition found in the literature on teaching is a relatively recent one which initially drew from the research examining the problem-solving skills of physicians and psychologists (Kagan, 1988). This teaching research, which generally suggests that teacher

thought influences the instructional act (Clark & Peterson, 1986), has begun to suggest more specifically that practice is greatly influenced by teacher thinking (Clark & Yinger, 1980; Shavelson, 1983), that teaching is guided by teacher thoughts and plans (Clark & Peterson, 1986; Clark & Yinger, 1980; Lowyck, 1986; Zahorik, 1975), and that teaching is a higher-level decision making process (Isenberg, 1990; Shulman, 1987).

Teaching and training appear to be similar in many ways. Both involve planning. Both require that the person teaching or training utilize pedagogical content knowledge, that is, the ability to transform subject matter knowledge "into forms that are pedagogically powerful and yet adaptive to the variations in ability and background presented by the students" (Shulman, 1987, p.8). Both are complex cognitive skills. Given these similarities, the rich research conducted to date on teaching and teacher thought could serve as a potential source of information which might be used to guide a preliminary study of trainers' cognitions.

Teaching and training, however, are not identical tasks. Although teaching and training may appear to be similar in many respects, particularly with regard to the cognitive or "empty classroom" behaviors described by Shulman and Yinger, teaching and training also differ in important ways. Teachers generally work with a group (or groups) of students over a

long period of time, while trainers may only see a group of trainees once. Teachers spend large portions of time and energy on classroom management functions, while trainers generally do not need to worry about "discipline problems." Teachers in K-12 settings are generally designing instruction for children or young adults; trainers must design instruction for adults, who in many cases, may be colleagues and peers.

These differences notwithstanding, many of the findings emerging from the research on teaching appear to have resonance for trainers as well. However, the lack of crucial information on the cognitive aspects of training and cognitive processes of training professionals precludes generalizing the findings of the research on teaching to training. A study of trainers, informed by the research conducted to date on teachers, could develop a web of information which would ultimately support informed and reasonable comparisons of the ways in which the cognitive processes of teaching and training are similar or different.

#### Purpose of the Study

The purpose of this study is to examine the preactive planning processes of expert and non-expert teacher trainers from an information processing strategy perspective. The study will provide descriptive information on the information

processing strategies generally reported by trainers and will compare the relative frequency of higher order or metacognitive information processing strategies used by both experts and novices. The study will also explore the relationship of metacognitive strategy use to teacher trainers' prior experiences with teaching and training. Finally, the study will offer an in-depth look at the planning processes of three trainers who have been nominated as experts by their peers.

### Research Questions

Based on the gaps that exist in the literature with regard to training, the cognitive processes of trainers, and the nature of trainers' expertise, it appears that there are compelling reasons to undertake a study which would examine precisely these areas. This study, therefore, will be designed to answer the following research questions:

1. What information processing strategies do trainers generally report using during the preactive planning phase of training?
2. Is the proportionate use of metacognitive strategies employed by "expert" trainers significantly different during the preactive planning stage of training from that employed by other trainers?



3. Can categorization as "expert" be predicted by trainers' previous knowledge of teaching and learning (e.g., previous teaching experience, previous training experience, previous classwork in education methods)?

CHAPTER TWO  
REVIEW OF THE LITERATURE

Introduction

In an examination of trainers' cognitive processes and trainer expertise, several bodies of literature must be reviewed. The literature on cognition and information processing must be examined with special attention directed to descriptions of "expert" behaviors. The literature on training must be examined for research findings which contribute to the discussion of trainers' cognitive processes and trainers' expertise. The literature on teacher cognition, particularly that which deals with the cognitive processes involved in preactive teaching or planning must be examined for its potential applicability to training settings.

This review of the literature will be a comprehensive one which examines each of the areas listed above. Such a comprehensive review is necessary to provide the context for understanding the preactive planning processes of teacher trainers from an information processing perspective. However, because information on the cognitive processes of trainers is so scarce, and information on expert trainers non-existent, the review must necessarily draw on findings in research literature not directly related to training. By building a

theoretical "sawhorse," with one set of legs assembled from the literature on cognition and expertise, the other set of legs constructed from the literature on teaching, the review will construct a platform on which inferences about training and trainers can comfortably rest.

First, the information processing theories and principles which have fueled the research on expertise will be explored to provide an understanding of the cognitive framework that supports the research on expertise. Next, a discussion of expertise will illustrate how these information processing principles could theoretically operate in a training setting, and have been observed to operate in a wide variety of domains. Applicability of this information to trainers will be demonstrated in the third section of the review, thus completing the first set of "sawhorse" legs.

The second set of "sawhorse" legs will consist of an examination of the literature on training and the literature on teaching, especially the cognitive aspects of teacher planning. The second set of "sawhorse" legs will be finished with a discussion of the applicability of the literature on teachers to teacher trainers.

## Cognition

While the topic of cognition is a vast one, this section will provide a brief discussion of various approaches to information processing and problem solving. The discussion provides a necessary cognitive frame for subsequent exploration of the notion of expertise. The section will also provide a somewhat detailed discussion of the work of Anderson (1983, 1990), since much of this work ties directly to research which explores the development and use of problem solving/information processing strategies (O'Malley & Chamot, 1990).

### Approaches to Information Processing and Problem Solving

Cognitive psychology attempts to understand the nature of human intelligence and how people think. Although the study of human thinking was undertaken a thousand years ago, primarily by philosophers, the study of cognition as a science has only developed during the last hundred years (Anderson, 1983). The growth of cognitive psychology during the last thirty-five years has increased dramatically and focused primarily on information processing approaches concerned with examining learning as an active, constructive process, how knowledge is represented and organized in memory, the nature of higher order (or metacognitive) processes, and the role that prior

knowledge plays in learning. The information processing orientation parallels the development of both problem solving computer programs and the field of artificial intelligence, both of which seek to replicate the way the mind works.

The development of information processing approaches and their link to computer programs is largely due to the now classic work of Newell and Simon (1972), who suggested that information processing can be conceived of as a series of production systems, with productions functioning as the basic unit of cognition and problem solving. A production is defined as a condition-action sequence. If a certain condition is met, then a certain action is performed.

Problem solving, perhaps the archetype of information processing, was further described as a search through a problem space characterized by a system of ordered productions. The "operator" or "executive" moves down through a series of productions until a condition is found which matches the condition being examined. The appropriate action which matches the condition is taken, and the operator moves back to the top of the series to start the search over again.

Newell and Simon (1982) speculate that skill in problem solving, as exemplified in chess problems, rests not only on one's ability to recognize a substantial number of different

problem patterns, but also involves knowing what to do in the presence of such patterns. That is, if a chess expert knows something on the order of 50,000 productions, in which the chess pattern is the condition of the production and the appropriate response to the pattern is the action, the expert will not have to think out an appropriate move. Experts effectively "see" possibilities for any given move; they have stored the solutions to many problems which non-experts must work out as novel problems.

Hayes (1981) conceives of problem solving as consisting of two premises: that of representing the problem and searching for a solution to problem. He describes a series of six steps which more fully describe the problem representation and problem solving strategies undertaken by problem solvers as they work through the problem:

1. Finding the problem (recognizing that there is a problem to be solved)
2. Representing the problem
3. Planning a solution
4. Implementing the plan
5. Evaluating the solution
6. Consolidating gains (learning from the problem solving experience).

Hayes, like Newell and Simon, states that skill in problem solving depends on one's store of many different problem types or schemata. The more problem schemata one knows, the better prepared one is as a problem solver. Perhaps more importantly, however, he also suggests that skill in problem solving relates to knowing when certain schemata are appropriate to use, and when they are not. In doing so, Hayes alludes to the executive process that monitor and evaluate one's own learning.

Sternberg (1980, 1982, 1985), sees information processing and problem solving as a componential, hierarchically ordered process consisting of metacomponents, task performance components and knowledge acquisition components. Metacomponents are described as higher order control processes used for executive decision making in problem solving. They include such functions as deciding on the nature of the problem being confronted, deciding on a strategy for task performance, and correctly evaluating external feedback. Task performance components are concerned with encoding the terms of the problem, inferring relations between terms and comparing alternate solutions. Knowledge acquisition components are processes used for learning new and consequential information. They consist of selective encoding (distinguishing between relevant and irrelevant information),

selective combination (combining new information in such a way as to render it interpretable), and selective comparison (by which one relates new information which was just encoded to old information which was already part of one's knowledge base).

Sternberg's view of information processing and problem solving is important in that it recognizes and elaborates the existence of higher order or executive processes; its drawback is that it fails to show how the hierarchical relationships of the components emerge and/or develop.

#### Anderson: The Adaptive Control of Thought

In 1983, Anderson proposed a theory of cognitive architecture which was both extensive and explicit. Known as ACT\* (read ACT-star), this theory of higher order cognitive learning and information processing describes the basic principles of operation built into the cognitive system (Anderson, 1983). A central feature of the theory is the notion of control - what gives thought its direction, and what controls the transition from thought to thought.

Both the theory and its accompanying computer program are based on the premise that a single set of learning processes is involved in skill acquisition, from language acquisition to schema abstraction. (While use of the term schema is observed



in other contexts, such as reading research, Anderson [1990] defines a schema as a large complex unit of knowledge that organize much of what we know about general categories of objects, classes of events and types of people. This is the definition which will be applied throughout this study).

A key component of ACT\* (like many other cognitive theories) is the distinction between declarative and procedural knowledge. Declarative knowledge is thought to be a network of propositions and factual information. Procedural knowledge, on the other hand, is seen as a series of productions; the conditions under which an action should be carried out, as well as the details of an action to be taken. While concerned with the development of declarative and procedural knowledge, as well as the relationship between the two types of knowledge, the theory, unlike others, emphasizes the importance of procedural knowledge.

Although all knowledge starts out as declarative knowledge, procedural knowledge is learned by making inferences from facts available in the declarative knowledge system (Anderson, 1990). The procedural system uses declarative knowledge to guide behavior, applying that knowledge interpretively. Once the knowledge has been applied a number of times, a set of productions can be compiled which applies the knowledge directly (Anderson, 1983, 1990). In

effect, Anderson suggests, procedural knowledge is learned in a series of three stages. In the declarative stage general problem solving and analogy formation work to interpret declarative knowledge. In the knowledge compilation stage, a sequence of productions may be combined into macroproductions or become proceduralized (the process of proceduralization subsumes domain-specific knowledge into a more complex production). Finally, in the tuning stage, production systems are generalized, made more discriminatory or strengthened. Anderson claims that procedural learning (or the acquisition of productions) such as problem solving or decision making occurs only by executing a skill; one learns by doing. Procedural learning, therefore may be seen as a much more gradual process than declarative learning.

The distinctions between Anderson's declarative stage and the later knowledge compilation stage and the tuning stage of proceduralization would appear to be qualitative in nature. In effect, the way in which information is processed and acted upon in the declarative stage is distinct from the way in which it is processed and acted upon in the two succeeding stages. In the declarative stage, knowledge tends to be learned or memorized as a set of facts. In the knowledge compilation stage or tuning stage, the connections among the sets of facts tend to be strengthened. The distinctions

between the knowledge compilation stage and tuning stage appear to be much more subtle. Perhaps, as the name suggests, information processing functions are fine-tuned with regard to speed and efficiency of processing, while the nature of the information process remains essentially the same.

Anderson's work in characterizing the nature of the changes that take place in information processing permits the speculation that such qualitative changes would be more readily observable (or notable) than changes which fine-tune information processing. Studies on the nature of expertise (Chi, Glaser & Farr, 1982) suggest that these qualitatively different information processing strategies appear in the problem solving repertoires of those who are considered to be "experts." Therefore, Anderson's hypothesis about the qualitative difference that appears to exist between declarative and procedural knowledge, as well as the findings from the research on expertise, becomes central to the construction of this study.

#### The Role of Social and Affective Constructs in Learning

While Anderson's theory of cognition is currently seen to be the most explicit and comprehensive (Shuell, 1986), one area which appears to be neglected by the theory is the role that social or affective constructs appear to play in the

ability to process information or problem solve. Anderson (1990) discusses social cognition in cursory fashion, but he does so purely from the point of view that certain social "schemas" may be developed which result in stereotypes of certain groups of people, such as ethnic groups. Although the use of social and affective strategies to learn or problem solve are reported in the literature (O'Malley & Chamot, 1990; Smith & Baltes, 1990), these strategies do not appear to resemble underlying mental processes as do other types of information processing or learning strategies (O'Malley & Chamot, 1990).

Nevertheless, there is good reason to suspect that such social or affective processes may play an important role in learning and problem solving. Rothman (1991), discusses the hotly contested theory of "situated cognition," in which people are thought to solve practical problems in daily life by relying on cues, tools and other individuals in their environment. In this discussion he states that proponents of this theory believe that "knowledge resides not within someone's head, but in his almost constant interactions with the world around him," (Rothman, 1991, p. 8). Knowing when and whom to ask for help is an important social (and problem solving) skill. Using self-talk (or mental control) to reduce

anxiety about a task to be performed or problem to be solved is also an important affective strategy.

In addition to the questions raised by those who depict learning as a socially shared activity, the highly interactive nature of teaching and training may show that expert use of social or affective skills or strategies in some way contributes to the more general perception of "expert teacher" or "expert trainer." For this reason, the notion of social/affective processes and strategies is important to include in a preliminary examination of the repertoire of strategies of training experts, in addition to those which are tied exclusively to underlying mental processes.

### The Nature of Expertise

Much of the research conducted in cognitive psychology has been concerned with one major area of inquiry: the development of expertise in problem solving (Shuell, 1990). On the most general level, the study of expertise seeks to understand and account for "what distinguishes outstanding individuals in a domain from less outstanding individuals in a domain" (Ericcson & Smith, 1991, p.2). Expertise, however, may be more specifically defined as the possession of a large body of knowledge and procedural skills (Chi, Glaser & Rees, 1982). The notion of expertise has usually been examined in

the research literature by creating two general classes of performance, expert and novice.

This categorization of expert and novice is somewhat problematic, however. Operational definitions are difficult to state, although the term "novice" is generally used to connote someone who has limited experience with the field or material being studied, not someone with no experience.

In addition, the categories of expert and novice fail to acknowledge the existence of performers who are no longer novices, but have neither become experts (Patel & Groen, 1991). Salthouse (1991), in fact, points out that attempts to further delineate developmental stages of expertise (into categories which denote beginning, intermediate and superior ranges) still encounter problems in determining boundaries between the categories.

Finally, the notion of "expert" tends to convey the notion of expert learners or problem solvers generally. Most research suggests that although experts may perform well in certain domains, they may just as likely be novices in others (Chi, Glaser and Farr, 1988).

In spite of these difficulties, and in spite of the fact that few attempts have been made to distinguish stages or phases that might exist between the two states (Shuell, 1990), the research dealing with the concept of expertise is

intriguing. It serves at a minimum to display what theoreticians such as Anderson (1983) have long suspected: that qualitative, not merely quantitative changes take place in learning and information processing. Studies of experts and novices in a variety of knowledge domains show that novices tend to rely on declarative knowledge in solving problems, whereas experts rely more on procedural knowledge. Even more intriguing, however, is the possibility that experts' reliance on the use of procedural knowledge represents a general attempt to circumvent human information processing limitations, and can therefore, help to account for how expertise is achieved in a variety of domains (Salthouse, 1991).

#### Moving from Novice to Expert: An Example

What might happen as learners move from novice to expert? Anderson's (1983) architecture and a training context will be used to illustrate this process. According to Anderson, a general scenario might begin with a learner encountering a large array of facts and pieces of information which appear to be isolated conceptually. In an attempt to cope with the information, the novice memorizes the facts and employs preexisting schemata to interpret the isolated data. At this point the learner is relying on general problem solving

strategies to make comparisons and establish analogies. The learner begins to piece together an overview of what the new information is all about. Analogies from other domains may be used to represent the new domain; prior knowledge is brought to bear on the new information being learned.

When Anderson's theory is applied to the specific situation of learning a new skill such as training, the training novice (particularly one who has taught previously) might begin to organize information about the task to be performed by using preexisting schemata which relate to teaching. Novice trainers may view workshop participants as analogous to students in one's class; the topic on which training is to be conducted as analogous to the curriculum.

Next in Anderson's theory, the learner begins to see similarities and relationships among the isolated pieces of new information. These similarities and relationships become bound into higher order networks and structures. New schemata may emerge.

Again, in the case of training, the novice may begin to become aware that certain of the previously used analogies need refitting or re-tooling. What previously appeared to be unrelated facts or information encountered in training task, now begins to take on new meaning in the context of a new



understanding of what training is all about. For example, a novice trainer preparing to deliver a workshop which has been scheduled for teachers from 4:00 pm to 6:00 pm immediately after school has ended, may consider information regarding the starting time and duration of the workshop as information of a purely scheduling or logistical nature. A more expert trainer would tend to see this information as a key to the type of learning activities that would need to be included in the workshop in order for it to have the greatest impact on participants. Expert trainers might more readily understand that from 4:00 pm to 6:00 pm, the teachers participating in the workshop would be tired, require active involvement in learning, and might be thinking of urgent chores awaiting them upon the workshop's completion.

Returning once again to the next level of Anderson's architecture, we see that the structures and schemata begin to function autonomously. Performance becomes automatized, unconscious and effortless, because relevant knowledge structures now control behavior in a more direct way. Learning that takes place in a particular domain once that domain has been mastered, will tend to add facts to the newly developed schemata, or will continue to raise the level of higher order interrelationships (e.g., schemata built of other schemata, rather than facts).

A match-up of this level to the after-school workshop context suggests that a training expert might begin to link previously successful after-school workshop scenarios with other types of difficult-to-deliver workshop scenarios to develop an even more applicable training workshop model.

#### Expert/Novice Behaviors in Different Domains

Concrete examples of expert and novice behaviors are readily found in a variety of domains. Studies of physics experts and novices, for example, show that experts tend to possess well-organized abstract knowledge for constructing problem representations, as well as specific knowledge for solving problems in domain dependent and procedurally efficient ways (Anzai, 1991; Chi, Feltovich and Glaser, 1981; Chi, Glaser and Rees, 1982).

Experts have been shown to analyze physics problems qualitatively prior to deciding which equation to use to solve them, their knowledge organized around a set of principles and abstractions that subsume the literal objects or facts given in the problem (Chi, Feltovich and Glaser, 1981). Novices, on the other hand tend to focus on the literal objects explicitly given in a problem statement (Glaser, 1984). In effect, experts call upon intuition and general principles extracted from past experience to help them solve problems, whereas

novices build solutions based primarily on the information given in the problem (Glaser, 1984).

Anderson (1990) would speculate that this problem solving expertise emerges because experts have learned how to represent problems in a particular domain in terms of abstract (not surface level) features that facilitate problem solving. In other words, experts appear to have a "road map" of sorts, which guides them in their problem solving efforts (Resnick, 1986).

O'Malley & Chamot (1990), report on several studies they conducted which explore the cognitive processes underlying second language acquisition and learning. These studies are important not only because they document learning strategies of "effective" learners, but also because they provide a framework for tying such strategies and skills to underlying cognitive processes and cognitive theory. In attempting to discern the types of learning strategies employed by language learners, O'Malley and Chamot describe several language classroom scenarios and ask learners to indicate the types of things they do to help them perform more successfully.

In these studies the learners' responses were categorized according to several types of strategy groups which are grounded in cognitive theory, and therefore, are closely related to underlying cognitive or information processes

(O'Malley & Chamot, 1990). The strategy groups are described as metacognitive, cognitive and social/affective.

The metacognitive strategy group closely mirrors processes found in the procedural knowledge system described by Anderson (1983) and includes items such as planning, selective attention, and monitoring, which exercise control over cognition. The cognitive strategy group also derives from the procedural knowledge system, but rather than exerting control over the learning process, this strategy group describes ways in which information may be stored in memory, accessed or related to other information. This cognitive strategy group includes such processes as imagery, inferencing, elaboration and transfer.

By examining learners' responses, O'Malley and Chamot (1990) were not only able to document the cognitive processes used by students in second language learning, they also discovered that differences between effective and ineffective students were reflected in the range of strategies used and the way in which individual strategies were used. A key finding of these studies was that effective learners used a higher proportion of metacognitive strategies than ineffective learners.

Differences between expert and novice readers and writers are explored by Scardamalia and Bereiter (1991). They report

that expert writers typically invest more effort in the construction of a problem representation, identifying goals constraints and governing principles. And, unlike the physics experts, whose initial attempts to construct a problem representation result in the problem being recognized as a familiar one, expert writers, by virtue of this extended problem representation, essentially turn the problem or writing task into a novel and more complex one. Expert writers run the risk of information processing overload. and, therefore, keep returning to planning, consulting top-level goals or global constraints and monitoring their progress in carrying out the writing task.

Scardamalia and Bereiter (1991) also point out that reading and writing interact with domain specific competencies in the advancement of expertise. They call these processes "dialectical" because of the two-way nature of the interaction. Expert writers have often testified that writing about a subject affects their knowledge and understanding of that subject; non-expert writers, however, rarely show that their knowledge of a subject has been influenced by writing about it (Bereiter & Scardamalia, 1987).

The notion of expertise is also found in discussions of cognition which include references to social/affective problem solving behaviors and skills. Smith and Baltes (1990) have

examined the concept of problem solving expertise from a life-span perspective, with special attention to adults. They state that while certain function related to expert problem solving behavior may decline over time (in particular, functions such as maximum levels of performance at very fast rates of speed), there is often an increase in the ability to perform domain-specific problems which receive greater practice in adulthood. Smith and Baltes cite problem solving areas such as social, personal and professional as the areas in which problem solving skills are practiced by adults.

Researchers have also applied this expert-novice framework to teachers' knowledge systems (Berliner, 1986; Borko & Livingston, 1989; Calderhead, 1984; Kagan, 1988; Magliaro & Borko, 1985; Shavelson, 1986; Shavelson & Stern, 1981). Kagan (1988), for instance, traces the development of the teacher cognition paradigm to the research which examined physicians' behavior as they moved from patient intake to diagnosis. Described in the medical literature as decision sequences or decision-chains, this research paradigm initially seemed appropriate to apply to the study of teacher cognitions. After all, teachers had many decisions to make - from what should be taught, when, and how - to the type of minute to minute problem-solving, managerial decisions that would be required in an on the spot basis in the middle of

classes being taught. However, many researchers began to discover that teachers tended not to make many decisions (defined as any thoughts which preceded actions) or alter plans once a lesson was undertaken (Kagan, 1988). The discovery of automatized or routinized behavior has been further documented by research from another corner: studies which compare the interactive cognitions of experienced (or expert) versus novice teachers (Livingston & Borko, 1989). The convergence of these two findings permits the speculation that teachers tend not to make step-by-step decisions in their classroom interactions with students; that teachers, particularly experienced or "expert" teachers appear to have arranged their knowledge of students and classrooms in particularly effective ways (schemata) that can be accessed unconsciously from long-term memory via classroom clues. Experienced teachers use these patterns to interpret classroom events and to decide which routines to use.

Borko and Livingston's exploration of teacher cognitions examines the planning, teaching and postlesson reflections of expert teachers and novice teachers. Their findings suggest that expert teachers tended to have more fully developed pedagogical content knowledge systems.

In effect, one might view these systems as proceduralized knowledge systems, replete with stores of powerful

explanations and activities which can be used in presenting content matter to students. In addition, the content, pedagogical and student knowledge systems of experts tend to be more interrelated; experts can predict which students might have trouble with certain concepts, for example, and draw on appropriate examples or explanations which would be most meaningful to those particular students. Novices, on the other hand, tend to have fewer reserves to draw on. The novices spend much longer than the experts in developing an example to explain a particular concept.

The differences observed by Borko and Livingston permit the speculation that experts' cognitive schemata are more elaborate, more interconnected and more accessible than those of novices. The differences seen in expert and novice teachers illustrate the development and use of higher principles and abstractions suggested previously in studies of physics experts. They also suggest that parallel behaviors may be present in training professionals.

#### Application of the Literature on Cognition and Expertise to Trainers' Preactive Planning Strategies

The widespread evidence of expert behaviors observed by researchers in an assortment of learner classes and knowledge domains leads to the conclusion that similar types of expert



behaviors may also exist and be observable in training professionals. The question is, can these behaviors be shown to relate to the underlying mental processes which are explicated in cognitive theory?

O'Malley and Chamot's (1990) previously mentioned framework relates the learning strategies of students learning or acquiring a foreign or second language to Anderson's (1983) information processing theory of cognition. The framework was constructed by identifying learning strategies which emerged from the research in cognitive psychology based on interviews with experts and novices, from interviews with good language learners, and from theoretical analyses of reading and problem solving. Although Anderson's theory does not speak directly to social/affective strategies, O'Malley and Chamot found that these strategies had been previously identified in the language learning literature and, therefore, chose to include them in their framework.

O'Malley and Chamot constructed their framework by differentiating the strategies into three categories, depending on the level or type of information processing involved: metacognitive, cognitive and social/affective. The strategies listed in each of the categories were tied specifically to tasks and task conditions which language

learners might encounter, but were derived from more global learning or information processing tasks, as evidenced below.

For example, the metacognitive category included strategies defined by Brown and Palincsar (1982) as higher order executive skills which plan, monitor and evaluate the learning activity. These strategies included:

- selective attention for special aspects of a learning task
- planning the organization of spoken or written discourse
- monitoring attention to a task (e.g., information that should be remembered; monitoring production while it is occurring
- evaluating or checking comprehension or evaluating production

The cognitive category contained strategies defined as those which operate directly on incoming information, manipulating it to enhance performance. They include:

- rehearsal, or repeating the names of items or objects
- organization, or grouping and classifying material or concepts

- inferencing, or using information to guess meanings of new items, predicting outcomes or completing missing parts
- summarizing, or synthesizing information to ensure the information has been retained
- deduction, or applying rules to understand information
- imagery, or using visual images (either generated or actual) to understand and remember new information
- transfer, or using known information to facilitate a new learning task
- elaboration, or linking ideas contained in new information or integrating new ideas with known information.

The social/affective category represented strategies which involve interaction with another person or ideational control over affect. These strategies are:

- cooperation, or working with peers to solve a problem, pool information, check notes or get feedback
- questioning for clarification or additional information, explanation or examples

- self-talk, or using mental control to assure oneself that an activity will be successful or to reduce anxiety about a task.

Because O'Malley and Chamot (1990) developed this framework specifically with the intent to reflect underlying mental processes found in theories of cognition and information processing, it appears that the removal of domain-specific references to language learning render it capable of being used to sample information processing and problem solving skills generally. By contextualizing the strategies listed in the framework to a training setting, this list of strategies would provide a sound theoretical base for tapping into trainers' information processing and problem solving skills.

### Review of the Training Literature

As mentioned previously, the training literature comprises both the literature on staff development and the literature on human resource development. Information about the psychological processes employed by trainers is virtually nonexistent in the staff development literature and scant in the HRD literature. Trainers appear to have few sources of information to guide them in reflecting on their own day-to-day practice (Watkins, 1990).

For example, a review of the staff development literature shows that there is no available information about the nature of trainers' cognitive processes. There is some information, however, about the importance of the cognitive processes of those who participate in inservice training or staff development. Recent writings in the staff development literature have begun to underscore the importance of **teacher** cognition in the teacher training process (Crandall, 1982; Good, 1986; Showers, Joyce & Bennett, 1987; Sparks, 1984).

The human resource development (HRD) literature, on the other hand, has begun to explore the importance of the trainers' cognition as a key factor in the success of training (Broadwell, 1990). Like the staff development literature, however, the HRD literature reveals little descriptive or empirical data on the training process itself, and instead provides advice on how to conduct training (Bard, Bell, Stephen & Webster, 1987; Mitchell, 1987; Warshauer, 1988). This "how-to" information (although quite abundant) often lacks either a theoretical base and/or rigorous scrutiny of the methods being proposed.

In fact, the scientific study of training is clearly in its infancy, evidenced by the very recent (1990) publication of the first scholarly training and human resource development (HRD) journal. In an editorial contained in the first issue of

this newly developed journal, Human Resource Development Quarterly, Swanson (1990) states,

As a scientific community, HRD scholars have watched in amazement as unsubstantiated claims about HRD have been waved before decision makers; we for the most part, looked away....The time has arrived for HRD scholars to start turning their heads away from unsubstantiated claims by providers of HRD intervention. We need to start asking several direct questions of those who present paranormal claims and report our findings to the profession.

This recognition of the need for an empirically derived foundation in training underscores the dearth of scientific evidence about training processes.

One of the few studies which examines trainers' thoughts does so in the context of exploring trainers' beliefs about training. Watkins' (1990) study reveals that the implicit beliefs that trainers hold about training may impede their effectiveness. Fifty-seven trainers in three organizations (other than schools or school district settings) were interviewed using five open-ended questions which addressed their beliefs and perceptions about barriers to learning in their organizations, critical incidents of a recurring problem in their practice, critical incidents of a learning project, and the characteristics of successful learners in their organization.

The trainers' responses indicate that many trainers see training as a "magical process," the result of fate or luck, rather than something which is within their control. Trainers believe that training is something you are either born with or are lucky enough to be able to figure out on your own. While Watkins' (1990) study does not specifically examine the responses of expert versus novice trainers, she reports that the majority of references to training as magical were made by "those (trainers) who looked at experts and held them in awe in a way that appeared to relieve them of the responsibility of attempting to achieve a similar level of expertise," (p.270). This particular finding may be partially explained by the fact that fewer than 10% of human resource trainers have actually received formal instruction on training themselves (Lee, 1985).

One other study (Maddocks, 1991) has emerged very recently in the HRD literature, and appears to be the first to examine the cognitive nature training by using the expert-novice framework. In her doctoral dissertation, Maddocks (1991) examined the differences between expert and novice trainers in their knowledge and problem solving strategies in order to uncover key areas on which to focus trainer development programs.

Two expert and two novice trainers were selected to complete a series of problem solving tasks using a think aloud approach. The tasks were based on training competencies identified by the International Board of Standards for Training, Performance and Instruction and included such skills as the ability to analyze course materials and learner information, assure preparation of instructional site, establish and maintain instructor credibility, and use media effectively.

Maddocks analyzed the amount and type of knowledge each trainer possessed as well as the variety of ideas that each generated. In addition, the number of cues, problems and solutions that the subjects identified were counted and categorized. Maddocks (1991) found that the amount and range of knowledge of experts was much greater than that of the novices. She also found that the experts perceived cues that novices did not see, and further, used these cues to monitor their performance on the tasks. In addition, Maddocks (1991) also found that the experts took longer and seemed to struggle with the tasks, striving for a perfect fit.

Although many of the conclusions generated by Maddocks' (1991) study support the findings on expertise in other domains, Maddocks fails to tie the tasks given to the trainers to any underlying unified theory of cognitive development or



expertise. Thus, her findings, while important and revealing, fall short of suggesting an explanation of how training expertise may develop.

While we are still in need of additional descriptive and empirical information about training processes and training professionals, it seems apparent that the role played by cognition in both trainers and their audiences is one which may provide the foundation from which a training research base is ultimately built.

### Teacher Cognition

The literature on teaching (Berliner, 1983; Clark & Peterson, 1986; Clark & Yinger, 1979; Shavelson & Stern, 1981;) has experienced a significant shift in focus in the past decade. It has moved from an almost exclusive emphasis on the study of overt teaching behaviors to a more balanced study of both teaching behavior and teacher thinking. This emergence of information on the psychological context of teaching, which includes a descriptions of the thinking, decision making and planning processes that teachers use, might serve as a practical framework from which to begin a study of similar processes in training professionals. This section will examine the literature on teacher thinking, decision making and planning.

Since teacher behavior has been shown to be substantially influenced and even determined by teachers' thought processes (Clark & Peterson, 1986; Clark & Yinger, 1980; Shavelson & Stern, 1981), a major goal of the research on teacher thought processes has been to increase our understanding of how and why the process of teaching looks and works as it does. Models of teachers' thought processes have focused on describing teachers' implicit theories about the teaching and learning process, teachers' interactive decision-making and teachers' planning processes.

#### Teachers' Implicit Theories About Teaching and Learning

Personally held systems of beliefs, values and principles of practice comprise what is described as teachers' implicit theories about the teaching and learning process (Clark & Peterson, 1986). Research on teachers' implicit theories constitutes the smallest and youngest part of the literature on teacher thinking (Clark & Peterson, 1986), yet Munby (1982) suggests that an understanding of this topic is essential in order to gain a complete understanding of thought processes in teaching. An examination of teachers' implicit theories makes explicit and visible the frames of reference through which teachers perceive and process information.

Although unequivocal conclusions about teachers' implicit theories are difficult to generate, one thing is clear: teachers do seem to hold implicit theories about their work (Clark & Peterson, 1986). Although there may be wide variation in the content and orientation of these implicit theories, teachers' instructional behavior is usually congruent with their theories of instruction (Brophy, 1980). In addition, researchers have noted that changes in teachers' implicit theories over time are generally based on their experiences, rather than exposure to formal instruction such as that received in methods courses (Bawden, Buike & Duffy, 1979).

#### Teachers' Interactive Decision Making

Research on teachers' thinking has attempted to describe the thinking that teachers do while interacting with students in the classroom. Although some researchers have attempted to describe the content of teachers' interactive thoughts generally, teachers' interactive decision making processes have been more fully explored (Fogarty, Wang & Creek, 1983; Leinhardt & Greeno, 1986; Peterson & Clark, 1978; Shavelson, 1983). Commonly concerned with the conscious choices that teachers make during classroom instruction, the research on interactive decision making has attempted to "map" these

decisions, describing influences on and cues used to make the decisions (Clark & Peterson, 1986).

Both Peterson & Clark (1978) and Shavelson & Stern (1981) attempted to describe models of teachers' interactive decision making. Both these models involve teachers' observation of classroom cues (student behaviors), as well as a judgment of whether these cues are within tolerance (e.g., students are understanding the lesson and participating appropriately). However, Shavelson & Stern's (1981) model is one which characterizes teaching as carrying out a set of well-established routines. This model draws heavily on the information processing approaches previously developed by cognitive psychologists. In effect, Shavelson & Stern (1981) liken these teaching routines to a computer subroutine which minimizes conscious decision making during teaching and effectively reduces the information processing load.

While these two models of interactive decision making helped to inform the empirical research which has been conducted, Clark & Peterson (1986) point out that neither model has proven to be sufficient. First, the definition of interactive decision making needs to be revised to reflect the fact that such decision making involves making a deliberate choice to implement a specific action, rather than making a choice of an action from several alternatives. Second, and

perhaps, more important, Clark & Peterson (1986) suggest that a model of interactive decision making should reflect the findings of empirical research: the majority of teachers' interactive decisions are preceded by factors other than judgments made about the student. These factors might include judgments about the teaching/learning environment or the appropriateness of a particular teaching strategy.

#### Teacher Planning

The fact that the research on teachers' interactive decision making has pointed to the importance of antecedent conditions in influencing teacher thinking and behavior has led many researchers to consider the study of teacher planning. The study of teacher planning is important for four reasons (Clark and Yinger, 1980). First, teacher planning shows the relationship between thought and action in teaching. Second, planning is a topic of concern to practitioners, who indicate that planning for instruction is a very important part of their work. Third, planning offers insights into teachers' implicit theories of teaching and learning by shedding light on the pedagogical ideals they hold for themselves and their students. Fourth, planning serves as a link between the research on curriculum and the research on teacher behavior. By studying how teachers bring curriculum

and instructional performance together during planning, evidence of teachers' pedagogical content knowledge becomes more apparent.

A fundamental assumption in the research on planning is that teachers' plans influence the perceptions and judgments they make about the goals and objectives of instruction, the learning experiences they design for their students, and the procedures and resources they use for organizing and managing instruction (Armour-Thomas, 1989). Zahorik's (1975) classic study of teacher planning found that teachers' decisions were concerned with pupil activities and instructional content, followed by a concern for learning objectives. Peterson, Marx and Clark (1986) examined teachers' thinking aloud prior to their planning and found that decisions most frequently made were about subject matter, followed by instructional processes (strategies and activities) and instructional objectives.

Both of these studies serve to illustrate that the way in which teachers plan does not conform to traditional prescriptions for planning. In these traditional approaches, the teacher typically begins with a specific learning objective, generates alternative ways of meeting the objective, and chooses the best alternative. As Clark & Yinger (1980) point out, this is the way teachers are taught to plan, but it simply does not take place.

In an effort to more fully describe the planning process, Yinger's (1978) study of teacher planning traces the planning decisions of an elementary teacher during five months of classroom instruction. Both ethnographic and information-processing approaches are used to describe distinctive features of the teacher's planning technology and to develop two models of planning: a structural model and a process model. The structural model identifies five levels of planning (yearly, term, unit, weekly and daily). The process model delineates decision processes included in a design cycle consisting of three stages:

- problem finding (or initial problem conception),
- problem formulation/solution and
- implementation, evaluation and routinization.

Yinger found that routines are an important part of the planning process for this teacher. In effect, these routines lessen the planning burden by reducing the number of activities or activity features she has to plan on a regular basis.

Lowyck's (1986) studies of teacher thinking reveal that planning takes place through a series of successive steps, but

in a cyclical way. He documents five steps in the process including:

- inspection of the assignment
- acquisition of content by teachers
- determination of content for pupils
- organization of lesson
- designing a definite lesson plan.

In each step, two different types of behavior occur: the use of routines and the use of problem solving behaviors or strategies.

Lowyck, however, also includes the post-teaching thoughts of teachers in his studies of teacher thinking. Post-teaching (or post-interactive) thoughts are also generally included as a part of teacher planning (Clark & Peterson, 1986), because they appear to guide teachers' thinking and projections for future interactions with students. Lowyck discovered that post-teaching reflection is instigated mainly by negative experiences. In other words, the gap between expected and realized behaviors is the source of most post-interactive thinking by teachers. In addition, he found that teachers report different types of post-teaching reflection including thinking about individual pupils, the class as a group (i.e., their level of knowledge, level of motivation, interest and



involvement), their own teaching behavior, lesson organization and lesson content.

What becomes clear through an examination of the research on teacher planning is that an understanding of the information processing or problem solving strategies of teachers provides us with important clues about the nature of teacher planning. In turn, since planning seems to contribute greatly to overall teacher performance, a better understanding of the information processing or problem solving skills and strategies used in planning would contribute greatly to a better understanding of overall teacher performance.

#### Applicability of the Literature on Teaching to Trainers

Any study of trainers' thought processes must necessarily begin by exploring whether the research conducted with teachers might also apply to training professionals. Training professionals, operate in many ways like teachers. They require content knowledge and pedagogical knowledge. They must design and provide learning experiences that shape subject material to the needs and capabilities of the learners they teach. Nevertheless, the problem solving skills of trainers are employed to solve problems which are somewhat different from those of teachers.

Teachers who work in K-12 settings generally teach to a set of district or school level objectives in any given subject area. They are certain prescribed goals and objectives toward which they aim as they select content and design instructional activities. Teachers, particularly elementary teachers, generally have access to at least one constant body of subject material (basal reader, district selected mathematics program) for any given instructional area. While teachers may not always be happy with the material, and may choose to supplement it with other material, this core material generally serves the purpose of showing even beginning teachers what concepts the students will be expected to learn.

Trainers, on the other hand, have no such guideposts. When asked to prepare a workshop, they are held to no district or school level standards. Although the school or district may provide some information on the general topic they wish their teachers to learn, the selection of goals and objectives, learning activities and materials is generally left to the trainer. The choice of what to teach, the level of instruction, and the form that instruction will take must be created by the trainer.

When teachers think about their audience of students, they do so with knowledge that has grown over time. They have

seen and worked with students over a period of time. They have observed them learning and working in a variety of settings. Training professionals do not usually have access to a population of participants over long periods of time. They must find ways to discern their audience's needs and capabilities without benefit of long term observation and interaction.

Teachers, particularly those who work in K-12 settings, are generally working with young children or young adults. Their students are obliged to be in school by law (except for those students 16 or older).

Trainers face a different set of problems. They must find ways to make instruction meaningful to an adult population of students who in many cases are the trainer's peers. Although some schools may require teachers to attend a particular workshop, attendance at workshops may be voluntary in others. Trainers must find ways of not only attracting participants, but also keeping them. Adult participants in many training workshops "vote with their feet." If a workshop does not meet their expectations or needs, they leave.

While not all teachers working in K-12 settings enjoy comfortable physical settings in their schools or classrooms, for the most part, the settings they teach in are constant. Trainers, in contrast, must find ways to combat the logistical

nightmares associated with providing training in many different locations, in a variety of physical settings. These physical settings may, in fact, impact on the trainer's ability to provide certain types of instructional activities (e.g., trying to conduct a cooperative learning activity in groups in a physical setting where the chairs are arranged theater style and nailed to the floor).

Perhaps the most crucial difference between teachers and trainers is that most trainers must find their own way of learning the art of training. Teachers may spend the last two years of college acquiring pedagogical skills before entering a classroom; they generally continue their formal study of teaching through inservice training sessions or graduate classes once on the job. Most trainers of teachers move into their training positions from the classroom. Some may have some formal instruction in training; most don't. Although no studies of trainers' preparation are available for trainers who work exclusively in school district settings, Lee's (1975) study showing that less than 10% of human resource development trainers are actually trained in the field is probably reflective of the experience of teacher trainers as well.

Trainers, therefore, must find ways of creating accurate representations of training out of the prior experience that they have had (in some cases, as teachers), look for ways of

turning the declarative knowledge that they have about training and/or the content of training into the procedural knowledge of how to train. They must develop "pedagogical content knowledge" systems which are rooted in a training context. Finally, they must compile and fine tune the knowledge that they have into more sophisticated production systems which permit more efficacious performance.

Because the differences in the interactive **settings** of teachers and trainers seem vast, an application of the teacher literature to trainers in this particular regard seems ill-advised. However, because both teachers and trainers plan for instruction, and planning seems to be so central to the interactive behaviors that follow in both teachers and trainers, planning seems a logical place to begin to compare the two groups.

Studies of teacher planning are well documented in the literature on teacher thought. Methods for describing teacher planning are well-tested; frameworks for examining teacher plans are well-described. By adjusting the information gathered in the teacher planning research to more closely conform to the particular constraints and characteristics of training tasks outlined above, instruments which tap into trainers' planning processes could be successfully designed and administered. The data gathered would allow a description

of trainer planning to be developed which portrays how trainers think and how they plan. Once this description is constructed, it might eventually be compared to the research evidence that has been previously gathered about teacher planning to confirm the ways in which teaching and training are similar or different.

## CHAPTER THREE

### METHODS

#### Overview

Because there is so little information available on the cognitive processes of trainers (Maddocks, 1991), this study of the preactive planning strategies of expert and non-expert trainers employed a design which collected both quantitative data (gathered through the use of a questionnaire and a short demographic survey) and qualitative data (gathered through "think aloud" interviews with three trainers who had been nominated as experts by their peers).

The quantitative portion of the study was modelled on studies of second language learning strategies conducted by O'Malley and Chamot (1990). In fact, the questionnaire used to gather the data (although tailored to training circumstances) was very similar to questionnaires used by O'Malley and Chamot in their learning strategy research.

The qualitative data was gathered using think aloud techniques which also mirrored those of O'Malley and Chamot (1990), although the use of think aloud protocols was pioneered in early studies of chess experts (de Groot, 1978), and has been used routinely in other studies of expertise in a variety of fields over the years (Ericcson & Simon, 1984).

The think aloud technique (in which subjects are asked to report their thoughts during task performance), is thought to provide rich process information (Olson & Biolsi, 1991).

### Research Question and Research Hypotheses

The availability of both qualitative and quantitative data permitted the exploration of a research question and provided the opportunity to test two research hypotheses.

The research question explored by the study was:

What information processing strategies do trainers generally report using during the preactive planning phase of training?

The research hypotheses which were tested were:

H<sub>1</sub>: Expert trainers will use a significantly different proportion of metacognitive strategies than non-expert trainers in the preactive planning phase of training;

H<sub>2</sub>: The categorization of trainers as "experts" can be predicted by variables such as prior teaching experience, prior training experience and prior coursework or study of teaching and/or training.

### Background of the Study

Much of the research conducted on expert behavior, problem solving and information processing has one thing in



common: it has traditionally begun by gathering information on the way in which very small samples of subjects think and behave. Small studies of this kind, which use as few as one subject, provide guidance in the identification of issues along which critical lines of distinction may be drawn.

This study, like the research just mentioned, began by examining information collected during a small pilot study which explored the training process with a group of five teacher trainers attached to a federally funded training center. The pilot study, which consisted of two phases, examined the preparation and delivery of training. The first phase consisted of one-on-one structured interviews in which trainers were asked about the processes they used in planning and delivering training. The interviews focused on what the trainers did to prepare themselves for training, what they did if a question came up for which they did not have an answer, how they could tell if a session was going well, and what they felt to be the most difficult part of training.

The second phase of the pilot consisted of the administration of a multiple choice questionnaire on workshop preparation and delivery in which participants were asked to rank a group of responses to questions in their order of importance. Participants were also given an opportunity to add responses to the given list. The questionnaire explored the

strategies they used in preparing workshops, the type of information they felt was most useful to know about the audience in terms of workshop planning, and the thing that made them nervous or frightened about giving a workshop. The results of this preliminary study were used to develop the research question and hypotheses of the current study, and were also been used to guide the development of data collection instruments and techniques.

#### Overview of The Present Study

The quantitative phase of the study began by sending a questionnaire and demographic survey to 104 teacher trainers who were all employed at sixteen federally funded bilingual education training centers. In all, 78 trainers responded to the questionnaire.

The questionnaire asked about the planning strategies the trainers would use in five distinct training settings. The settings were workshop planning scenarios. In addition, the questionnaire contained a section that gathered demographic information on each of the participating trainers.

This quantitative information was augmented by the qualitative data collected through the think aloud interviews, during the second phase of this study. The think aloud

interviews were conducted with the three trainers who had received the highest number of votes (four) from their peers as the best trainer. The think alouds were conducted by telephone and were audiotaped for later transcription and analysis.

#### The Term "Expert:" Some Assumptions and Some Limitations

In this study, the term "expert" is used to describe those trainers who had received three or four nominations from their peers as the best trainer in a given center. The term non-expert (rather than novice) is used to describe those trainers who received fewer than three nominations, due to the fact that all trainers were working professionals who trained for a living and were not, in the traditional sense, novices. Although the terms expert and non-expert suggest a dichotomous relationship, it is more likely that some continuum of expertise exists along which trainers could be placed.

It should also be stated that the nominations for expert stem from *perceptions* of expertise that arise from a specific training context and general training content, rather than some standardized measure of general training excellence. The characteristics of the trainers who were nominated as experts reflect the reality of the individual training center contexts as well as the training content and format of workshops

normally provided by such centers. It might be that experts in other contexts (e.g. business settings) who provide training on substantially different topics (e.g., developing interpersonal skills to ensure customer satisfaction or conflict resolution in the workplace) would exhibit different characteristics than the experts in this study.

### Subjects

The subjects for this study were the 104 teacher trainers attached to a group of sixteen federally funded training centers located throughout the United States, Puerto Rico and Guam. Each center is funded through Title VII of the Elementary and Secondary Education Act, the Bilingual Education Act. The training centers are specifically funded to provide training to school district personnel serving limited English proficient and language minority children. In addition, the centers provide training designed to prepare project directors to accomplish the management tasks associated with the successful implementation such instructional projects.

Each center employs between four and nine trainers who are all full or part-time training professionals. Only one center has four trainers, two have five trainers, four have six trainers, two have seven trainers, five have eight

trainers and two have nine trainers. All of the trainers train teachers on a regular basis; training is an integral part of the job description of each. These trainers provide workshops and technical assistance on a wide variety of topics: English as a Second Language teaching methodologies, first and second language acquisition, techniques for teaching content areas such as math, science and social studies in both first and second language settings, literacy development, cultural awareness and sensitivity, parent involvement, and project management. The trainers provide this training primarily for teachers, project directors and other educational personnel working in school districts serving limited English proficient students.

### Procedures

The director of each of the sixteen training centers was contacted by telephone in order to explain the purposes of the study and secure permission for their staff to participate in the study. All directors were also asked for an up-to-date roster of all training specialists attached to their center. Each provided this information.

Once the directors had been contacted, a workshop preparation questionnaire containing five training scenarios was sent to each of the trainers at the sixteen centers. The

questionnaire included a short demographic survey which asked for basic personal background information such as number of years (if any) of previous teaching experience, grade levels taught, number of years the trainer had trained, and the number and types of training courses taken. Also included was a question which asked each respondent to nominate the "best" trainer on staff at their particular center. Respondents were instructed that they could nominate themselves. The final question asked the trainers to describe the skills or abilities exhibited by the person nominated that contributed to the feeling that this person was the best.

Of the 104 trainers (including each center director) working at the centers at the time of the study, sixty-seven trainers (64%) responded to the first mailing of the questionnaire. Follow-up letters and surveys were mailed to those trainers who failed to respond initially. The second round of mailing yielded 11 additional responses for a total of 78 responses (a 75% response rate).

Once the follow-up was completed, the nominations for "expert" trainers were computed. Fifty-three percent of the trainers who responded received no nominations or votes as experts; 28% received one vote; 12% received two votes; 4% received three votes and 4% received four votes. Because there appeared to such a clear indication of expertise emerging at

the 3 vote level, the cut-off for experts was set at three votes.

It should be noted that an examination of the number of votes for experts received by the non-respondents showed that they were somewhat different from the trainers who responded to the questionnaire (84% of the non-responding trainers received no votes as an expert versus 53% of responding trainers; 12% of the non-responding trainers received one vote each as an expert versus 28% of the responding trainers).

#### The Nomination Process: Some Caveats

The process of determining experts is a difficult task; the nomination process is one that is far from ideal. Although Berliner (1986) includes reputation among peers as a method for identifying expertise, he combines this technique with others including observation by independent observers and performance in laboratory tasks as other methods of identifying expertise. Unfortunately, because little research has been conducted on the nature of training expertise, the essence of superior performance in training has not yet been identified and/or standardized, rendering the techniques of observation and performance on laboratory tasks unworkable alternatives for capturing expert performance in the present study. Because the nomination process was used as the sole

criterion for determining expertise in this study, it should be noted that the process is one that is not without substantial problems.

For example, it is possible that the nomination process might have depended on the reputation that trainers had established in a given center, rather than direct observation of trainers by their peers. However, since the trainers in each center generally have opportunities to observe one another providing training, especially during yearly regional workshops, this was probably not the case. In addition, the training centers usually provide long-term on-going training programs in assigned school districts, so trainers usually have the opportunity to follow-up on training provided by one another.

It might be argued that the nominations for expert might also be more reflective of the characteristics and variability of the training center at which trainers are based, rather than the expertise that trainers possess. For example, if a training center were characterized by a hostile atmosphere, where competition rather than cooperation ruled the day, trainers might be reluctant to nominate one another. In such a case, the nomination process would fail to detect trainers who might be experts, but who had not been nominated by their peers. Finally, in the case of centers with small training



staffs, it could be that nominations for two or more trainers resulted in *no* trainer gaining three votes, even though it is possible that two or more trainers could have conceivably been experts.

It is likely, therefore, that although those trainers nominated as experts in this study probably are experts, there may be other expert trainers working at the training centers surveyed who were not captured as experts by the nomination process. Although the labels of "expert" and "non-expert" are used throughout this study, it must be cautioned that these terms are relative. It is more probable that rather than the dichotomous description of expertise invoked by this study, there exists some continuum of expertise along which these trainers could ideally be placed. Our limited knowledge of expertise, however, precludes such placement at this time.

### Instrument/Data Collection

Data was collected in two ways: by sending a workshop preparation questionnaire and demographic survey to all trainers, and by conducting think aloud interviews with the three trainers receiving the highest number of votes as an expert. Each of these techniques will now be discussed.

### Questionnaire and Demographic Survey

The workshop planning questionnaire (see Appendix A for copy of questionnaire) provided five training scenarios and asked trainers to indicate how frequently they used certain planning strategies using a Likert-type scale (never, rarely, sometimes, often, always). The questionnaire was based on questionnaires previously developed and administered by O'Malley and Chamot (1990), in their studies of second language learning strategies.

Two of the planning scenarios focused on workshop topic, two on workshop audience and the final scenario focused on the post-workshop reflections of the trainers. The two scenarios on workshop topic were identical except for one distinguishing characteristic - that of the trainers' familiarity with the topic. In the first topic scenario, trainers were told that they were preparing a workshop on a topic on which they had presented previously. In the second, the trainers were told that they were preparing for a workshop on which they have never previously presented.

Likewise, the two workshop planning scenarios on audience were identical except for the distinguishing characteristic of familiarity with the type of audience for whom the workshop was being prepared. In the first scenario, trainers were told that they were preparing a workshop for a group with whom they

worked previously; in the second scenario, trainers were told that they were preparing a workshop for a group that was new to them.

In the final training scenario, trainers were told that they had just finished giving a workshop that they would present again in the near future. This training scenario was the only one that did not vary familiarity of topic or audience.

The development of familiar and unfamiliar workshop scenarios had a special significance to the first research hypothesis tested by this study. Because the research on expertise has shown that routinization of problem solving strategies occurs when an expert learner or problem solver has encountered a particular problem type previously, it becomes more difficult for the problem solver to extract or articulate the types of strategies employed to solve the problem. By providing a workshop preparation vignette which controlled for familiarity with topic or audience, it was possible to view the answers of both experts and non-experts in two scenarios: one in which the trainer was familiar with the topic, the other in which the trainer was not familiar with the topic. By examining the types of strategies used by trainers in each of these topic vignettes, it was possible to analyze the

proportion of metacognitive strategy use for experts and non-experts in both familiar and unfamiliar settings.

All items on the questionnaire were coded according to strategy category and strategy type. The researcher was assisted in this procedure by Anna Uhl Chamot, one of the principals of the second language learning strategy research mentioned previously. A listing of the strategy categories and strategy types may be found in Appendix A.

The demographic survey asked trainers to provide information on their prior experience as trainers and teachers (e.g., number of years training, number of years teaching, grades levels taught). It also asked for information related to prior formal study of both teaching and training (e.g., coursework completed or seminars taken).

Both instruments were pilot tested on ten professionals who train on a part-time or consultant basis in settings similar to those in which the subjects worked. Revisions in the instruments (clarifying the instructions, sharpening the questions), were made on the basis of input and feedback received on the pilot.

#### Think Aloud Interviews

Qualitative methods often offer a means of uncovering and better understanding what lies behind certain phenomena

(Strauss & Corbin, 1990). In addition, qualitative methods offer the possibility of shedding light on the intricate details of such phenomena. In a preliminary study such as this one, qualitative methods may provide us with clues that help to better define the nature of research questions that need to be asked and explored in the field of training expertise. Therefore, this study included a qualitative section congruent with other cognitive research that has been conducted previously.

Cognitive research generally employs characteristic methods that differ greatly from those used in correlational and experimental studies of previous process-product research (Shavelson, Webb & Burstein, 1986). The methods, such as process tracing, policy-capturing, lens modeling, and stimulated recall use more or less direct probes of thoughts, judgments and decisions.

Process tracing refers to verbal report methods that attempt to obtain data on the intellectual processes used by individuals as they make decisions, or solve problems (Shulman and Elstein, 1975). One of the most commonly used forms of process tracing is the "think aloud" interview, in which a subject is asked to think aloud while performing a task. This method produces a verbal (and sometimes written) protocol which serves to characterize the subject's thought processes.

Although not appropriate for all kinds of tasks, Ericsson and Simon (1984) have concluded that situations in which verbal information is produced while one makes inferences to oneself, or in which salient features of the objects of the situation are identified, yield acceptable think aloud data. Ericsson and Simon (1980, 1984) have also compared the performance of subjects who gave think aloud protocols with the performance of those who did not verbalize, and have shown that the processes were identical.

Examples of think aloud interviews abound in the literature on expertise and planning. In a study of teachers' instructional planning, for example, (Peterson, Marx & Clark, 1978), teachers were asked to think aloud as they planned their social studies lessons. Tape recordings of these planning sessions were then analyzed and coded by the researchers. Likewise, studies of second language learners conducted by O'Malley and Chamot (1990) employed think aloud procedures as expert learners talked about the strategies they used to learn a second or foreign language.

The second phase of data collection for this study consisted of conducting follow-up think-alouds with the three highest ranked training experts. The experts were contacted by telephone, told that they had been named as experts by their peers and were asked if they would be willing to

participate in a follow-up think aloud interview at a time when they would be planning for an upcoming workshop. The choice of workshop to be planned as well as the date and time of the think aloud interview was left up to the experts. On the appointed day, the think alouds were conducted by phone and audiotaped for transcription and later analysis (see Appendix B for complete transcriptions of the three think aloud interviews).

Conducting think aloud interviews by telephone is a critical departure from the way they have been conducted traditionally and may be seen by some as problematic. However, Frey (1989, p. 23) explains that a number of factors such as "cost, time and compromises in data quality attributable to the social context [of the face-to-face] interview have forced many researchers to abandon face-to-face methods for the alternative of telephone interviews." Cost and time were certainly factors that intervened in this study.

Some may contend that the use of the telephone to conduct interviews or surveys may be inhibiting or anxiety-producing (Frey, 1989). However, Frey (1989, p.20) also states that, "...if [telephone interviews are] done skillfully, trust is established." It should be noted that the researcher knew all three of the experts personally and had worked with each prior to the time of the think aloud. This fact may help to mitigate

some of the problems stemming from the use of telephone interviews or surveys in other cases. In addition, a comparative meta-analysis of data quality in telephone and face-to-face surveys conducted by de Leeuw and van der Zouwen (1988) shows only small differences in the type of data generated by telephone and face-to-face interviews. Furthermore, these differences have become smaller over time.

Planning think alouds of the type employed by this study go beyond the scope of most telephone interviews. In fact, a review of the research on think alouds revealed no evidence that the think aloud format had been previously employed via telephone. Conducting a think aloud interview by telephone might not be advisable in many (or even most) cases; however, in the case of the training experts in this study, it must be remembered that all worked at regional training centers, and therefore, engaged in extensive telephone contact (including needs assessment and workshop planning) with clients on a regular basis. The experts were accustomed to using the telephone to gather information, problem solve and plan.

The think alouds took place in a structured interview format, in which trainers were asked to relate what they were thinking as they planned. Each expert was also asked if the processes they had just related were representative of the way they usually plan. If trainers responded negatively, they were



then asked to report the ways in which they think the think aloud planning session was different from their usual planning processes. These two questions helped to ensure that the processes reported by trainers in the think aloud were not simply artifacts of the think aloud process itself.

### Analyses

The analyses performed to answer the research question and test the research hypotheses of this study will now be described. First, a general description of the exploratory data analyses will be provided. Next, a description of the analyses used to answer the research question and each of the research hypotheses will be furnished.

#### Exploratory Data Analyses

Exploratory data analyses were performed on all quantitative data collected in the workshop preparation questionnaire and demographic survey. Means, standard deviations, ranges, frequency distributions, histograms and cross tabulations were computed for each question. The exploratory data analyses showed a non-normal distribution of responses that severely altered the original design of the study. For example, although a t-test for significant differences was originally proposed to test mean scores of

metacognitive strategy use of expert and non-expert trainers, the non-normal distribution (coupled with small sample sizes) violated key assumptions underlying the t-test, and therefore had to be abandoned. The same was true for the analysis originally proposed to test the second research hypothesis - a multiple regression analysis. Again, the non-normal distribution and small sample size violated underlying assumptions of the multiple regression analysis and caused it to be abandoned in favor of a non-parametric statistic.

The exploratory data analyses were used to compile useful information about the characteristics of trainers generally, and expert trainers, in particular. This information helped to contextualize the results of subsequent data analyses.

#### Analysis of Research Question

The exploratory data analysis also provided information that was used to answer the research question of this study, namely, what information processing strategies do trainers generally report using during the preactive planning phase of training? Questionnaire responses were analyzed by computing the frequency of responses by strategy type (metacognitive, cognitive and social-affective), and by specific strategies within each categorical type (for example, within the group of strategies defined as "cognitive," computing the frequency of

response for rehearsing new material by repeating it in order to remember it, versus organizing new material by grouping it or classifying it in order to remember it). Since the questionnaire used a Likert-type scale which was constructed along descriptions of frequency (always, often, sometimes, rarely, never), the descriptions of frequency of use were easily transformed into numerical rankings of 1-5 (with 1 signifying always and 5 signifying never).

Means for frequency of use of each specific strategy type (metacognitive, cognitive and social-affective) were computed to develop a general picture of the information processing strategies used by trainers. In addition, means scores of reported frequency of use of each strategy type within the broad categories were computed. Next, a comparison of the mean scores of reported frequency of use of each strategy was conducted for familiar and unfamiliar settings. Finally, an analysis of the range of raw scores of reported frequency of use of each strategy category was conducted for experts and non-experts.

In addition to the quantitative analyses that were performed, the think aloud interviews conducted with the three training experts were examined for evidence of experts' general planning patterns. The unit of analysis was considered to be the process of thinking in the three individuals who

happened to be identified as experts in this study (others who are identified as experts may do other things or think differently in similar situations).

Each transcribed think aloud interview was examined for evidence of broad themes running through it by noting the appearance of planning processes that seemed to generally relate to the three broad categories of strategy use. Next, the broad categories that emerged were further examined to determine if there was evidence of use of a particular strategy type within the broad strategy category. In addition, the interviews were examined for planning sequences: that is, what activities the experts did first, and what activities followed. Finally, once the themes were identified and specific strategies were identified, specific examples of supporting evidence for these themes and strategy types were extracted.

The three think aloud interviews were then viewed together. Global themes that emerged in all three interviews were noted.

### Analysis of Research Hypothesis One

The first hypothesis of this study was tested by analyzing the data collected through the workshop planning questionnaire. First, the questionnaire respondents were

sorted into groups: those receiving no votes, those receiving one vote, two votes, three votes and four votes.

Next, the reported mean frequency of use of all metacognitive strategy items was computed for each of the groups. The group scores were compared for differences using a Kruskal Wallis one-way Analysis of Variance (ANOVA). The Kruskal Wallis one-way ANOVA is a non-parametric test used to determine whether three or more independent groups come from the same population (Huck, Cormier & Bounds, 1974). Although it might be argued that one cannot substitute an ANOVA for a multiple regression, Cohen (1968) has successfully shown evidence of a clear algebraic relationship that exists between multiple regression and analysis of variance.

The Kruskal Wallis one-way ANOVA does not require equal numbers of subjects in each group, nor does it require normality of the distributions. Because there were five groups of trainers and sample sizes greater than five, a  $\chi^2$  table of critical values with  $k - 1$  degrees of freedom ( $k$  being equal to the number of samples) was used.

#### Analysis of Research Hypothesis Two

The second hypothesis of this study, which stated that categorization as an expert can be predicted by a trainer's prior experience, was tested by examining the data collected

by the demographic survey. A Kruskal Wallis one-way ANOVA was also employed to test this hypothesis. As in Research Hypothesis One, because there were five groups of trainers and sample sizes greater than five, a  $\chi^2$  table of critical values with  $k - 1$  degrees of freedom ( $k$  being equal to the number of samples) was used.

#### Limitations of the Study

The process by which experts were identified is one that is somewhat problematic and has been discussed at length in this chapter. Although other studies of expertise have relied on nominations to help identify experts, the nominations were usually accompanied by some other measure of competence. This was not possible in the present study.

The small sample sizes and non-normal distributions of data posed severe problems in this study. Neither of the originally planned analyses could be used. Although the Kruskal Wallis one-way ANOVA proved an acceptable substitute for testing the hypotheses put forth in the study, no statistic can make up for inherently bad data. Therefore, any conclusions drawn from the quantitative portions of this study must be viewed with a healthy dose of skepticism.

In addition, although the think aloud interviews with the three training experts accurately depict the reported planning

strategies of the three experts in this study, it should be noted that other experts may perform differently. This portion of the study should be viewed as exploratory, intended to further the understanding of how a specific group of training experts plan. The results cannot be used to predict or generalize across the field of training experts.

### Conclusion

This chapter has provided an overview of the research design and analyses used in conducting the present study. A description of subjects, procedures and data collection instruments and techniques were provided. Finally, some limitations of the data collection and analyses were discussed. Chapter Four presents the analysis of the data.

CHAPTER FOUR  
DATA ANALYSIS

Introduction

The results of the data analysis are discussed in this chapter. The study examined one research question and two research hypotheses. The research question explored by the study is:

What information processing strategies do trainers generally report using during the preactive planning phase of training?

The research hypotheses which were tested are:

H<sub>A1</sub>: Expert trainers will use in a significantly different proportion of metacognitive strategies than non-expert trainers in the preactive planning phase of training;

H<sub>A2</sub>: The categorization of trainers as "experts" can be predicted by variables such as prior teaching experience, prior training experience and prior coursework or study of teaching and/or training.

The chapter will provide an overview of the general procedures used to analyze the quantitative data in the study, set forth the results of the exploratory data analysis of the major variables of the study, and provide the results of the tests performed to answer the research question and research



hypotheses of the study. The chapter will also provide three case studies of expert planning. Finally, the chapter will offer a discussion of the results of the both the quantitative and qualitative findings of the study.

### General Analysis Procedures

The data analysis proceeded by examining the returned questionnaires for the names of those trainers who had been named as the best trainer in each center. These votes were considered to be nominations for expert. Next, descriptive demographic information and other qualitative data which was provided in narrative format by the trainers (e.g., the names of teaching methodology courses, descriptions of courses in training) was analyzed, categorized and coded. All quantitative data were entered into an SPSS-PC software program and analyzed. Descriptive data analysis was conducted on all of these data. Finally, the additional narrative responses provided by trainers to the "other" strategy category at the end of each training scenario were examined and analyzed.

### Results of the Exploratory Data Analysis

What follows are the results of the descriptive analyses performed on the major variables of this study: the votes for

expert, trainers' previous experience in teaching, and trainers' previous experience in training. This information is provided to give a more complete picture of the trainers who participated in the study.

#### Analysis of Votes for Experts

Of the 78 (22 male and 56 female) subjects who returned the questionnaire, 41 (53%) received no votes as an expert, 22 (28%) received one vote, 9 (11%) received 2 votes, 3 (4%) received 3 votes, and 3 others (4%) received four votes. In some cases trainers voted for more than one person, citing a particular topic or audience that the trainer handled particularly well. Whenever a trainer nominated more than one person, each person who was nominated received a vote. In other cases trainers stated that they really couldn't say who the best trainer in the center was, and therefore, did not wish to name anyone. In many instances these trainers went on to explain that they refrained from answering because they had not had an opportunity to see every trainer in their center train.

Because there seemed to be a decided trend in the way the votes were split, all trainers who received three or more votes were considered to be experts for purposes of this

study, yielding six experts. All six of the experts were female.

In addition to being asked to name the best trainer in their center, subjects were also asked to describe the skills that the nominated trainer possessed or exhibited which led to their nomination. This question was included in order to provide a window on the nomination process; an opportunity to see the factors that trainers consider when they think of an "expert" trainer. The responses fell into three broad categories: content knowledge, social-affective skills (such as the ability to relate well to workshop participants), and planning/organizational abilities. When describing the experts, trainers usually listed skills that fell into two or more of the broad categories. In other words, training experts were considered to be experts not solely because of their superior knowledge of content, but because, in addition to this content knowledge, the experts also knew how to work effectively with workshop participants and knew how to plan and organize a workshop.

#### Trainers' Previous Teaching Experience

Ninety-seven percent of the subjects indicated that they taught previously. In many cases, the trainers taught at several different levels (e.g., elementary, middle school,

secondary and college/adult levels) during their careers. Of the subjects who responded that they taught previously, 57% taught at the K-3 level, 49% taught at the 4-5 level, 57% taught at the 6-8 level, 56% taught at the 9-12 level, and 82% taught at the college or adult level. In addition, when asked whether they had taken some type of coursework related to instructional methodology, 90% of all trainers indicated that they had taken some type of teaching methodology course. (These percentages do not add to 100% because some subjects have taught at a number of grade levels).

An exploratory analysis of the previous teaching experience of those trainers who had been identified as experts revealed some differences between the experts and the general population of trainers. For example, all six experts taught at both the K-3 and 4-5 grade levels. Only one of the experts taught at the 6-8 level, and only one taught at the 9-12 level. Five of the six experts had also taught at the college/adult level. In addition, all of the experts had taken coursework in elementary teaching methodology, and two had also taken coursework in secondary teaching methodology.

#### Previous Training Experience

Trainers' reported previous experience in giving workshops prior to joining the staff of the training center

was slightly different from their previous experience with teaching. Approximately 88% of all subjects had given workshops or done any teacher training prior to becoming trainers. A much lower percentage of the subjects (47%), said that they had taken a formal course or workshop on how to train or deliver workshops. However, this figure is somewhat deceptive, in that trainers reporting previous education or coursework on training may have received a smattering of information on training, rather than a systematized whole program of instruction on training. In fact, when the specific type of formal coursework or workshops that the trainers received is viewed with regard to the type of content that was taught, the picture of prior formal coursework on training changes.

The subjects' narrative responses to this question were sorted into four more specific content categories: principles or theories of adult learning, logistics (such as how to make effective overhead transparencies or handouts), methodology (including how to structure learning activities or increase participant involvement) and needs assessment/planning and evaluation. When examined along these content categories, only 13% of the trainers reported formal training or coursework in principles or theories of adult learning, 12% reported formal training in the logistics category, 34% in the methods

category and 17% in the needs assessment, planning and evaluation category.

When similar exploratory analyses were performed on the group of experts alone, a picture similar to that of the general population of trainers emerges. All six experts reported that they had given workshops prior to joining the staff of the training center at which they were currently working and 50% of the experts said that they had taken some type of workshop or coursework on how to train. Only one of the experts had received formal training on the principles of adult learning, one had some experience with training logistics, two had training on methods of training and one had training in needs assessment, planning and evaluation.

#### How Trainers Say They Learned to Train

One of the items on the questionnaire asked trainers to describe the types of activities or experiences that had helped them most in learning how to train. Not surprisingly, virtually all of the trainers mentioned their own training experience. Reminiscent of the story of the violinist who asked the cab driver how to get to Carnegie hall, one trainer replied, "Practice, practice, practice." However, almost all of the trainers also reported that observing other trainers was a key factor in learning how to train. Collaboration with

other training colleagues was a frequently mentioned response, as well. Collaboration took several forms: co-planning or co-presenting workshops, discussing training, and participating in colleagues' workshops.

Some less frequently mentioned activities or experiences included knowledge of content, reading about training, classroom teaching experience, and self-reflection. Self-reflection included such items as "reflecting on my own training strategies," "I draw deeply from within - from my inner teacher," and "hands-on, mind-on activities."

The responses of the expert trainers to this question were similar to the responses of the general population of trainers. Interestingly enough, none of the experts mentioned self-reflection.

#### Trainers' Reported Strategy Use

Because so little information is known about how trainers prepare for workshops, the research question to be explored by this study focused on the information processing strategies that trainers generally use as they plan. It was, therefore, important to look at the responses to the questionnaire items related to the training scenarios in order to determine the general planning practices of trainers as a group. For this part of the data analysis the responses provided by both

experts and non-experts were combined to give a more general picture of what trainers generally do when planning for workshops.

The strategies which appeared on the questionnaire derived from three major categories: metacognitive, cognitive and social-affective. Each major category was made up of several smaller subcategories. For example, the metacognitive strategy category had three subcategories: planning (or the top-down process that capitalizes on known information), selective attention and evaluation; the cognitive category contained six subcategories: resourcing, elaboration, inferencing, rehearsal, imagery and transfer; the social-affective category contained the subcategories of cooperation, self-talk and questioning. By examining how frequently trainers indicated that they used each strategy, a general picture of strategy use was obtained. Mean average frequency of use was computed for each major strategy category and subcategory (with 1 equal to never, and 5 equal to always).

All of the trainers reported using a combination of strategies when planning for workshops. These strategies spanned the three major categories of metacognitive, cognitive and social-affective. The reported frequency of strategy use across the major categories was fairly consistent (e.g., the average frequency of reported use of metacognitive strategies



was 4.35; use of cognitive strategies was 4.15; use of social-affective strategies was 3.89).

Although reported strategy use also appeared to be consistent within the metacognitive and social affective categories, there appeared to be slightly more variation in reported strategy use within the subcategories of the cognitive group. Again, the cognitive category consisted of six subcategories of strategy type (resourcing, elaboration, inferencing, rehearsal, imagery and transfer). The most frequently used cognitive strategies were elaboration strategies (average = 4.54); the least frequently used cognitive strategies were rehearsal strategies (average = 3.19).

Table 1 (see page 96) shows the major categories and subcategories of strategies which were included on the questionnaire; numbers showing the items on the questionnaire which relate to each strategy subcategory appear in parentheses. Table 1 also presents a summary of the average frequency of use for each strategy category and subcategory, the mean score for all items in a particular category, the standard deviation, and the minimum and maximum scores obtained. Numbers have been rounded to two decimal places. Initial comparisons of the strategy use of experts and non-experts were begun at this point by computing and examining

Table 1

## Trainers' Reported Strategy Use by Major and Subcategories

| <u>Strategy</u>                                      | <u>Average</u><br>(1 = never;<br>5 = always) | <u>Mean</u>  | <u>SD</u>   | <u>Minimum</u><br><u>Raw</u><br><u>Score</u> | <u>Maximum</u><br><u>Raw</u><br><u>Score</u> |
|--|--|--------------|-------------|--|--|
| <b>METACOGNITIVE (all subcategories combined)</b>    | <b>4.35</b>                                  | <b>56.9</b>  | <b>5.32</b> | <b>21</b>                                    | <b>65</b>                                    |
| Planning (Items 1, 5, 15, 19)                        | 4.38   | 17.51        | 2.79        | 6  | 20   |
| Selective Attention (Items 3, 17, 49, 50, 52)        | 4.56   | 22.80        | 1.85        | 15   | 25   |
| Evaluation (Items 12, 26, 31, 41)                    | 4.12   | 16.49        | 2.88        | 4  | 20   |
| <b>COGNITIVE (all subcategories combined)</b>        | <b>4.15</b>                                  | <b>89.33</b> | <b>9.02</b> | <b>61</b>                                    | <b>110</b>                                   |
| Resourcing (Items 2, 6)                              | 4.28   | 8.56         | 1.32        | 5  | 10   |
| Elaboration (Items 6, 7, 20, 21)                     | 4.54   | 18.17        | 2.02        | 13   | 20   |
| Inferencing (Items 8, 22, 34, 44, 53)                | 4.36   | 21.81        | 1.83        | 17   | 25   |
| Rehearsal (Items 9, 10, 23, 24, 37, 47)              | 3.19   | 19.14        | 5.99        | 6  | 30   |
| Imagery (Items 11, 25)                               | 4.14   | 8.28         | 1.93        | 2  | 10   |
| Transfer (Items 32, 42, 51)                          | 4.46   | 13.37        | 1.37        | 10   | 15   |
| <b>SOCIAL-AFFECTIVE (all subcategories combined)</b> | <b>3.89</b>                                  | <b>58.35</b> | <b>7.71</b> | <b>28</b>                                    | <b>75</b>                                    |
| Cooperation (Items 4, 18, 35, 45, 54)                | 3.65   | 18.21        | 3.00        | 11   | 25   |
| Self-Talk (Items 13, 27, 36, 46)                     | 3.99   | 15.96        | 3.57        | 4  | 20   |
| Questioning (Items 29, 30, 33, 39, 40, 43)           | 4.03   | 24.18        | 3.75        | 14   | 30   |

strategy use scores in each of the three major strategy categories. The range of scores (raw minimum and maximum scores) achieved by experts and non-experts on metacognitive, cognitive and social affective strategies appears in Table 2 (see page 98). Table 2 shows that the range of strategy use was more consistent for experts than non-experts, with experts achieving appreciably higher minimum scores than non-experts, and somewhat lower maximum scores than non-experts. The greatest difference between experts and non-experts was observed in the minimum raw scores for metacognitive strategy use, with experts showing minimum raw scores almost 62% higher than non-experts.

In order to illustrate these differences in a more graphic fashion, Figures 1, 2, and 3 provide a visual representation of the raw scores for experts and non-experts. Figure 1 (see page 99) shows the raw scores of expert and non-expert trainers for all metacognitive strategy items combined. Figure 2 (see page 100) shows the raw scores for experts and non-experts for all cognitive strategy items combined, and Figure 3 (see page 101) shows the raw scores for all social affective strategy items combined.

Table 2

Range of Raw Grand Scores for Experts and Non-Experts in  
Each Major Strategy Category

|             | Metacognitive<br>Strategies<br>(Maximum<br>Possible<br>Score = 65) | Cognitive<br>Strategies<br>(Maximum<br>Possible<br>Score = 110) | Social-<br>Affective<br>Strategies<br>(Maximum<br>Possible<br>Score = 75) |
|-------------|--|---|---|
| Experts     | 55-62  | 77-99   | 43-65   |
| Non-Experts | 34-65  | 68-110  | 29-75   |

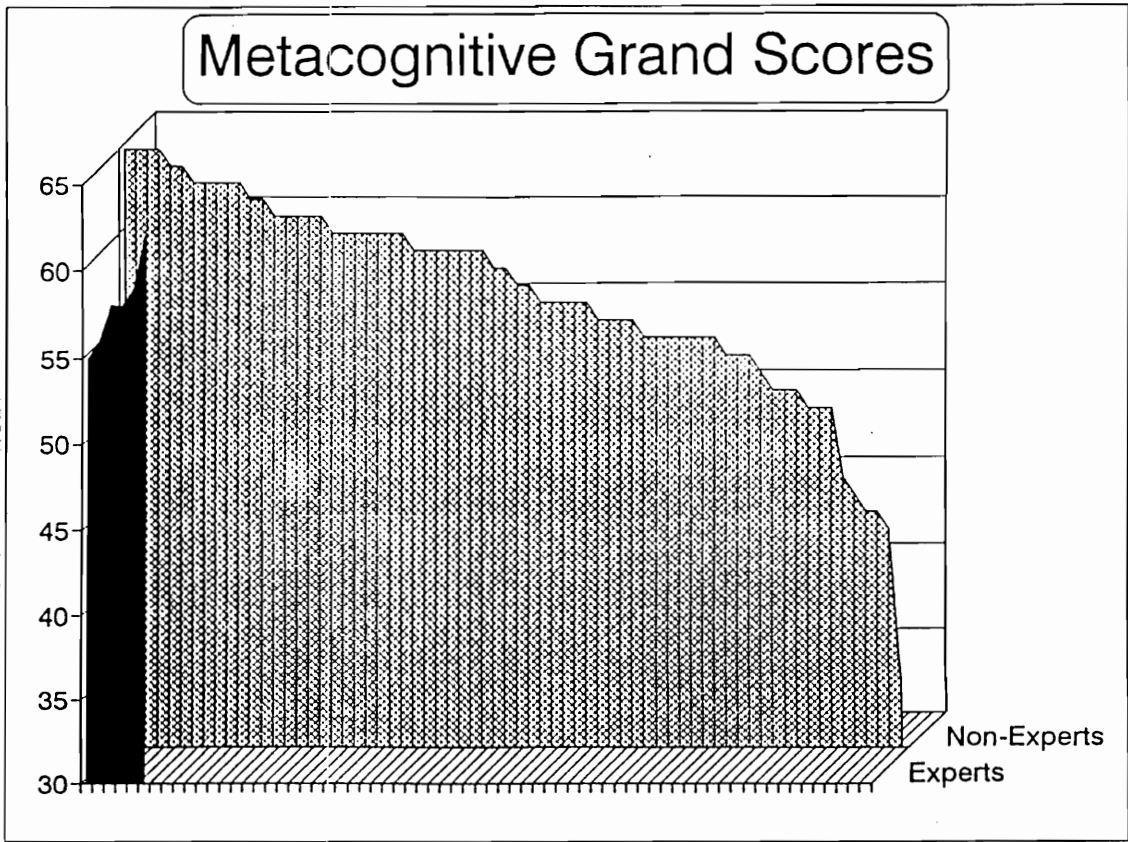


Figure 1

Comparison of Experts' and Non-Experts' Raw Scores for Reported Metacognitive Strategy Use

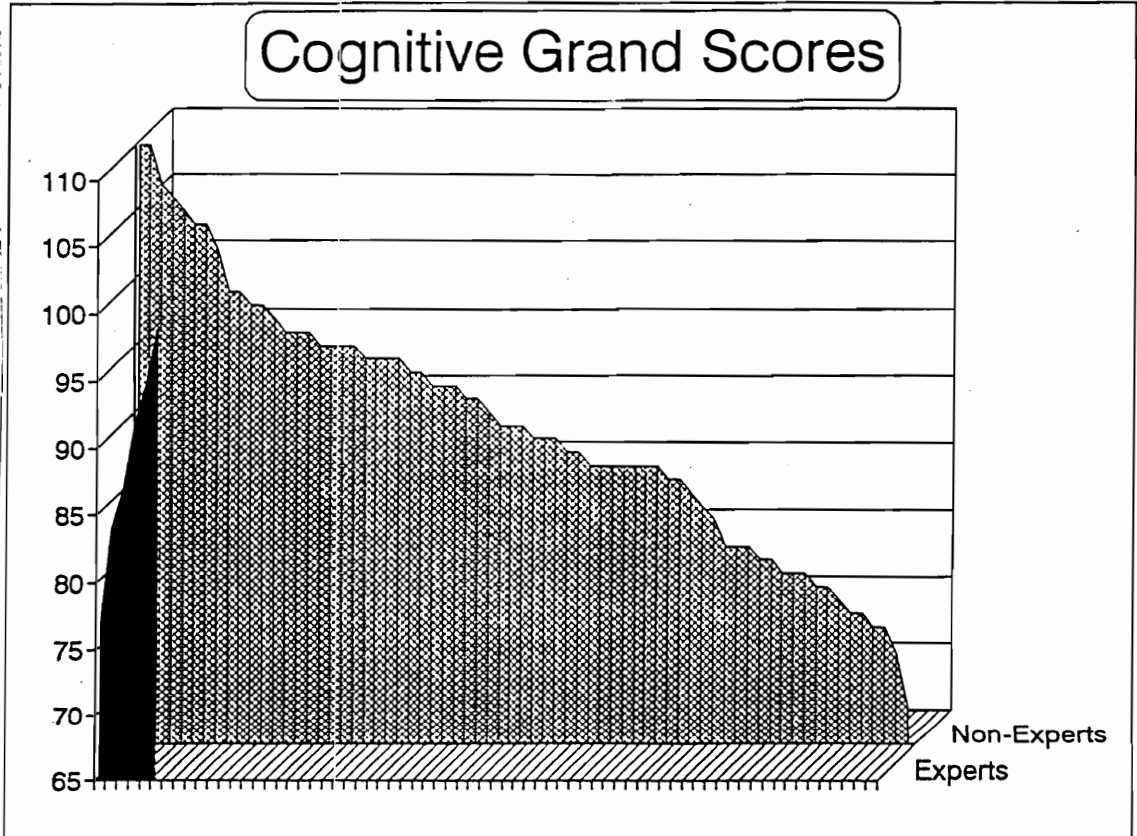


Figure 2

Comparison of Experts' and Non-Experts' Raw Scores for Reported Cognitive Strategy Use

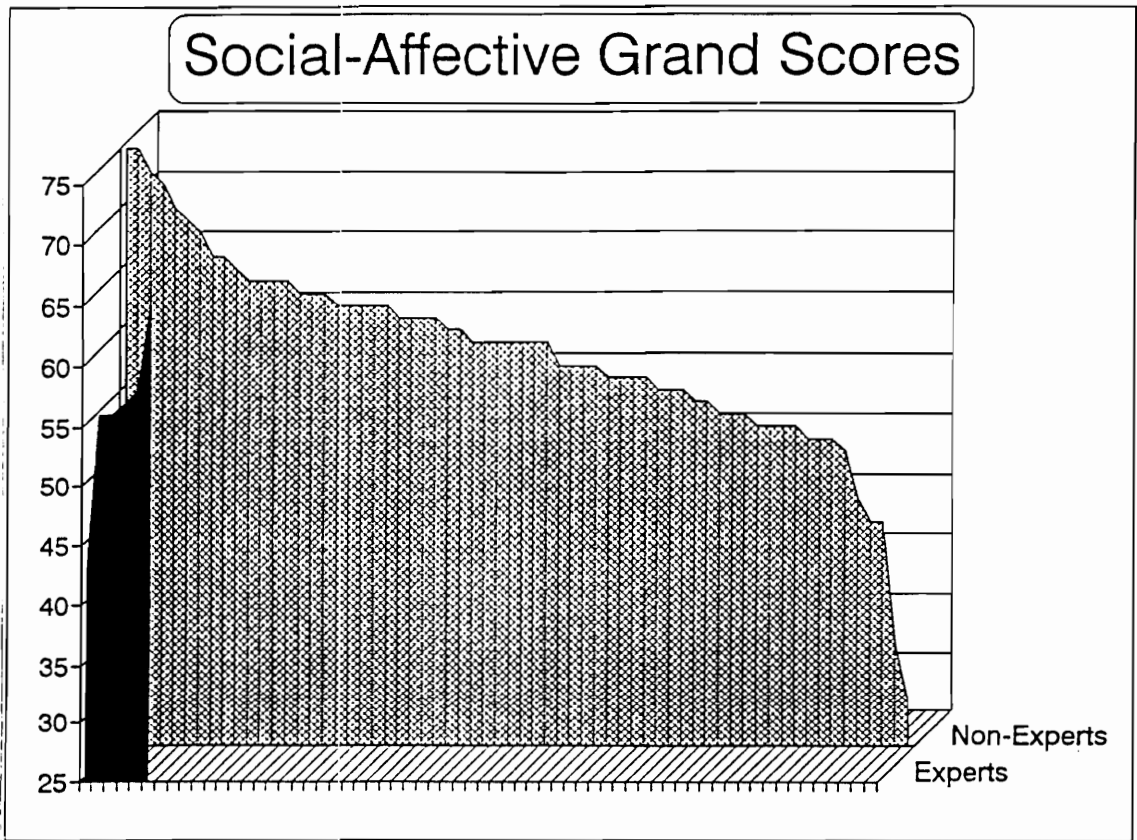


Figure 3

Comparison of Experts' and Non-Experts' Raw Scores for Reported Social-Affective Strategy Use

### Strategy Use in Context

The way in which trainers used the strategies within the context of the training scenarios was also examined. Because the training scenarios varied with regard to trainers' familiarity with the topic of the workshop and trainers' familiarity with the audience for whom training was being designed, it was possible to examine the frequency of reported use of each type of strategy in both familiar and unfamiliar settings. This construct was important to examine in view of accounts of routinization of certain behaviors reported in the literature on expertise.

For example, the first training scenario involved preparing for a workshop on a new topic, one which was unfamiliar to the trainers. The second scenario involved planning for a workshop on a topic which was familiar to the trainers, one on which they had presented previously. In the third and fourth training scenarios, familiarity with the topic of the workshop was held constant and familiarity with the audience was varied. By juxtaposing the trainers' responses to scenarios one and two, and three and four, it was possible to see if the variable of familiarity affected the trainers' strategy use.

Tables 3 and 4 show how trainers report using each of the strategies in familiar and unfamiliar contexts. Table 3 (pages



104-105) provides the mean and standard deviation scores for each strategy in the workshop topic training scenarios. Table 4 (pages 106-107) presents the mean and standard deviation scores for each strategy in the audience scenarios.

An examination of Tables 3 and 4 shows that when preparing for workshops, regardless of whether the topics are familiar or unfamiliar, trainers use a wide variety of strategies and use them in a very consistent way. This fact is also mirrored in the comments that trainers make when they indicate other strategies that they use. In fact, one trainer who responded to the unfamiliar/familiar workshop topic scenarios stated, "Quality requires the same process - information and knowledge become dated quickly." Another trainer, responding to the unfamiliar/familiar audience scenarios, stated, "I feel a needs assessment is crucial, no matter who the audience is and how many times I've presented to a group." A third trainer, also responding to the unfamiliar/familiar audience scenarios, might have provided a possible explanation as to why these trainers are so consistent in their planning processes when stating, "...familiar...is comfortable on the one hand, but quite challenging on the other hand, as I want to be sure that I provide activities and insights that are new, fresh and exciting."

Table 3  
 Trainers' Reported Strategies When Preparing for  
 Unfamiliar/Familiar Workshop Topics

| <u>Unfamiliar</u><br>M | <u>SD</u> | <u>Familiar</u><br>M | <u>SD</u> | <u>Strategy</u>  |
|------------------------|-----------|----------------------|-----------|--|
| 4.49                   | .94       | 4.22                 | 1.09      | I develop a plan which guides my preparation.  |
| 4.54                   | .66       | 4.03                 | .85       | I read as much as I can about the topic.   |
| 4.45                   | .62       | 3.97                 | .82       | I scan a lot of material on the topic, selecting a few things which I want to go back and read.  |
| 4.31                   | .73       | 3.51                 | .88       | I talk to other people who know about the topic to get a sense of direction of the things I should be including in the presentation.                   |
| 4.42                   | .85       | 4.38                 | .81       | I set some tentative objectives for the workshop and try to relate the material I'm reading to the objectives I've set.                                |
| 4.49                   | .73       | 4.58                 | .63       | As I begin preparing the workshop, I try to relate it other topics I already know; other workshops I've already prepared and given.                    |
| 4.44                   | .73       | 4.67                 | .53       | While I'm exploring the content of the topic, I try to relate it to learning activities I've used previously that could also be used in this workshop. |

Table 3 (cont'd.)

| <u>Unfamiliar</u><br>M | <u>SD</u> | <u>Familiar</u><br>M | <u>SD</u> | <u>Strategy</u>   |
|------------------------|-----------|----------------------|-----------|---|
| 4.75                   | .52       | 4.71                 | .56       | I try think of activities for participants to do which will help reinforce the content I'm presenting.  |
| 3.42                   | 1.20      | 3.03                 | 1.24      | I script out what I'm going to say and do.  |
| 3.37                   | 1.15      | 3.03                 | 1.10      | I rehearse what I'm going to say and do.  |
| 4.22                   | 1.00      | 4.06                 | 1.02      | I try to imagine the workshop in my mind, reviewing the content I'll be presenting and the activities I've designed for the participants to do.   |
| 4.50                   | .79       | 4.45                 | .80       | Once I've decided on the content and activities for the workshop, I examine the amount of time I'll have and re-adjust the content and activities, adding and deleting material as necessary. |
| 4.15                   | 1.04      | 4.21                 | 1.00      | I reassure myself that the workshop I'm planning will be successful.  |

Table 4

Trainers' Reported Strategies When Preparing for Unfamiliar/Familiar Audiences

| <u>Unfamiliar</u><br>M | <u>SD</u> | <u>Familiar</u><br>M | <u>SD</u> | <u>Strategy</u>   |
|------------------------|-----------|----------------------|-----------|---|
| 4.81                   | .54       | 4.62                 | .84       | I talk to the person who has requested the workshop to find out as much as I can about the needs and background of the audience before I start putting the workshop together. |
| 4.23                   | .88       | 3.79                 | 1.04      | I talk to colleagues who have given workshops to this audience <u>before</u> I start planning.  |
| 3.95                   | .97       | 3.58                 | 1.10      | After I've made a tentative plan, I talk to colleagues who have given workshops to this audience to see whether or not I'm on track.  |
| 4.44                   | .72       | 4.69                 | .57       | I think about my previous experience(s) with this audience and use that to guide my planning.   |
| 3.36                   | 1.07      | 3.35                 | 1.13      | I try to conduct a needs assessment with selected members of the audience prior to planning the workshop.   |
| 3.72                   | .72       | 3.97                 | .58       | Since I generally have a pretty good feel for the audience's needs, I can infer what activities will work.  |

Table 4 (cont'd.)

| <u>Unfamiliar</u><br>M | <u>Familiar</u><br>M | <u>SD</u> | <u>Strategy</u>  |
|------------------------|----------------------|-----------|--|
| 3.08                   | 3.14                 | 1.02      | I plan out several potential workshop activities that relate to potential needs that the audience may have. When I begin the workshop, I explain these alternatives and let the audience decide which pieces will best meet their needs. |
| 3.80                   | 3.88                 | 1.06      | I reassure myself that I have usually been pretty successful in designing workshops for groups in the past; this time should be no different.  |
| 3.29                   | 3.03                 | 1.25      | I script out what I'm going to say.  |

Although the first two pairs of training scenarios varied according to degree of familiarity with workshop topic and audience, there was a final workshop scenario included in the questionnaire that was not varied with regard to familiarity. This training scenario described a situation in which trainers were told that they had just finished giving a workshop. They were told that some parts of the workshop had gone as expected, other parts had not. Trainers were also told that they were scheduled to present this same workshop for another group in two weeks. The purpose of this training scenario was to explore the post-training reflections of trainers.

An overwhelming proportion of trainers (88%) said that they always thought about parts of the workshop that didn't go well. An almost equally high percentage (86%) said that they always thought about parts of the workshop that went well. Interestingly, only 50% of the trainers said that they always used the evaluations of the workshop to determine which activities to use again. The responses of the expert trainers were similar to the responses of the trainers generally.

#### Other General Analysis of the Questionnaire Responses

Because the trainers were provided an opportunity to describe other strategies that they used when planning workshops in a section of the questionnaire that appeared

immediately after each training scenario, there was a substantial amount of additional qualitative data that was also analyzed. In fact, almost half (47%) of the trainers took the opportunity to add strategies in this section. The trainers' narrative responses were examined to determine whether they conformed to the strategy categories and subcategories established previously by the researcher. Upon examination, however, almost all of the additional strategies trainers reported using were found to conform to the previously established strategy categories and subcategories. In most instances, the additional strategies mentioned by the trainers helped to clarify or amplify the strategies already listed in a given training scenario. For example, in the scenario dealing with preparing a workshop on a new topic, one of the strategies was, "I set some tentative objectives for the workshop and try to relate the material I'm reading to the objectives I've set." One trainer added this strategy: "I always set the objectives first, then read and plan from there." In the same scenario, another of the strategies was "I rehearse what I'm going to do and say." Another trainer said, "I don't exactly rehearse, but I say key phrases out loud while going over the workshop."

Some of the trainers' additional comments, however, seemed to serve a different purpose than adding strategies or clarifying strategy use. Two important examples come to mind.

The first example relates to trainers' use of the "other" category to show how important training is to them. In the fifth and final training scenario (which dealt with reflecting on one's performance after having given a workshop), one trainer added,

"I try to use a different approach - if the content seemed to be the problem, I try to present that differently. If the process was problematic, I keep the content intact, but change the process. If both went badly, I get depressed."

Another trainer, responding to the same scenario said,

"I spend a lot of time 'debriefing' myself - in the car on the way home, before I go to sleep... sometimes I obsess too much over things I feel went badly--usually little things."

The second example of trainers using the "other" category for purposes other than adding or clarifying strategies relates to trainers showing that they are reflecting on the planning process. One trainer, who was responding to a scenario which included the strategies of scripting and rehearsing said, "I'd probably be more successful if I did script and rehearse."



Summary of the Findings on Trainers' Characteristics, Descriptions of Expert Trainers and Reported Strategy Use

The teacher trainers in this study come to the training field with considerable experience in teaching. This experience comes from having taught at a variety of levels and from having taken formal coursework in education. Trainers do not have comparable experience in training. Although most have trained or given workshops prior to stepping into training positions, few of the trainers have had extensive formal coursework or workshops dealing with training.

Trainers seem to have firm ideas about what constitutes a training expert. Their responses indicate that superior content knowledge, social-affective skills and planning/organizational abilities are characteristics that expert trainers exhibit. Perhaps even more important, trainers indicate that it is a combination of these skills and abilities which denoted experts, rather than strength in just one of them.

Trainers report that a variety of activities and experiences have helped them learn to train. Chief among these are their own training experiences and watching others train. However, collaboration with other trainers in the form of co-planned and co-presented workshops, discussions of training,

and being participants in colleagues' workshops were also reported as valuable activities.

The trainers report using a variety of strategies when they plan workshops. These strategies cut across three major categories: metacognitive, cognitive and social-affective strategies. Strategy use appears to be fairly consistent across the three categories. Within the metacognitive and social affective categories strategy use was also consistent. However, within the category of cognitive strategies, rehearsal strategies were used less frequently than other cognitive strategies.

Strategy use also appears to be consistent in unfamiliar or familiar contexts. Trainers' use of strategies in planning also extend to post-workshop reflections. Most trainers report that after giving a workshop they think about the things that went well and the things that did not go so well as part of planning for future workshops. Only about half of the trainers indicate that they use participants' written evaluations of a workshop as a yardstick for deciding which activities to include in future workshops.

#### Metacognitive Strategy Use by Expert and Non-Expert Trainers

The first research hypothesis to be tested by this study was that expert trainers use a significantly different

proportion of metacognitive strategies than non-expert trainers in the preactive planning phase of training. The first step in testing the hypothesis was to divide the subjects into groups according to the number of expert votes received (no votes, one vote, two votes, three votes and four votes). The next step was to extract the trainers' scores on all questionnaire items that had been previously classified as metacognitive strategies.

Originally, a t-test had been proposed to test for differences in strategy use between groups of experts and non-experts. However, due to the small sample size in two of the groups (those trainers who received three and four votes), and the non-normal distribution of the data uncovered by the descriptive data analysis, a non-parametric procedure was chosen to test the hypothesis. A Kruskal-Wallis one way analysis of variance (ANOVA) was employed. The results showed no significant differences in the way the various groups of trainers used the metacognitive strategies ( $\chi^2 = .66$ ,  $df = 4$ ,  $p = .96$ ).

#### Factors Relating to Trainers' Expertise

The second hypothesis of this study was that the categorization of trainers as "experts" can be predicted by

variables such as prior teaching experience, prior training experience and prior coursework or study of teaching and/or training. Again, the trainers were divided into groups according to number of votes received. Because each of the variables contained several levels or subcategories, each was tested separately. For example, in the first analysis, classroom teaching experience was divided into five categories of K-3, 4-5, 6-8, 9-12 and college/adult teaching.

While a regression equation was originally proposed to test this hypothesis, the non-normal distribution and small sample size of two of the groups precluded the use of this statistic. Once again, the Kruskal-Wallis analysis of variance was employed as the test statistic. Table 5 (see page 115) shows the result of the Kruskal-Wallis ANOVA performed on the variable of teaching experience. Only one of the subsets of the teaching experience variable, classroom teaching experience at grades 4-5, was significant ( $\chi^2 = 10.14$ ,  $df = 4$ ,  $p = .04$ ).

Tables 6 and 7 present the results of the subsequent analyses that were conducted on the variables of teaching methodology coursework and training methodology coursework/workshops. Table 6 (see page 116) shows teaching methodology coursework divided into four categories of elementary methodology, secondary methodology, adult

Table 5

Kruskal-Wallis  $x^2$  Values Between Five Groups on Teaching Experience

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| <u>Category</u> | <u>K-3</u> | <u>4-5</u>         | <u>6-8</u> | <u>9-12</u> | <u>C/A</u> |
|-----------------|------------|--------------------|------------|-------------|------------|
| Between Groups  | 3.65       | 10.14 <sup>a</sup> | 7.70       | 3.84        | 4.99       |

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<sup>a</sup> Value required for significance at the .05 level,  $df = 4$ , is 9.49.

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Table 6

Kruskal-Wallis  $\chi^2$  Values Between Five Groups on Teaching  
Methodology Coursework

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| <u>Category</u>   | <u>Elementary</u> | <u>Secondary</u> | <u>Adult</u> | <u>Unspecified</u> |
|-------------------|-------------------|------------------|--------------|--------------------|
| Between<br>Groups | 6.19              | 4.95             | 6.22         | 7.43               |

Value required for significance at the .05 level,  $df = 4$ , is  
9.49.

---

methodology and an unspecified methodology group which captured responses which could not be categorized into one of the preceding groups. Table 7 (see page 118) shows the training methodology variable broken into four categories as well: principles of adult learning, logistics methods of teaching adults, and needs assessment, planning and evaluation of adult learning. Neither the analysis performed on teaching methodology and nor the analysis performed on training methodology showed any significant effects.

Summary of Findings on Trainers' Use of Metacognitive Strategies and Factors Relating to Trainer Expertise

The expert trainers in this study, regardless of their classification as expert or non-expert, appear to use metacognitive strategies in the preactive planning phase of training in similar proportions to non-expert trainers. Previous coursework on teaching methodology, previous coursework or workshops on training methodology and most previous classroom teaching experience is not significantly related to trainers' classification as experts. The only factor that appears to relate to trainers being classified as ~~training~~ training experts is teaching experience at grades 4-5.

Table 7

Kruskal-Wallis  $\chi^2$  Scores Between Five Groups on Training  
Methodology Coursework/Workshops

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| <u>Category</u>   | <u>Principles</u> | <u>Logistics</u> | <u>Methods</u> | <u>Needs Assessment,<br/>Evaluation,<br/>Planning</u> |
|-------------------|-------------------|------------------|----------------|---|
| Between<br>Groups | 5.10              | 3.56             | 5.46           | 1.43  |

Value required for significance at the .05 level,  $df = 4$ , is  
9.49.

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### Discussion of the Findings

That fact that experts and non-experts in this study behaved similarly with regard to metacognitive strategy use and appeared to be similar in terms of previous experience does, at first, seem surprising. However, several factors may explain this result.

The first factor has to do with the fact that all of the trainers in the study are employed as training professionals. None of the trainers is, in the traditional sense, a non-expert. If any of the trainers had been non-experts, there is a great possibility that they would not have held their current positions. This factor is a critical one to remember, and may help account for many of the similarities found between the experts and non-experts in this study.

The second factor which may be related to the lack of difference found between experts and non-experts in this study relates to the data collection instrument that was used: the questionnaire. The questionnaire that was administered to all trainers was based on one that had been developed to examine learning strategies (O'Malley & Chamot, 1990). For purposes of this study, strategy items were first developed, and then classified into categories and sub-categories. Although the researcher was assisted in classifying the strategies by Anna Uhl Chamot, one of the developers of the original learning

strategy instrument, it is possible that the strategy categories and subcategories may not have provided a precise enough fit to the planning activities associated with training. And, although all strategies included in the questionnaire had been modified to reflect the circumstance of planning for training, and were based on previously conducted interviews and a previously developed instrument (O'Malley & Chamot, 1990), it could be that the strategies did not adequately represent the strategies that experts and non-experts use. In addition, the validity of using such a questionnaire to measure metacognitive strategies is a topic that may be discussed. In a preliminary study such as this, some may argue that qualitative techniques would be more appropriate than quantitative measures.

In addition, the section of the questionnaire that collected demographic information from the respondents appeared to have some flaws. For example, the subjects were asked to describe any previous coursework or workshops related to training or giving workshops. Although some did so in great detail, others provided only the sketchiest information. Because this data was categorized and subsequently analyzed quantitatively, it is hard to know if the information given by subjects was correctly interpreted in every instance.

The third and final factor that may help to account for the lack of difference between experts and non-experts concerns both the small numbers of trainers who emerged in the expert group, as well as the non-normal distribution of the sample. Upon conducting the exploratory data analysis, it became apparent that the analyses that had been planned originally (t-tests and a regression equation) would have to be scrapped. With numbers as small as 3 in each of the highest ranked groups of trainers and as great as 41 in the lowest ranked groups of trainers, comparisons between groups of experts and non-experts become particularly tricky.

Attempts to change the cut-off score for expert were also problematic. Although moving the cut-off score for expert down to 2 votes or even 1 vote would have resulted in groups of more equal size, this trade-off would have muddied the distinction between experts and non-experts even further.

Positively skewed responses on all but a few of the items on the questionnaire proved particularly resistant to efforts to achieve a more normal distribution through log conversions. Although the Kruskal-Wallis ANOVA appeared to be an acceptable substitute for the analyses that had been planned originally (and in fact, allowed the trainers to be viewed in five groups according to the number of expert votes received, rather than being lumped into only two - expert and non-expert), it

remains unclear whether a quantitative measure is truly capable of capturing and testing the distinctions that may exist between expert and non-expert trainers.

In fact, the finding that teaching experience at grades 4-5 is significantly related to trainer expertise is one that must be viewed with a great deal of skepticism. Because of the problems inherent in the questionnaire and the problems of sample size and non-normal distribution, it is impossible to know if this finding is, in fact, a real one or one which is due to the circumstance of chance. In addition, whenever a number of demographic variables, (such as the ones that were examined in this study) are tested, it is likely that at least one will prove significant. Further research, research that looks beyond teaching experience at a particular grade level (e.g., the skills developed by having taught in each grade, and the significance of teaching at various grade levels over time) is necessary before this finding can be considered stable.

#### How Expert Trainers Plan

Although originally conceived as way of amplifying the responses of experts on the quantitative portion of this study, the follow-up think aloud interviews that were conducted with three of the trainers named as experts seem to

offer the best avenue for exploring the preactive planning processes of expert trainers. The three interviews will, therefore, be presented here as individual case studies which have been analyzed using qualitative techniques. The case studies incorporate significant portions of the think aloud interviews in order to allow the experts' voices to emerge clearly.

#### Think Aloud Interview Procedures

The three expert trainers who received the highest number of votes (four) were contacted by phone and asked if they would be willing to participate in a follow-up think aloud telephone interview. All three agreed. The experts were asked to select a time when they would be planning for an upcoming workshop. On the designated day, each trainer was called and was given instructions for the think aloud. They were asked if they minded having the interviews taped. They were told that the purpose of the think aloud was to uncover their thinking processes related to planning. They were also told that the researcher might stop them in the middle of their planning and ask "What are you thinking about?" After these general procedures had been described, the experts were asked to begin the interview by providing the researcher with a brief description of the workshop they would be planning.

At some point during the interview, each subject was asked if the process they were describing represented the way they normally planned. This question was interjected to give the researcher an opportunity to discover if the planning processes talked about during the think aloud were, in any way, an artifact of the interview procedure itself.

The think alouds proved a challenging format for maintaining an objective research stance. All three experts knew the researcher previously and were aware that she had been a trainer. In fact, one of the experts tried to engage the researcher in a discussion of the upcoming workshop being planned. The dialogue of that exchange is shown here (edited comments appear in brackets):

Expert 1: ....That's probably the way I'll select the activity for this workshop. So does it sound to you that's it's going to.... Do you have any suggestions?

Researcher: No... and I shouldn't have any suggestions, because that's not what I'm here to do. (Laughs).

Ex. 1: But this is not a role play... (Laughs) this is what I really do [ask people for suggestions].

R: Well, I'd love to hear about how it goes after you give the workshop... maybe we could talk afterwards.... Let me put it back on you for a minute.

In all other instances, however, the researcher's comments during the think aloud interviews paraphrased what

the subject had just said in order to check for correct understanding and interpretation of a point the subject was making, or asked "What do you do next?" or asked for further clarification about what the subject was thinking.

#### Data Analysis Procedures

The think alouds were taped and transcribed (Complete interviews for all three experts appear in the Appendix). Minor editing to enhance comprehensibility took place as the interviews were transcribed. However, all editing has been clearly identified in brackets within the body of each interview. Pauses or breaks in speech have been indicated with a series of ellipses.

The unit of analysis was considered to be the process of thinking in the three individuals who happened to be identified as experts in this study (others who are identified as experts may do other things or think differently in similar situations). Each transcribed think aloud interview was examined for evidence of broad themes running through them by noting the appearance of planning process that seemed to generally relate to the three broad categories of strategy use. Next, the broad categories that emerged were further examined to determine if there was evidence of use of a particular strategy type within the broad strategy category.

In addition, the interviews were examined for planning sequences: that is, what activities the experts did first, and what activities followed. Finally, once the themes were identified and specific strategies were identified, specific examples of supporting evidence for these themes and strategy types were extracted.

### Case Study 1

Expert 1 taught at the elementary (K-3, 4-5), secondary (9-12) and college/adult level prior to becoming a teacher trainer. She also had extensive coursework in teaching methodology at both the elementary and secondary levels. She had taken courses or workshops on training which included information on cooperative activities, organization skill development and leadership skills. Expert 1 had also given twenty five workshops prior to joining the training center in which she was currently working.

Expert 1 chooses to describe an upcoming workshop that she was preparing for bilingual teacher aides. Almost immediately, it becomes apparent that although she is still in the process of planning, much planning has already taken place. This is the first theme that emerges from the case study: planning is a long term, on-going information gathering



process that weaves in and around and through the workshop being prepared.

Researcher: Tell me a little about the workshop you're going to be planning.

Expert 1: It's the first of a series of workshops that we're going to do with aides and the first of two sessions to be given over one week. The function of the workshop has changed as I've talked to the [project] director. Originally, it was going to be methods oriented, but because of some problems with some of the staff people... we (the Director and I) got into some elaborate conversations about what this group needed, and it's ended up that through our conversations we decided that it would be helpful to have this group talk about their job description...

Expert 1 goes on to show how the planning process has changed the original focus of the workshop.

Ex. 1: Yes. Initially, our conversations focused on "what can you do to these bilingual aides (she's a new project director)...but then we've been talking a lot over the last four months...and I guess it was probably initiated by me, how we could incorporate some of the problems she was having into the workshop.

Expert 1 continues on, talking about additional planning and preparation that she's done prior to today. She indicates that she's also talked over the workshop with a friend who had worked with these aides previously. But Expert 1 doesn't stop there. She explains:

Ex. 1: The initial pieces of the process are really important to me and they're probably most central to what I've

done, which is I have lots of conversations with the director, I've done two site visits, and I'm going to try to visit that morning, too, and make sure that I try to see most of the bilingual aides in the school [prior to the workshop]. I've talked with the principal of the school and everybody's given me wildly divergent information....

Wildly divergent information about audience needs, is perhaps, one of the most critical information gaps that teacher trainers face as they plan. Expert 1 shows how she has learned to deal with such wildly divergent information, incorporating it into the planning process.

Ex.1: ... what we're going to do is ask the aides to actually write down what they do, rather than relying on reports of the teachers, or the director....

But that's how I'm dealing with the ambiguity is to turn the ambiguity into the activity... because if there's that much ambiguity there, it seems like a problem to me. And all of those wildly divergent people have characterized this as a problem... I think five or six years ago, my orientation would have been to go "Oooh, I don't want to deal with that,"... now my orientation is well, we've got to deal with this.

Expert 1 indicates that the planning process often carries over into the workshop itself. She also indicates that the ability to "plan on one's feet" is a skill that she feels she has developed as a result of her experience in giving workshops.

Ex.1: I'm thinking about the possibilities for cooperative talk that could go on, I probably have three or four different activities in my mind that will take place, if appropriate, during the time, and I'm going to have all the "stuff" ready to do those things, but my style is usually to be very much an instant decisionmaker about what the sequence of things is going to be, depending on energy level of participants, level of talk that's going on, intermingling that's going on or not going on, academic orientation versus the personal orientation and which direction that needs to be going, so I like to have an array of things to choose from.

Expert 1 seems to feel comfortable in taking a lot of planning cues from what goes on while she is in the middle of delivering the actual workshop. She is comfortable in altering previously developed plans and speculates on the factors that allow her to be so flexible.

Ex. 1: I would feel very uncomfortable having a linear thing laid out from beginning to end... and that's probably sort of different from the way a lot of people like to do things....Because of experience, I can be much more "present" in what I'm doing, rather than being concerned about getting through material or some goal I may have had in mind. I feel like I'm a better listener and a better leader/participant, so that I can make better decisions now, as we're in process... I think that before I didn't trust myself to make decisions in process because I wasn't nearly as aware of what was going on. I'm much more aware of what **might** happen if we do X... I'm much better at making those decisions in process.

In addition to showing how the planning process carries over into the workshop itself, this section of the think aloud also shows the emergence of the second major theme of this case study: the effect of having learned valuable lessons from previous experience so that certain training behaviors become

routinized. In essence, Expert 1 is articulating that she knows she has the ability to plan in a different way due to the experience that has been gained and learned from; much of what she does in a workshop setting has now been routinized (like her repertoire of activities), so she is free to notice and use cues that she might not have been able to process or respond to previously. This sense of using cues comes through in other aspects of Expert 1's think aloud interview. For example, she mentions that when the fit between what the trainer has planned to deliver and the needs of participants doesn't mesh, "You can see that on people's faces." In another instance she says,

...it was clear to me immediately from their faces when I walked in that I needed to do a lot of talking about my experience as a high school English teacher right from the start. But I wouldn't have known that if I hadn't done a lot of workshops previously with high school people.

In fact, attention to social-affective cues such as the ability to respond and relate to participants is another major theme of Expert 1's interview. The social-affective aspect of training is clearly important to training expertise; it is one of the major descriptors that emerged when trainers were asked to describe the qualities of the best trainer in their centers during the expert nomination process.

However, what is apparent from talking to Expert 1 is that social-affective prowess is not something that just happens. Expert 1 recognizes its importance in the training process and, in fact, plans ways to show participants how she can relate to their needs, how she understands the contexts in which they work, and how she values them as competent professionals.

Ex. 1: The overriding thing that I've learned is the fact that there needs to be some type of recognition that they do really hard work and that they're not recognized for that work... one of the ways I can do that is by treating them in overtly professional ways.... making sure they have folders... and there's nice coffee and rolls... and we're not just in the kindergarten room where the chairs are little, because that's the only place to go - because if they were teachers they'd [the school would] find a spot. Those kind of symbolic things have been surprisingly important... There's a lot of PR work in what I do... and I really have changed in that way over six years of doing training. I see a major function of what I do is to say to people like bilingual aides, "I know you're serious about your work, that's why we're talking together about it, so here's a way of thinking about what you do." Before, I was more oriented to making sure that they understood a particular method... I still care a lot about that, but I know they won't even think about it [the method] unless some of the basic needs are met.... with adults, you just have to make sure that they feel valued and comforted and all those things.

Finally, Expert 1 talks about building trust and building credibility with participants as essential aspects of successful training. She demonstrates how she designs the planning process in such a way as to do precisely that:

Ex.1: ...last week I had a workshop and I was told the crowd was going to be hostile and I did this thing where I asked them for the names of participants before the workshop. I called them... and I talked to the principal, too and asked them what they wanted to talk about at the workshop, which probably saved my skin...

The fourth and final theme that emerges from the think aloud with Expert 1 is that she monitors and evaluates her planning against a mental picture of what the participants will take away from a workshop. She call this her "guiding principle." She has learned to concentrate on having participants walk away with the "big picture," realizing that her previous approach to planning was "probably unreasonable:" "I had this feeling... how no one would understand anything I was trying to say unless they understood it all, and unless I presented it all." Now, she says,

"I like to think about what people would say if they walked out of the workshop and someone asked them, 'Oh, what was that all about?' I actually like to think about what they would say... that's a guiding principle for me. I try and think about how the activities I ask them to participate in would turn into the statement they would make to answer that question."

#### Discussion of Case Study 1

From the think aloud interview with Expert 1 four strong themes emerge. First, planning is a process that takes place over a long period of time and often carries over into the workshop itself. This planning is, in effect, a search for

information that helps to better define the workshop context and needs of participants, rather than a process in which training content is acquired by the trainer or training materials are developed and assembled. Second, the routinization of certain training behaviors and certain training content has allowed Expert 1 to observe and listen for cues that she uses to modify previously developed plans. Third, this expert recognizes the importance of social-affective factors in the workshop/learning experience of participants. She consciously attends to these factors in her planning processes and incorporates them into her workshop delivery patterns. Finally, Expert 1 is constantly monitoring and evaluating her plans as they are being developed. She has a guiding principle that serves as a "mental map" of where she would like participants to be at the end of the workshop, and she develops workshop content and activities as landmarks that move her to her ultimate destination.

### Case Study 2

Expert 2 taught at grades K-3, 4-5 and the college/adult level prior to becoming a teacher trainer. In addition, she supervised student teachers, grades K-12. This expert indicated that she had taken and taught methodology courses at elementary, middle school and secondary levels. Expert 2 also

stated in the responses provided on her questionnaire that she had taken several courses or workshops related to training or giving workshops. This formal training included information on the content areas of needs assessment, logistics, methodology and principles of adult learning. Expert 2 indicated that she had given workshops over a period of five years prior to joining the staff of the training center at which she was currently employed.

During the think aloud interview Expert 2 chooses to talk about a workshop she is preparing for the following day. The workshop topic deals with setting up effective staff development programs. The format of the workshop is somewhat different than other workshops Expert 2 has given, in that her presentation is scheduled into an on-going program of workshops being put on by the school district. In addition, Expert 2 has learned that her workshop is just one part of an inservice day packed with other workshops and presentations; she discovers that she also the only trainer giving a workshop on that day who has not presented in the district previously.

Expert 2, like Expert 1, appears to plan over a period of time, drawing on many resources, both human and material. She says, however, that when she first heard about the workshop she was going to give, she realized that she only had about two weeks to plan. She also discovered that during one of the



weeks she had to prepare, she would be out of town. Nevertheless, she begins the planning process before she leaves by drawing on a bank of materials that she has accumulated from previously given workshops.

Ex. 2: I only had one day to think about and get it begun before I left...you know, handouts and overheads and that type of thing. Now that I'm back, I've picked them [the handouts and overheads] up, and I'll have go back and touch base and put on my thinking hat as to where I was at the point when I prepared the materials initially.

Expert 2 also indicates that she's talked with the district contact person to get additional information to help her in the planning process. She intends to use this information to modify and revise the tentative plans she's already made.

Ex. 2: ... when I started to plan I realized that they hadn't told me the number of participants, so I called the district contact person and as I talked with her, I told that I wanted to get some clarification on some things, and I shared with her a few of the options [for the workshop] to see if she had a preference. I took two pages of notes as she talked. I'll look at my notes, compare them to the packet I've already pulled together, and adjust from there.

Expert 2 has done some additional planning, as well. She says that she's talked with a consultant who's presented previously in the district.

Ex. 2: [I] asked her to look over my materials to see if there were some that were more relevant than others, based on her experience, particularly any that would tie in with what had been presented before, or where we ultimately want to take the group...[I asked her to] please tab them for me. The materials she marked will also be

incorporated as I make final selections of the material I'll use.... Now, what will finally determine the materials selected will be ... the amount of time that I have, and how to put it together.

Expert 2 also takes advantage of other opportunities to plan. In fact, she says, "I try to make workshop planning kind of a 'living process,' a part of whatever I'm doing." Expert 2 demonstrates this by talking about another person she happened to run into who had also worked previously with the district. She took the opportunity to ask his opinion of the workshop she was preparing saying, "I hadn't really planned to ask him about the workshop... it's just an automatic process to get input from others who have worked in similar contexts or related situations as I plan."

This expert, like Expert 1, realizes that she may be making additional modifications to whatever plan she finally develops once she meets and interacts with the workshop participants. She indicates that she intends to arrive at the district early, in order to sit in on other workshops prior to her own. She does this in order to continue her planning process by observing and listening to the participants.

Ex. 2: ... by listening to them, I'll get an idea of what they've done previously, what they've already accomplished or learned... The fact that we will break for lunch before my presentation will allow me to think about what I've heard in the morning and readjust things to make them more meaningful.

Expert 2's ability to make planning a "living process" is accompanied by her ability to monitor and evaluate her own planning. Like Expert 1, she appears to make adjustments to planning based on new information she receives. This self-monitoring is the second theme that emerges from the second case study. For example, in the second exchange described in this case study, Expert 2 talks about how (after talking to the district contact person and taking two pages of notes) she would "compare them to the packet she had already pulled together and adjust from there." Her reference to fact that breaking for lunch would allow her to think about what she had heard and "readjust things to make them more meaningful" is also a clear indication of how Expert 2 is using new information to evaluate her own planning. In addition, Expert 2 seems to build time into the planning process for this self-evaluation.

Ex. 2: Well, tonight, I'll probably put the whole thing together, and tomorrow as I'm driving there, I'm sure I'm going to be reflecting on the things I've selected to do and getting it very clear, so that by the time I'm listening to people talk, I will have done a lot more planning and refining.

One thing that appears to help Expert 2 in the self-evaluation process is the fact that she, like Expert 1, appears to have an extensive mental map of what training should look like prior to beginning her own planning. This is

the third theme that emerges from the think aloud interview with Expert 2. She consciously uses this mental map to visualize other workshops and other audiences with whom she has worked.

Ex. 2: ...so if I'm going to be talking to parents, I visualize the parents, and I visualize the things that have worked and the types of questions parents generally ask...For this group that I'm preparing for, I try to visualize them and see what's worked before and put myself in their place....

Expert 2 also uses the same mental map to attend to cues that signal ways in which she needs to adjust her previous planning. It's almost as if the cues to which she attends appear as detours or construction zones on this map, telling her to 'slow down,' or 'speed up' or 'turn here.' As Expert 2 talks, she pulls out an agenda sent her by the school district that is sponsoring the workshop. She says that the agenda contains the names of the trainers, workshop topics, and times of the presentations that are scheduled throughout the day. As Expert 2 examines this agenda it seems as if her mental map becomes more and more focused, so that she's able to translate the cues taken from the agenda and her own experience as a trainer into the type of activity she will use and the amount of time that she will have for each subsection of the workshop she's planning.

Ex. 2: As I look at the agenda, I see that I'm on after lunch... probably you can hear in the tone of my voice that [this fact] brings up some flags... now that I see this, maybe I need to do a little bit less talking [in the workshop] and little bit more doing, so that they're [the participants are] engaged....after lunch it's better to do just a little talking and then immediately get them involved, and then go back to talk, cause otherwise it lulls them to sleep. You can't put them into an activity right away, because they're unfocused....some of them have gotten lunch, some of them haven't 'cause they've been making phone calls back to their offices to find out what's been going on. After lunch it's even more important to get them focused. That means that I'll have about ten minutes to talk, give them 15 or so minutes for an activity and then have a few minutes to sum up.

Although many trainers might know that the workshop slot after lunch is usually a "deadly" one, Expert 2 actively uses this information to calibrate the construction of the workshop so as to make it less "deadly."

When asked what she is thinking as she plans for the 15 minute activity period available to her, Expert 2 says that she's already decided that she wants to select an activity that will allow her to talk about the topic, bring the group into focus and allow her to model behavior that she would like to see them use. The theme of modelling is one which emerges quite strongly in Expert 2's think aloud, and is the fourth and final theme of this case study. By modelling, this expert states that she is able to incorporate an activity that permits her to achieve several goals at once.

Expert 2 thinks she'll probably administer a needs assessment instrument to the participants to show them the first step in building a solid staff development program. By choosing an activity such as a needs assessment, she is able to talk about her topic of staff development, provide techniques that the participants can use, and through modelling, demonstrate the impact that such activities will have. Expert 2 describes a conversation that she had with another trainer who had worked previously with the district in which the concept of modelling emerges. From her detailed recollection of this conversation, it is evident that Expert 2 feels that the other trainer's reinforcement of her proposed modelling activity underlines her commitment to "practicing what she preaches."

Ex. 2: I asked...what he felt would be most helpful and he said, "...you should do a needs assessment with them to determine common needs, so that as you start the workshop, you can share the results of your needs assessment with them. That way, they'll know that you heard what their needs are. By doing that, you'll be modelling for them [the material] you'll be presenting... that is, you'll reinforce that staff development programs start from stated needs."

However, Expert 2 has also already decided that she won't use the needs assessment activity unless she finds out that there will be an opportunity to return and provide feedback on the outcome of the needs assessment. This, too, is part of her

modelling behavior. Expert 2 talks about how she'll decide which needs assessment instrument to use.

Ex. 2: Well, I know which needs assessment instruments I have and how long it generally takes people to fill them out, and even though they're not perfect, they serve the purpose. Also, the fact that the needs assessments instruments are not perfect allows me to model the fact that you don't have to wait until you have a perfect instrument to do staff development, that just the process of giving people a chance to have input is the important thing.

#### Discussion of Case Study 2

From this second case study, it appears that Expert 2 consciously finds ways to make planning "a living process." Extensive planning and revision, then emerge as the first theme of the case study. She takes advantage of opportunities, even unexpected ones, to seek out information and feedback on the workshop she is planning, although she, like Expert 1 appears to devote minimal time to acquiring the actual content that will be presented in the workshop. The second theme that appears is that of self-monitoring. Expert 2 also appears to find ways to make evaluation and self-monitoring of her previous planning a living process. She evaluates her ideas for the workshop again and again, absorbing new pieces of information and fitting them into the overall planning picture.

The third theme of the case study is that Expert 2, like Expert 1, demonstrates that she has a well-formulated and comprehensive mental picture of the workshop process. Expert 2 employs this comprehensive mental picture to decipher and act upon cues that signal the need for revision of her plans. These cues also help her anticipate and avoid possible problems. Finally, Expert 2 plans to use activities that allow her to achieve her goals. She plans to model the behaviors that she wants participants to use as a way of achieving several goals at once.

### Case Study 3

Expert 3 taught at the elementary (Grades K-3, 4-5) and college/adult level prior to becoming a teacher trainer. She has taken teaching methodology courses at the elementary level. She has never taken any formal workshops or courses on training, however. Prior to joining the staff of the training center she had given more than fifty workshops.

The workshop that Expert 3 chooses to describe is one that she has just given. Prior to taping she stated that because she had given the workshop so recently, she couldn't really get it out of her head long enough to focus on another upcoming workshop. Expert 3 was clearly still processing information from her previous workshop. Although the



circumstances of this think aloud interview vary somewhat from the other two case studies presented, they point up an important aspect of workshop planning: reflection on previous workshops often constitutes an important part of planning for future workshops.

Another thing that makes this case study different from the first two is that Expert 3 planned and presented this workshop in tandem with another trainer, one with whom she has worked previously, but one who does not currently work at the training center. It was, therefore, important to ask Expert 3 if the way she planned for this workshop was representative of how she planned for others. She explained that in large part, it was, although she also stated that some things were different.

Expert 3: When I do it myself, I wind up writing a very sketchy outline, the points that I want to stress (I do that on one page and it goes on the computer) and then I start thinking, OK, under this item what can I do to bring them to this point. Very often the principles are phrased in questions. In effect, it is a little different, because I start out with a more succinct outline, a real outline, then I start then developing more. When I planned with the other trainer, I didn't start with an outline, per se, but just some ideas.

However, Expert 3 indicates that she uses the other trainer that she is working with much as Experts 1 and 2 used people such as the project director and the district contact person: as a sounding board for ideas that she has already

developed about the workshop. In fact, she states, "it helps me crystallize my thinking."

The workshop that Expert 3 can't get out of her head is one that is designed to sensitize science teachers to the way in which language interacts with science teaching, particularly for limited English proficient students. The workshop is part of a larger training session to be conducted over an entire weekend, from Friday to Sunday. Substantial portions of the weekend have been devoted to providing the teachers with information and activities to promote interactive science classes. Expert 3 and her partner have been asked to participate along with the teachers in science sections of the weekend training session. Expert 3 indicates how this influences the planning process and shows how the planning process stretches out to encompass the time up to and including the workshop. As in the case of Experts 1 and 2, planning, for this expert, is an continual process - one which stretches into the workshop delivery phase.

Expert 3: ...we had preplanned what we had wanted to do... we had sketched out what we wanted to do with the group as far as what we felt were some of the critical language issues were in teaching science content...given what we knew about the audience, given what we knew about the project. However, our goal was to participate with the teachers during the other parts of the weekend because during the process of interacting as members of the whole group, we would maybe reconfigure our workshop and re-think some of the issues that we wanted to present and in fact, that's exactly what happened.

When Expert 3 is asked whether she knew in the beginning stages of planning that reconfiguring would be something she would eventually want to do, she indicates that this is indeed the case. Expert 3 illustrates this example vividly by describing several planning events that take place prior to presenting the workshop.

Ex. 3: That [reconfiguring] was actually part of the plan...and we built in time for that kind of planning...when we [the other trainer and I] went in to participate in the science activities with the teachers, we decided to focus on how they were using language in the process of participating in the workshop, what questions they raised and then we decided we would meet after the session. So at 9:00 at night, we went back to the hotel and met for two hours.

Expert 3 indicates that during the two hour meeting, based on what she and her partner had seen during the science activities session, they revise their original plan. However, they also feel that they still need more planning time, and agree to meet for an hour in the morning right before they are supposed to present. During the morning meeting, final decisions about workshop activities and materials are made. Expert 3 explains, "I usually crystallize very close to presentation time...bringing it all together comes right down to the wire."

The planning process for this workshop doesn't stop there, however. Expert 3 says that during the workshop, the

second activity that has been planned takes more time than originally anticipated, so more planning occurs as the workshop was in process.

Ex. 3: Because the time was so short, we modified right there on the spot. We showed the participants our overview and asked them which part they would like to eliminate, given the short timeframe. They chose the discussion of the key concepts. I was very uncomfortable with that. So I said, let's compromise. Let's put the key concepts up and have you choose two that you want to explore more.

In this instance, Expert 3 finds ways to overtly involve the participants in the planning process. However, she also recognizes that the choice made by the participants will not allow her to accomplish her goals for the workshop. She strikes a compromise; one which shows participants that she is interested in meeting their needs, but one which allows her meet her goals.

The second theme that emerges in the think aloud with Expert 3 is that she, like Expert 1, develops a plan of what knowledge and skills she would like the participants to come away with prior to making decisions about specific content or activities. This plan guides her preparation for the workshop. Although the plan developed for this workshop is a plan that has been jointly developed by Expert 3 and her partner, the plan she usually develops normally contains four or five principles.

Ex. 3: ...And I would do the same thing if I were to plan independently. What five points do I want them to arrive at, or what five skills do I want them to develop by the end of the session... and that, then, becomes my point of reference as I plan the process that's going to get them to those skills or pieces of information.

Expert 3 expands on the importance of the plan in her workshop preparation and shows how it influences the structure of the workshop.

Ex. 3: It's never about giving them information. That is not what training, for me, is about. It's about getting them [the participants] involved in the process, and making them come to the realization of where I want them to go. I know what I want them to go away with... the more critical piece is how to get them there, what kinds of questions can I engage them in, and what kinds of charts can I use to help them synthesize their thinking.

As she goes through the process of pulling together materials and activities for the workshop, Expert 3 once again illustrates the importance of the plan to content and activity selection.

Ex. 3: ...we looked at the principles that I had written and we thought about how these two things [the principles and a videotape that Expert 3's training partner had supplied] could be woven in together. How could we cover this content, how does this videotape fit in and how do we engage the students initially, how do we grab their interest?

At another point, Expert 3 says, "Once we had decided the placement of the video... we had the end, we had the next to the end, and we had the principles... We didn't have the

middle. We had ideas, but we just didn't know how we were going to do it."

Expert 3 indicates that she and her training partner have brought several handouts and materials to the workshop with them; they have each gone through their files for things they can "plug in depending on what happen[s]" when they finally have a chance to interact with the participants in the science activities. Again, however, the plan has facilitated their ability to be flexible about the actual structure of the workshop until such time as more information becomes available to them.

By constantly thinking about the plan and referring to it over and over again throughout the planning process, Expert 3 is constantly sizing up workshop activities and content to see how they relate to the goals and outcomes she has set for the participants. The plan, in effect serves as an evaluation tool, a yardstick that allows Expert 3 to judge the relevance of certain activities.

The third and final theme that emerges from the think aloud interview with Expert 3 is the relationship of her planning process to the cognitive or learning processes of the participants she will be training. The activities that Expert 3 ultimately selects are those that not only conform to her plan, but those that will influence the cognitive processes of

the participants. For example, she talks about handouts and activities as a way of helping participants organize their thinking.

Ex. 3: ...people will take very different kinds of notes. I'm not so sure that they'll get everything that I want them to have in their notes. Somehow, the handout guarantees that they're all going away with one consistent piece of information, and it isn't just the notes they've taken, which may be very different. Very often, I'll give them an outline of the questions we'll be discussing... it's an organizer for them. In this workshop, we did the organizer on a transparency, but I always do use some kind of organizer.

She also talks about selecting activities in such a way as to build on participants' prior knowledge and trying to establish connections between what participants have learned in the workshop to their lives in the classroom.

Ex. 3: Going back, the final decision we made that morning was to give them some kind of pre-organizer... some kind of opportunity to think about, to reflect on what they had done the night before, connecting it to language. We decided on a quiet reflection to let them think about the implications of what they had done the night before for second language learners...  
...the second activity we decided on was a whole group discussion.... Our focus was to get them to think about the differences that they might encounter as they tried to implement the activities from the night before in their own classrooms. We were trying to make the connection between what they had been able to accomplish using interactive science and what the kids might be able to do.

Expert 3 is able to clearly articulate the relationship of each workshop activity to the cognitive processes of the workshop participants. She thinks about each activity by

relating it to the cognitive effect she hopes it will have. Expert 3, in effect, plans her workshop by measuring the cognitive payoff that each activity offers in terms of the participants' ability to transfer learning and behavior to the classroom when they return to their schools.

### Discussion of Case Study 3

Expert 3, like Experts 1 and 2, uses an extended planning process that carried over into workshop delivery. This is the first theme of the think aloud interview. Expert 3 knows that her planning will probably be reconfigured as new information becomes available to her and builds time for reconfiguration into her planning schedule. Expert 3 even finds a way to involve the workshop participants in planning when an activity she originally intended to use takes too much time and she is forced to re-think her options in the middle of the workshop.

The second theme is that Expert 3, Like Experts 1 and 2, has developed two principles that guide her planning throughout. These principles are that she must determine what she wants participants to know, and that she must determine how she is going to get participants to that point. She uses these principles to gauge the relative value that specific content and activities hold for having participants achieve the outcomes that she has established for them. Although



Expert 3 thinks frequently about the content she will be presenting to participants, she, like Experts 1 and 2, spends little time acquiring or learning the content that she intends to present.

The third and final theme of the interview is that Expert 3 frequently refers to the cognitive processes of the workshop participants whom she will be training. She focuses on the cognitive impact of each activity and in effect, builds a cognitive scaffold from which participants can continue to learn.

#### Summary of the Case Studies

The case studies presented here provide a view of the way three expert trainers plan for workshops. Although each case study was examined as an independent data set, certain global themes appear across all three interviews. First, the experts appear to use planning as a process, rather than an event. Their planning often carries over into the workshop itself, as they piece together information which will make the workshop more meaningful for the participants. They readjust their plans based on these new and relevant pieces of information. The experts often seek input and feedback from others who have worked in similar settings or with similar audiences. They

know who to ask to get the information they need at each stage of the planning process.

A critical factor that facilitates this long-term planning and last-minute revision is the extensive repertoire of training activities and materials that all three experts seem to possess. These materials and activities are "tried and true" pieces of other workshops that they've delivered in the past; training routines that have been tested and perfected over time. The fact that experts possess and are able to simply revise or refine these materials and activities may help to explain why the experts spend so little planning time in learning or acquiring content themselves.

The second global theme that springs from the interviews is that these three experts have a good idea of how each workshop will look at the beginning of the planning process. They formulate plans or principles that they use to guide them through the planning and revision process and that help them self-monitor. They monitor their planning frequently to make sure that they are on course. The experts also listen and observe for cues that serve as evaluation tools that guide their planning. The cues are pieces of information that are gathered in ways other than directly asking for and receiving information, such as watching peoples' faces or inferring meaning from the fact that a workshop is scheduled after

lunch. The experts not only notice these cues, but more importantly, use them to redirect or refine their planning. The third and final global theme of these three interviews is that the training philosophy held by each expert is evident and articulated in the planning process. Expert 1, for example, talks of the importance of social-affective factors extensively; she consciously structures her workshops so that participants' affective needs are met. Expert 2 talks of the importance of modelling certain behaviors; she plans activities that allow her to model. Expert 3 indicates that training, for her, is never about "giving information;" she, therefore, plans activities that will cognitively engage participants.

Although these global themes have emerged from the planning processes of these experts, it is entirely possible that case studies of other experts would reveal different themes. It is also possible that had the experts selected different workshops, different planning strategies would have emerged. However, given how little is known about the planning processes of training experts the case studies do provide descriptive information that may be useful in subsequent studies of training and expertise.

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### Introduction

Chapter Five provides a summary of the previous chapters, conclusions drawn from the study, and recommendations. The chapter is organized as follows: each research question or research hypotheses is presented, followed by its related findings; a discussion of the relationship of the findings to the related literature on expertise, training and teaching is offered; conclusions and implications are stated; and finally, suggestions for further research are described. The chapter ends with a discussion of general recommendations for programs that prepare training specialists and specific recommendations for training and developing teacher trainers.

#### Summary of the Study

This study consisted of two parts. The first part involved surveying 104 teacher trainers working at federally funded training centers throughout the United States, Puerto Rico, Guam and Samoa. Of the 104 trainers surveyed, 78 responded to a questionnaire that examined trainers' reported use of metacognitive, cognitive and social affective training strategies when preparing for workshops. The questionnaire

also asked trainers about their previous teaching experience, previous coursework in education methodology and previous coursework or workshops on training. Finally, the respondents were asked to name the best trainer in the center in which they worked, and were asked to describe the skills or qualities that contributed to the named trainer's expertise. All narrative and quantitative data from the questionnaire were analyzed for evidence of patterns of strategy use (particularly the use of metacognitive strategies), and the relationship between trainers' previous experience and their subsequent nominations as training experts.

The second part of the study examined the planning processes of expert teacher trainers. Think aloud telephone interviews were conducted with the three trainers who received the highest number of nominations as experts from their peers. The interviews were tape recorded, transcribed and analyzed. The unit of analysis was the process of thinking in each trainer who happened to be identified as an expert. Each think aloud interview was examined for evidence of broad themes related to planning. Finally, the interviews were examined for evidence of global planning themes that emerged in all three cases.

### Findings, Conclusions and Implications

This section describes the findings of the exploratory data analysis, research question and research hypotheses of this study. The relationship of those findings to the related literature on expertise, teaching and training is shown, along with conclusions, implications and directions for future research.

#### Findings From the Exploratory Data Analysis

One of the findings that emerged from the exploratory data analysis concerns the identification of skills that trainers see as markers for training excellence or training expertise: knowledge of content, social affective skills and planning/organizational abilities. In this study, when trainers described the skills or abilities that nominated trainers exhibited that seemed to indicate expertise, these three characteristics were the most frequently named. Furthermore, the characteristics were usually named together, as a triad of skills, rather than listed individually.

#### Relationship to the Research Literature

Although the research literature on expertise provides much support for the notion that knowledge of content, particularly domain specific content, is a critical

characteristics exhibited by experts (Chase & Simon, 1973; Chi, Glaser & Farr, 1988; Ericsson & Smith, 1991). There is also some support for the role that planning/organizational abilities play in the construct of expertise (Holyoak, 1991; Salthouse, 1991). However, a thorough review of the research literature on expertise (Chi, Glaser and Farr, 1988; Ericsson and Smith, 1991) reveals that to date there has been no discussion of the relationship of social affective skills to expertise. This omission might be due to the fact that many studies of expertise deal with contexts in which social affective skills were seen by the researchers to play only a minimal role or no role in defining expertise (chess moves, music, and motor skills required for sports and dance).

#### Conclusions and Implications

The role played by social affective skills in the construct of expertise would, in all likelihood, be negligible when discussing the expertise exhibited by chess experts or typing experts. However, it would seem that in fields like training (and any other field that requires extensive and sustained interpersonal contact), social affective skills may indeed play a role in how expertise is defined. In fact, for many fields, social affective skills might constitute a indispensable dimension of expertise.

Although the importance of social affective skills was mentioned initially by trainers in the exploratory data analyses, their importance also emerged in the think aloud interview with Expert 1. This expert not only appeared to embrace the importance of social affective skills as a cornerstone of her training philosophy, but she also found ways to construct training so that participants' social affective needs were met, as well.

The nature of training suggests that there are a wide variety of training contexts, content areas, and circumstances. It may therefore be the case that the type of role played by social affective skills in defining training expertise varies to some degree according to these same contexts, content areas and circumstances.

#### Need for Further Research

Explorations that examine the role social affective skills play in the concept of expertise are needed. In particular, basic research is needed to further examine the role that social affective skills play in defining training expertise. Additional studies that investigate the relationship of social affective skills to knowledge of content and planning/organizational ability are needed as well. Also called for are studies that delineate or define the



specific subset of social affective skills that appear to be markers for training expertise in various training contexts.

#### Research Question on Trainers' General Use of Strategies

The research question of the study focused on discovering how trainers generally plan for workshops. Specifically, the question was: what information processing strategies do trainers generally report using during the preactive planning phase of training?

#### Findings on Trainers' Preactive Planning Strategies

- All trainers report using a wide variety of strategies when planning for workshops. These strategies span the three major categories of metacognitive, cognitive and social affective strategies.

- Expert trainers, while employing the same general strategy categories, appear to spend little planning time on the content of workshops.

- Reported strategy use appears consistent across and within categories, with the exception of rehearsal strategies, which were the least frequently reported strategies used.

- Trainers' reported use of strategies appears to remain consistent in both familiar and unfamiliar contexts. The reported strategy use of experts mirrors that of trainers in general.

- Trainers' reported use of strategies in planning extends to post-workshop reflection in which trainers examine things that went well and things that did not go well during a workshop; this finding also appears to be true for experts.

#### Relationship to the Research Literature

The planning strategies that trainers report using in preparing workshops are similar to the general varieties of strategies reported by O'Malley and Chamot (1990) in their studies of high school students learning English as a Second Language and high school and college students learning foreign languages such as Russian and Spanish. That is, the strategies used by these language learners spanned the same categories (metacognitive, cognitive and social affective) as those reported by the trainers. It might be argued that the strategy categories were an artifact of the questionnaire used to survey the trainers since the questionnaire was based on the categories that emerged from O'Malley and Chamot's (1990) research and a framework of learning strategies that the

thinking about how to transform that content into meaningful learning experiences for students.

A review of the think aloud interviews conducted with the training experts reveals that although the experts appear to follow a pattern of strategy use similar to that reported by trainers generally, and tend to adhere to the broad framework suggested by Lowyck (1986), they often omit mention of the second step, acquisition of content. Acquisition of content was rarely, if ever, mentioned as a step in planning by experts. Although this seeming lack of attention to content might have been a function of the particular workshop that each trainer was planning for, (the workshops might have focused on topics on which these trainers had presented previously), it may be also be speculated that this omission of content acquisition may be one of the key features that distinguishes experts from non-experts; that is, experts have already built up large stores of powerful explanations and material that they draw on throughout the teaching or training process. This was certainly true in the case of the three experts in this study.

The third finding about trainers' reported strategy use in planning concerns the degree to which rehearsal strategies are used. This finding relates to another concept that appears in the work of Borko and Livingston (1989): teaching may be

researchers subsequently developed. However, O'Malley and Chamot's research and subsequent learning strategy framework was supported by the appearance of these same general strategy categories in the psychological literature (Brown & Palincsar, 1982; Chipman, Segal & Glaser, 1985). In addition, when trainers in the current study were given the opportunity to name additional strategies that they used in planning, the strategies that they mentioned seemed to fall quite neatly into the pre-established categories of this study.

In discussing the use of planning processes of teacher trainers it is also helpful to refer to the research literature on teacher planning. Although this research does not refer to planning strategies of teachers, *per se*, it does provide a framework from which to compare the planning of teachers and trainers. For example, Lowyck's (1986) studies of teacher planning reveal that planning takes place through a series of successive steps, but in a cyclical way. He describes these five steps as inspecting the assignment, acquiring content, determining content for pupils, organizing the lesson and designing a definite lesson plan. Borko and Livingston (1989) point out, however, that when teachers lack adequate content preparation, they spend much of their limited planning time learning the content of the lesson, rather than

characterized as improvisational performance. In improvisational performance, actors go on stage with a definition of the general situation and a set of guidelines for a specific role, rather than working from a detailed script. Such performers draw upon an extensive repertoire of routines while being maximally responsive to the audience and new situations or events.

The notion that teaching may be seen as improvisational performance appears to be somewhat at odds with research showing that teachers rarely deviate from plans they have made once teaching has begun (Peterson & Clark, 1978; Shavelson & Stern, 1981; Zahorik, 1970). However, it must be noted that Peterson and Clark (1978) document that as teachers gain experience, they are more likely to revise plans to respond to unworkable situations or less than ideal student responses. Peterson and Clark (1978) also report that the teachers who did not change their plans may have been less effective teachers.

Both the planning processes of trainers generally, and the planning processes of expert trainers specifically, appear to support the characterization of training as improvisation. The fact that rehearsal strategies (such as scripting and rehearsing) were the least frequently used strategies in the population of trainers generally seems to suggest that these

trainers (who were not novices in the traditional sense) do have certain knowledge structures that let them improvise certain aspects of their performance during a workshop. The expert trainers take this one step further.

The fourth finding of this study shows that experts not only improvise certain aspects of their performance, but they also improvise often and extensively. Throughout the think aloud interviews, there is evidence that the experts' highly developed cognitive schemata allow them to refine or restructure previously developed plans to respond to changing situations or needs. Although it may appear to some that the experts are "flying by the seats of their pants," this does not seem to be the case. The training improvisations follow the same general format as the improvisations of the actor: they incorporate well developed instructional content and routines into a set of general guidelines or plans which have been established for the workshop. For example, Expert 1 talks about having three or four activities in her mind that will take place, if appropriate. Expert 2 talks about using the lunch break before her workshop to "readjust things to make them more meaningful." Expert 3 talks about bringing several handouts and materials to the workshop in order to "plug in" whatever seems most appropriate, depending on what

happens when she finally meets and interacts with the participants.

It is also important to note that the general plans that drive the improvisations of the experts appear to reflect the training philosophy of each. This is a finding that emerged serendipitously from the think aloud interviews. The training philosophy of each expert is not only developed and well articulated in the planning process, but appears to play a significant role in the instructional routines used by each. For example, Expert 3 indicates that training, for her, is more than just "giving information." The types of instructional routines she tends to favor, therefore, are those that cognitively engage the participants in her workshops.

How do these examples of routinized behavior fit with the fifth finding that trainers appear to use similar strategies in both familiar and unfamiliar contexts? Wouldn't the fact that trainers regularly use such routines tend to limit the degree to which planning strategies are used in preparing for workshops, and thus, result in smaller proportions of strategies being used in familiar settings? Certainly, the work of Lowyck (1986), Shavelson (1986) and Yinger (1978) suggests that this would be the case. However, as other researchers point out (Glaser, Chi & Farr, 1988; O'Malley &

Chamot, 1990; Scardamalia & Bereiter, 1991), there is one activity in which experts in a variety of fields have been found to invest more effort than novices: the activity of constructing a problem representation. Both the narrative responses to the questionnaire and the think aloud interviews with the training experts show that trainers tend to see each workshop as a new one, regardless of whether the topic is one on which they have presented previously. The task of problem formulation, therefore, (building a representation that defines, identifies and elaborates the situation as well as any constraints, goals and relevant principles that may apply) is one that occurs each time trainers begin to plan for a workshop.

Problem formulation in workshop settings involves sorting out the interactions among workshop topic, objectives, content, learning activities and audience characteristics. Therefore, although expert trainers may exhibit routinized behavior and skills in each one of these separate areas, the process by which they piece together the puzzle to form an integrated whole is one which appears to require a great deal of qualitative analysis every time a workshop is prepared.

The sixth and final finding about trainers' use of strategies involves the post-workshop reflections of trainers. Lowyck (1986) found that post-teaching reflection is



instigated mainly by negative experiences. However, the overwhelming majority of trainers in this study report post-workshop reflections which focus on not only what went wrong in a workshop, but also what went right.

Although the importance of reflection when things go badly has long been discussed as a function of expertise (Glaser & Chi, 1988; Lowyck, 1986), it might also be argued that in the case of teacher trainers, reflection on the things that go right is equally critical. Because teacher trainers report that they see each workshop as new, it makes sense that understanding what went right and more importantly, understanding why it went right would provide an important check on problem formulation.

### Conclusions and Implications

Trainers in this research study demonstrate that many of the planning strategies that they use in preparing workshops are similar to the strategies and processes reported in other areas of the research literature. Although expert trainers appear to follow the same planning trends as trainers in general, the experts in this study paid little attention to the acquisition of content when preparing workshops. A possible explanation for this lack of attention to content is that training experts have built up powerful stores of content

knowledge and therefore, use this knowledge in a routinized way.

Training, like teaching, appears to be an improvisational act. Trainers use scripting and rehearsal less frequently than other strategies generally, and expert trainers can be seen to alter the structure of workshops dramatically (even while the workshop is in progress), as the immediate situation dictates. All of this improvisation, however, appears to be guided by an overarching plan that has been shaped, in part, by the training philosophies of the experts.

Trainers, particularly expert trainers, spend a great deal of time representing problems (in this case, workshops). They appear to see each workshop as new, and although the topic and audience may be familiar, trainers appear to spend a great deal of time analyzing the interactions of topic, content, activities, audience, and timeframe.

Finally, trainers use post-workshop reflection to assess what went right and what went wrong with a workshop. This reflection may serve as a check on initial problem representation.

#### Need for Further Research

The expert trainers in this study all appeared to have large stores of content knowledge. Although it seemed that the

experts in this study did not acquire new content due to these already large stores, additional research that explores the way in which training experts add to the knowledge they have already built would provide useful information that furthers our understanding of training expertise.

There is a need to further explore the nature of training as an improvisational act. Because this study focused only on the preactive planning processes of trainers, there is no way of knowing, other than through the experts' self-reports, how much of trainers' original plans are actually implemented in workshop settings. By observing several trainers in both the preactive and interactive stages of planning over a period of time, conclusions could be drawn about the true nature of the improvisations that trainers undertake.

Further research on the nature and development of trainers' philosophies of training is needed. It would also be critical to further explore the relationship of such training philosophies to the training practice of experts.

The nature of post-workshop reflection and its relationship to future planning is also an area that requires further study. One specific area that would be particularly important to explore is whether a training program of systematic post-workshop reflection could influence future planning and workshop delivery. Comments that emerged from the

think aloud interviews with the expert trainers point to the fact that the experts have changed their training practice as a result of "lessons learned" from previous training. For example, Expert 1 says that in her six years of training she has learned that ambiguity of workshop topic (due to wildly divergent perceptions of training needs) is a problem that must be dealt with, rather than avoided. Although Expert 1 came to this understanding on her own, over time, a study of training programs could help to uncover whether post-workshop reflection training would result in better training practice.

#### Research Hypothesis One: Use of Metacognitive Strategies

The first research hypothesis of the study examined the use of metacognitive strategies in experts and non-experts. Specifically, the hypothesis stated that expert trainers would use a significantly different proportion of metacognitive strategies than would non-expert trainers in the preactive planning phase of planning.

#### **Findings on Expert Trainers' Use of Metacognitive Strategies**

- No significant differences were found in the use of metacognitive strategies by expert and non-expert trainers, although expert trainers use metacognitive strategies

extensively, particularly those related to planning and self-monitoring.

#### Relationship to the Research Literature

This finding appears to contradict previous findings in the literature on expertise (Bereiter & Scardamalia, 1987; Chi, Glaser & Rees, 1982), and in particular those of O'Malley and Chamot (1991), who found that effective learners reported using a higher proportion of metacognitive strategies than ineffective learners. However, if the hints of differences in the strategy use observed for experts and non-experts in the exploratory data analysis are, in fact, real, then it may be said that the questionnaire construction, small sample size, and non-normal distribution of the data in the quantitative analysis might have effectively obscured those differences.

In contrast to the quantitative data, the qualitative data generated by the think aloud interviews provides some evidence that expert trainers do use metacognitive strategies, particularly those related to planning and self-monitoring or self-evaluation. In fact, the experts in this study strongly resemble the portraits of experts painted elsewhere in the literature (Chi, Glaser & Farr, 1988; Dorner & Scholkopf, 1991; Scardamalia & Bereiter, 1991). For example studies of expert writers found that the experts generally work harder at

the same assigned task than non-experts, engaging in more planning and problem solving, more revision of goals and methods, and in general, "agonizing more about the task" (Scardamalia & Bereiter, 1991, p.172). The three experts interviewed in the think alouds clearly exhibit this same pattern of extended planning sequences, revising and re-revising, and if not agonizing, then at least worrying about whether they've gotten the workshop "right."

In addition, the planning processes of the experts seem to conform to the way in which experts have been shown to control complex systems, that is, situations which are dynamic, uncertain and "intransparent," (Dorner & Scholkopf, 1991). Examples of successful planners and problem solvers show that strategic flexibility, flexibility that allows one to adapt one's mode of behavior to the varying demands of the changing situation, is often critical to one's success. Problem solvers and planners of this type follow a sequence of self-instructions while constantly controlling the appropriateness of the strategy they are using.

For instance, a trainer gathering information to use in planning a workshop may stop briefly, recapitulate why the data was needed, or what the original intention or overriding goal was. In this type of planning, the trainer jumps from a current activity back to a superordinate goal.

Evidence of strategic flexibility in planning abounds in the think aloud interviews with the three expert trainers as they check and re-check their information, thoughts and plans for workshops.

Self-monitoring is another closely related strategy that is frequently cited in the literature on expertise. Glaser and Chi (1988) state that experts seem to be more aware than novices of when they make errors, why they fail to understand, and when they need to check their solutions. In fact, one of the key characteristics of the expert trainers that emerged during the think alouds was their ability to self-monitor and constantly evaluate during the workshop planning process.

Further, Glaser and Chi (1988) speculate that experts' ability to self-monitor reflects their greater underlying knowledge of the domain. This, too, appears to be the case with the training experts; the mental map that each was able to use to guide them in the planning process may be evidence of this greater underlying knowledge.

### Conclusions and Implications

Although the finding emerged that experts and non-experts appeared to use similar proportions of metacognitive strategies, this finding cannot be considered conclusive for two reasons. First, the exploratory data analysis provided

hints that this may not be the case; expert trainers exhibited a pattern of higher frequency of strategy use generally, and the discrepancy in the range of strategy use for experts and non-experts was appreciably higher in the metacognitive category. Second, and perhaps more importantly, the responses of the training experts during the think aloud interviews exhibit striking similarities to the characteristics of experts described in other studies of expertise with regard to metacognitive strategy use.

In addition, there are several important factors that may have influenced the outcome of this finding. These factors are related to the expert identification process, the expert nomination process, and the expertise-capturing process used by this study. Each of these factors will now be discussed.

It must be remembered that the trainers who were classified as non-experts in this study were quite different from the subjects classified as novices or ineffective subjects in other studies. That is, the trainers classified as non-experts were simply those who had failed to receive a sufficient number of nominations to be placed in the "expert" category; they were not people who had never trained previously.

The process of categorizing subjects as experts is one which is relatively arbitrary, given that there is probably a



hints that this may not be the case; expert trainers exhibited a pattern of higher frequency of strategy use generally, and the discrepancy in the range of strategy use for experts and non-experts was appreciably higher in the metacognitive category. Second, and perhaps more importantly, the responses of the training experts during the think aloud interviews exhibit striking similarities to the characteristics of experts described in other studies of expertise with regard to metacognitive strategy use.

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The process of categorizing subjects as experts is one which is relatively arbitrary, given that there is probably a

range of positions on a hypothesized continuum of expertise along which individuals could be placed (Salthouse, 1991). The fact that the non-experts in this study may have been closer to expert end of the continuum than, say, a layperson or a beginner, is one that may have ultimately accounted for the differences observed in the reported metacognitive strategy use of experts and non-experts. Trainers who are more like experts might be expected to use a higher proportion of metacognitive strategies than laypersons or beginners and thus, might not look as though they were using the strategies in a significantly different way.

Another factor that may have influenced this finding is the nomination process used to designate the experts. Salthouse (1991), cautions that consensual judgments of expertise should be avoided, because they can be influenced by a variety of characteristics other than true competence, such as popularity or reputation. He states that measures of expertise should represent some actual measure of competence. Although the expert nominations in this study were grounded in the notion that expertise stemmed from three areas of competence - content knowledge, social affective skills and planning/organizational abilities - these three areas emerged *post hoc*, and were not directly measured prior to classifying trainers as experts. It is impossible to know, therefore, if

the experts were equally expert; that is, were the experts equally competent in all three areas or were they extremely competent in one or two areas and less competent in a third? The fact that the experts may not have been equally expert may have ultimately played a role in the experts' reported frequency of use of metacognitive strategies, and thus, may help to account for the lack of significant difference between experts and non-experts.

A final area of concern is the way in which strategy use was defined and reported in this study. In capturing expert-level performance, "one attempts to create a situation that is maximally simple and yet sufficiently similar to the real-life situation to allow the reproduction of expertise under test conditions," (Ericsson & Smith, 1991, p.17). In complex domains such as the domain of training, Ericsson and Smith (1991) state that it is especially difficult to identify and standardize a population of tasks and strategies that capture expertise. This is particularly true when the definition of expertise is still in the process of being refined, as is the case with the current study. In addition, because research in the psychological processes of training is still in its infancy, the identification and standardization process is just beginning (Maddocks, 1991). Although even the most highly refined standardized tasks may fail to capture some of

the essential elements of training expertise, until such time as tasks are identified and standardized, research on training expertise may continue to be hampered by these limitations in capturing expert performance.

If further research that addresses the concerns listed above shows that training experts are indeed using a higher proportion of metacognitive strategies than non-experts, we may be able to conclude that training experts are much like experts in other domains; if, however, additional studies fail to disconfirm the finding, then we must conclude that training expertise is very different from other kinds of expertise, and we must begin to explore the causes for this difference.

#### Need for Further Research

The finding that experts and non-experts appear to use similar proportions of metacognitive strategies requires further investigation. The finding requires further investigation not only because it appears to be somewhat different from what other studies of experts and non-experts have shown or suggest, but also because the data in this study provide hints that this may not be the case.

Prior to conducting such research, however, it would be important to design and implement studies that would address the three important research design needs that this study

helped to confirm: the need to better define what is meant by training expertise, the need to develop better measurements of training expertise and the need to identify task and strategies capable of capturing such expertise under controlled conditions. Each of these needs will now be addressed.

There is a need to better define what is meant by training expertise. Although the *post hoc* analysis showed that trainers in this study identified knowledge of content, social affective skills and planning/organizational abilities as markers of training expertise when nominating their peers, we do not know if these three areas are markers for trainers in general, or if some other combination of skills and abilities would more clearly delineate training expertise. In addition, we need to understand the relationship among the three areas that were identified. To what degree does expertise in training relate to each of the three areas? For example, can trainers really be considered experts if their social affective skills are superior, but their content knowledge is less than superior? Is there some combination of skills that signals expertise more than some other combination of skills? Are there thresholds of competence in each of the three areas that must be achieved if one is to be considered an expert? Can any or all of these thresholds be achieved without one

being considered an expert? Studies that explore each of the three areas, as well the interrelationship of these three areas would help to clarify what each of the areas contributes to the overall perception of expertise.

Third, there is a need for research that explores the development of objective measures of training competence, particularly those that pertain to the three areas identified as indicative of training expertise (content knowledge, social affective skills and planning/organizational abilities). Studies that focus on the development of such measures would permit the identification of training experts by a process other than nomination.

Overall, the need for continued research that illuminates, rather than obscures differences between experts and non-experts is clearly called for. There may or may not be differences in the metacognitive strategy use exhibited by the experts and non-experts in this study; although the exploratory data analysis and the think aloud interviews hint at differences, quantitative analysis fails to confirm them. Studies that explore the differences between experts and non-experts who are clearly non-experts may help to further delineate these differences. Studies that employ more powerful quantitative analysis techniques or more extensive qualitative analysis may also help to further delineate the differences.

And finally, studies that utilize standardized and well-tested performance tasks and strategies may help to confirm if such differences, do, in fact, exist.

One final need for additional research is for more qualitative research that continues to examine training. Because the present study examined only three training experts, it is impossible to tell if other training experts would plan in similar fashion. It would also be imperative to conduct qualitative studies with those who were truly training novices, since all of the "close-up" information in this study was derived from training experts. A close-up view of training novices would allow for more descriptive comparisons of the preactive planning processes of expert and non-expert trainers.

#### Research Hypothesis Two: Variables Related to Expertise

The second research hypothesis stated that the categorization of trainers as experts can be predicted by such variables as prior teaching experience, prior training experience and prior coursework or study of teaching and/or training.

### Findings on Factors Related to Trainers' Being Categorized As Experts

- Previous classroom teaching experience (except at grades 4-5) is not significantly related to trainers' being categorized as experts, although all of the experts in this study had also taught previously at grades K-3.

- Previous coursework on teaching methodology and previous coursework on training methodology is not significantly related to trainers' categorization as experts.

- Experts appear to be able to use their previous experiences and knowledge base in a way which helps them to implement and sustain the dialectical processes of training.

#### Relationship to Research Literature

Experts have been shown to perceive large meaningful patterns in their domain; this superior perceptual ability is believed to be a reflection of an organization of the knowledge base experts possess (Glaser & Chi, 1988; Newell & Simon, 1972), and is, therefore, thought to be domain specific. In addition, many studies of experts show that when experts in one domain work at problem solving in another



domain, the nondomain experts solve problems much as novices do (Voss & Post, 1988).

If teaching and training are thought of as different experiences or domains, then it may be reasonable to assume that previous teaching experience would not be related in a significant way to training expertise. Such a view would conform to the related research on experts in other domains. This view would also permit us to speculate that the finding that teaching at grades 4-5 is significantly related to expertise is nothing more than a statistical fluke.

The finding that coursework or workshops on the methodologies of teaching and training is not significantly related to trainers' expertise is likewise one that may be explained through related research literature. Garb (1989), who reviewed more than fifty comparison of judgments by clinical psychologists and novices (untrained students and secretaries), found that although the experts performed better and better with each year of graduate training, the effect of training was not large (28% correct versus 40% correct, for example). Garb also reports, however, that training did not help at all on other tasks (such as interpreting projective tests such as Rorschach inkblots). As Camerer and Johnson (1991) point out, if training alone could make a person as accurate as an experienced clinical psychologist or doctor,

then lightly trained paraprofessionals could replace heavily trained experts.

If neither previous experience nor formal training helps to account for expertise, then what does? The findings that previous teaching experience (except at grades 4-5) and previous formal education and training do not appear to predict training expertise suggest that other factors may be operating to produce experts. One possible factor that may account for training expertise that was not addressed by this study is that the expert trainers in this study may have also been expert teachers. However, given the previously discussed research evidence showing that experts excel mainly in their own domains (Glaser and Chi, 1988), would such a factor be a plausible one? Could experts in the domain of teaching transfer that knowledge to another domain (training)? The research literature again provides important clues that help to explore this question.

Some studies of experts suggest that abstract types of reasoning skills acquired through systematic training can be applied in contexts quite different from that in which training occurred (Holyoak, 1991). Scardamalia and Bereiter (1991) not only support this notion, but take it one step further by showing in their studies of expert writers and readers that the interaction of domain specific competencies

with a particular immediate case may account for at least part of what it means to be an expert. Domain specific knowledge is used to interpret an immediate case, and in turn, the immediate case yields information that may be used to modify domain specific knowledge. In the case of training, for example, a general knowledge of teaching/training and the content area on which training will occur may be used to interpret or deal with the preparation of a particular workshop. In turn, the preparation of the particular workshop may yield information that modifies one's knowledge of training or content, thus creating a more specific knowledge of training on a particular content area.

In fact, Scardamalia and Bereiter's (1991) discussion of dialectical processes fits nicely with Anderson's (1990) description of how new knowledge becomes proceduralized and may even be an extension of the proceduralization process. In essence, the domain (or general knowledge of teaching and/or training) is a schema that has been developed. The immediate case (or particular workshop) supplies new declarative knowledge. The procedural system uses that new knowledge to guide behavior, applying the knowledge interpretively. Once the knowledge has been applied a number of times, a new set of productions can be compiled which applies the knowledge directly.

These give and take processes that Scardamalia and Bereiter refer to as "dialectical processes" may go through a number of cycles. Non-experts may stumble and fall at various points along the way: when domain knowledge is inappropriately applied to the immediate case; when the immediate case presents a problem that a non-expert is able to solve but unable to learn from; or even, more interestingly, when non-experts who are capable of using both domain specific knowledge and immediate case knowledge to learn, "lack the executive structure or self-regulatory skills needed to sustain" the dialectical processes (Scardamalia & Bereiter, 1991, p.176).

If the training experts in this study correctly applied their domain specific knowledge of teaching to the process of workshop planning, were able to learn from their mistakes, and were able to achieve high levels of self-monitoring and self-evaluation during the workshop planning/delivery process, it might be speculated that the experts became experts not because of their previous teaching experience at any particular grade level, formal education, or solely because they were expert teachers. The trainers who became experts might have done so because they were able to use their previous experiences and knowledge base in a way which helped them implement and sustain the dialectical process. Evidence

from the think aloud interviews with the experts suggests that this may indeed be the case. All three experts used domain specific knowledge of teaching/training (the mental maps or guiding principles) to shape a particular workshop they were planning; all three talked about how previous and current workshop experiences have added to or modified their general knowledge of training; all three experts employed self-monitoring and self-evaluation consistently and extensively throughout the workshop planning process.

#### Conclusions and Implications

Previous teaching experience (except at Grades 4-5), previous formal education in teaching methodology and previous coursework or workshops on training methodology were not found to be significantly related to trainers' expertise. However, the three experts in this study appeared to use their previous experiences and prior knowledge in a way that helped them to implement and sustain the dialectical processes referred to by Scardamalia and Bereiter (1991). This observation may, in fact, open the door on more promising research that examines the way in which such prior experience and prior knowledge is applied in new settings. If nondomain experts can become experts in another domain by transferring knowledge from the first domain to the second, by building upon domain knowledge

already acquired and in effect, by transforming knowledge by using the dialectical processes such as those suggested by Scardamalia and Bereiter (1991), then the specific nature of the previous experience or knowledge base becomes less critical to examine than the process by which such knowledge is transformed. The nature of the dialectical process as well as the psychological literature suggest that metacognitive strategies such as self-monitoring and self-evaluation again assume a pivotal role in the development of expertise. In fact, dynamic (rather than static) reflection, (that is, reflection that results in some action or change to one's knowledge base or behavior) may lie at the heart of the acquisition of expertise.

#### Need for Further Research

The finding that previous teaching experience is not significantly related to trainers' expertise except at grades 4-5, is one that raises more questions than it answers. The possibilities are strong that this finding may be nothing more than a chance occurrence; however, should the finding prove (through replication in other studies) to be something more than a chance occurrence, it would then be critical to define the specific skills or abilities required by teaching these grade levels that allowed the trainers to blossom into

experts. Moreover, given the fact that all of the experts also had teaching experience at Grades K-3, as well as formal training in elementary teaching methodology, it would be important to examine the likelihood that some combination of these experiences (rather than teaching experience at Grades 4-5 alone) contributed to the expertise in training that they subsequently developed.

The finding that previous experience in teaching and training generally appears unrelated to trainers' expertise points to the need to explore the nature of the dialectical processes themselves. First, research which further explores the specific nature of dialectical processes is called for. Next, research identifying the specific dialectical processes of training becomes a critical need, particularly research that attempts to uncover the ways in which these processes may be similar to or different from dialectical processes in other domains. Third, research that uncovers the specific relationship of metacognitive strategies to the dialectical processes of becoming an expert also assumes increased importance. Although we may speculate that experts have and use these metacognitive strategies in the process of becoming an expert, we still do not fully understand the circumstances under which such strategies may maximize the potential for

expertise, nor how they figure in the developmental process of becoming an expert.

Finally, research is needed to explore the effect of dialectical processes on the practice of training. Basic research that focuses on more thorough qualitative explorations of training processes (including on-site observations of workshop planning and delivery) would be particularly useful. In addition, studies that examine the effect of metacognitive strategy training on the workshop planning processes and workshop implementation patterns of trainers are called for.

#### Implications for Training Development Programs

The trainers in this study seemed to welcome the opportunity to talk or write (in the narrative responses to the questionnaire) about training. In fact, given the enthusiasm and extensive narrative responses provided by many of the trainers, one cannot help but wonder how many opportunities these professionals have to explore the process of training on a regular basis in a structured way.

All of the teacher trainers in this study work in training centers, making the structured exploration of the training process a feasible proposition. In addition, all of the trainers provide training on content related to the



instruction of limited English proficient students. Unlike some teacher trainers and other trainers generally, they have peers and colleagues who share similar training responsibilities and training topics with whom they can interact on a regular basis. And yet, from the trainers' responses to the item on the questionnaire which asked "what types of activities or experiences have helped you most in learning how to train?" it appears that few of the training centers provide regular and structured professional development for their own trainers.

Trainers, like teachers or other professionals, need preparation programs and programs of continuing professional development that allow them to learn or refine training skills and reflect on training practices. Although training, as the research shows, offers no guarantee that all trainers will become "experts," professional development programs could enhance the skills of many trainers. With \$45 billion budgeted in 1992 for employee training and development expenditures by organizations with 100 or more employees (Lee, 1992), and a sizable amount (no comparable figures are available) budgeted by school districts for on-going staff development programs, professional development programs that result in better trainers could pay off handsomely in better-spent training dollars.

The provision of professional development programs would be equally as important for professionals who are not working in training center settings or who train on a more infrequent basis. Further, because so many of the people who currently provide training (both professional trainers and those who give workshops on a sporadic basis) come to the field with little or no advance preparation in the training process, the establishment of such programs would go a long way toward ensuring that all trainers get off to a head start in beginning to untangle the "magical process" of how one becomes an excellent trainer (Watkins, 1990).

How would an ideal professional development program for trainers look? The findings of this study and the research on planning, training and expertise offer several clues. First, because the planning process appears to have a direct influence on the workshop delivery process, attention to planning would assume a larger role in the professional development of trainers. Of all of the aspects of planning that deserve attention, the role of problem formulation would be highlighted. Although problem formulation occurs largely in the heads of those preparing to train and is therefore a process that cannot be directly observed, ideal training programs would make the process of problem formulation more apparent to trainers by using planning think alouds based on

training case studies. In doing so, training programs would provide a way to make the "hidden world" of training (Clark & Yinger, 1980) more visible to those who navigate it.

Given the critical role that cognition plays in the performance of trainers and other professionals, ideal training programs would tap into the cognitive processes that appear to enhance training planning and delivery. Because strategy training has been shown to enhance the performance of learners on a variety of tasks including reading comprehension (Dansereau, 1985; Palincsar & Brown, 1989) and second language learning (O'Malley & Chamot, 1990), it is conceivable that strategy training programs for trainers could also hold promise for enhancing the performance of trainers.

Finally, ideal training programs would find a way to incorporate the collaborative activities that trainers say they find so useful in learning or refining training skills. Training experiences would be constructed to encourage ongoing collaboration with colleagues: for example, peer coaching programs in which trainers teach and support one another; tandem training programs in which two trainers are paired for workshop planning and delivery; and professional dialogue programs such as those suggested by Glatthorn (1989) in which trainers meet together regularly to reflect on training practice.

### Implications for Preparing and Developing Teacher Trainers

Although superior content knowledge is one distinguishing feature of experts (Borko & Livingston, 1989; Glaser & Chi, 1988), superior content knowledge alone does not a training expert make. In this study, a triad of skills and abilities appeared to be markers for training expertise: knowledge of content, social affective skills and planning/ organizational abilities. Although we do not yet fully understand the role played by social affective skills or planning/organizational abilities in training expertise, it seems clear that these skills contribute to what it means to be a training expert.

What also appears clear from both the literature on expertise and the findings of this study is that one cannot be considered an expert trainer without a superior knowledge of the content on which one is expected to train. Superior content knowledge was named by trainers as one of the markers for training expertise. In addition, the training experts all appeared to have superior content knowledge, given how little time they spent in acquiring content in preparation for workshops.

Although many training professionals find themselves training in a fairly wide array of content areas, there appears to be no question that trainers who have a strong foundation in the content have an advantage over those who

don't. The implications for preparing and developing teacher trainers are clear: start with or build up superior content knowledge in prospective trainers and work from there to enhance training skills.

While this statement may seem self-evident, the realities of training sometimes dictate that trainers prepare and deliver workshops that are outside of their areas of expertise. Trainers may be encouraged to use "canned" workshops, workshop "packages" that have may been developed by others for the sake of expediency. Although these workshop packages may help trainers who are unfamiliar with a content area see what the workshop package designer felt to be important, the use of such packages, may, in effect, subvert the problem formulation segment of the planning process and ultimately, "stunt the growth" of trainers. Because the problem formulation process requires that trainers analyze the task objective and their own resources for accomplishing it (O'Malley & Chamot, 1990), the imposition of someone else's analysis of the task may prove less effective than if trainers were to analyze the task themselves. In addition, trainers using canned workshops may fail to engage the interaction between their domain specific knowledge and an immediate case. Two implications arise from these statements; canned workshops may prove to be less effective than those developed "from

scratch;" and trainers will lose a valuable opportunity to learn from the dialectical processes of training.

### Summary of Conclusions

This study examines the preactive planning process of teacher trainers from an information processing perspective and provides a preliminary exploration of the differences that may exist between expert and non-expert teacher trainers. The study also offers suggestions for further research on the nature of training expertise.

In addition, the study provides some suggestions for the design of professional development trainers that have been drawn from the conclusions of the research findings, and explores the implications of the finding for the preparation and continuing development of training professionals.

The conclusions of this study may be summed up as follows:

- Trainers generally name three characteristics as markers of training expertise: knowledge of content, social affective skills and planning/organizational abilities. The characteristics are usually mentioned as a triad of skills, rather than being named individually.

- All trainers report using a wide variety of strategies

when planning for workshops. These strategies span the three major categories of metacognitive, cognitive and social affective strategies.

- Expert trainers, while employing the same general strategy categories as non-experts, appear to spend little planning time on the content of workshops.

- Reported strategy use appears consistent across and within categories. Rehearsal strategies (such as scripting and rehearsing what will be said and done during a workshop) were the least frequently reported strategies.

- Expert trainers report that they often improvise during workshops; these improvisations are guided by plans developed prior to workshop delivery, and appear to be shaped by the philosophy of training held by each expert.

- Trainers' reported use of strategies appears to remain consistent in both familiar and unfamiliar contexts.

- Trainers' reported use of strategies in planning extends to post-workshop reflection in which trainers examine things that went well and things that did not go well during a workshop.

- Although no significant differences were found in the reported use of metacognitive strategies by expert and non-expert trainers, expert trainers who were interviewed as they planned a workshop appeared to use metacognitive strategies

extensively, particularly those related to planning and self-monitoring.

- Previous classroom teaching experience (except at grades 4-5) is not significantly related to trainers' being categorized as experts, although all of the experts in this study had also taught previously at grades K-3.

- Previous coursework on teaching methodology and previous coursework on training methodology is not significantly related to trainers' categorization as experts.

- Experts appear to be able to use their previous experiences and knowledge base in a way which helps them to implement and sustain the dialectical processes of training.



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## Appendix A

Number \_\_\_\_\_

Planning Strategies of Teacher Trainers: An Information  
Processing Perspective

Directions: Please complete this questionnaire about what you actually do when performing certain tasks related to workshop planning.

The questionnaire describes several types of workshop planning tasks. Each task is presented separately. Below the title and description of each task are statements which describe planning techniques, practices, tools or strategies you might use to perform the task.

First, read the description of each task. Then read each statement about possible planning techniques. Circle one of the options (Never, Rarely, Sometimes, Usually or Always) to show how often you do the activity described.

The list of statements is not exhaustive, so if you do anything else when you plan, please jot it down in the space provided at the end of each page.

*There are no right or wrong answers. There are only answers that tell what you actually do. All of your answers will be held in strict confidence. The number at the top of this page is there solely to assist with follow-up on those participants who fail to respond initially.*

Once you have finished answering the questionnaire, please fill out the section which asks you to describe your previous teaching and training experience. At the end of that section, you will be asked to nominate the person you feel is the best trainer in your MRC. You will also be asked to describe why you feel that person is the best. If you feel that you are the best trainer, feel free to name yourself.

*Please return your questionnaire and signed consent form to me in the self-addressed stamped envelope provided by July 23, 1992. Thank you for your help.*

**Task 1: Preparing a Workshop on an Unfamiliar Topic**

*Description of Task: You have accepted an assignment which involves preparing a workshop on a topic which is new to you. The topic is one which interests you, but is not one with which you are very familiar.*

**How do you go about planning this workshop?**

1. I develop a plan which guides my preparation.

Never            Rarely            Sometimes            Usually            Always

2. I read as much as I can about the topic.

Never            Rarely            Sometimes            Usually            Always

3. I scan a lot of material on the topic, selecting a few things which I want to go back and read.

Never            Rarely            Sometimes            Usually            Always

4. I talk to other people who know about the topic to get a sense of direction of the things I should be including in this presentation.

Never            Rarely            Sometimes            Usually            Always

5. I set some tentative objectives for the workshop and try to relate the material I'm reading to the objectives I've set.

Never            Rarely            Sometimes            Usually            Always

6. As I begin preparing the workshop, I try to relate it to other topics I already know; other workshops I've already prepared and given.

Never            Rarely            Sometimes            Usually            Always

7. While I'm exploring the content of the topic, I try to relate it to learning activities I've used previously that could also be used in this workshop.

Never            Rarely            Sometimes            Usually            Always

8. I try to think of activities for participants to do which will help reinforce the content I'm presenting.

Never            Rarely            Sometimes            Usually            Always

9. I script out what I'm going to say.

Never            Rarely            Sometimes            Usually            Always

10. I rehearse what I'm going to say and do.

Never            Rarely            Sometimes            Usually            Always

11. I try to imagine the workshop in my mind, anticipating participants' responses and questions.

Never            Rarely            Sometimes            Usually            Always

12. Once I've decided on the content and activities for the workshop, I examine the amount of time I'll have and re-adjust the content and activities, adding and deleting material as necessary.

Never            Rarely            Sometimes            Usually            Always

13. I reassure myself that the workshop I'm planning will be successful.

Never            Rarely            Sometimes            Usually            Always

14. Other (please describe) \_\_\_\_\_

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*Task 2: Preparing a Workshop on a Familiar Topic*

*Description of Task: You have accepted an assignment which involves preparing a workshop on a topic which is familiar to you. The topic is one on which you have presented*

**How do you go about planning this workshop?**

15. I develop a plan which guides my preparation.

Never            Rarely            Sometimes            Usually            Always

16. I like to read as much as I can about the topic.

Never            Rarely            Sometimes            Usually            Always

17. I scan a lot of material on the topic, selecting a few things which I want to go back and read.

Never            Rarely            Sometimes            Usually            Always

18. I talk to other people who know about the topic to get a sense of direction on the things I should be including in this presentation.

Never            Rarely            Sometimes            Usually            Always

19. I set some tentative objectives for the workshop and try to relate the material I'm reading to the objectives I've set.

Never            Rarely            Sometimes            Usually            Always

20. As I begin planning the workshop, I try to relate it to other topics I already know; other workshops I've already prepared and given.

Never            Rarely            Sometimes            Usually            Always

21. While I'm planning the workshop, I try to think of learning activities I've used previously that could also be used in the workshop.

Never          Rarely          Sometimes          Usually          Always

22. I try to think of activities for participants to do which will help reinforce the content I'm presenting.

Never          Rarely          Sometimes          Usually          Always

23. I script out what I'm going to say.

Never          Rarely          Sometimes          Usually          Always

24. I rehearse what I'm going to say and do.

Never          Rarely          Sometimes          Usually          Always

25. I try to imagine the workshop in my mind, anticipating participants' responses and questions.

Never          Rarely          Sometimes          Usually          Always

26. Once I've decided on the content and activities for the workshop, I examine the amount of time I'll have and re-adjust the content and activities, adding and deleting material as necessary.

Never          Rarely          Sometimes          Usually          Always

27. I reassure myself that the workshop I'm planning will be successful.

Never          Rarely          Sometimes          Usually          Always

28. Other (please describe) \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

*Task 3: Planning a Workshop for a Familiar Audience*

*Description of the task: You have accepted an assignment to give a workshop. This workshop topic is one on which you often present. The time frame for the workshop is one within which you have presented previously. The audience is a group of teachers with whom you have worked before.*

**How do you go about planning this workshop?**

29. I talk to the person who has requested the workshop to find out as much as I can about the needs and background of the audience before I start putting the workshop together.

Never            Rarely            Sometimes            Usually            Always

30. I talk to colleagues who have given workshops to this audience before I start planning.

Never            Rarely            Sometimes            Usually            Always

31. After I've made a tentative plan, I talk to colleagues who have given workshops to this audience to see whether or not I'm on track.

Never            Rarely            Sometimes            Usually            Always

32. I think about my previous experience(s) with this audience and use that to guide my planning.

Never            Rarely            Sometimes            Usually            Always

33. I try to conduct a needs assessment with selected members of the audience prior to planning the workshop.

Never            Rarely            Sometimes            Usually            Always

34. Since I generally have a pretty good feel for the audience's needs, I can infer what activities will work.

Never            Rarely            Sometimes            Usually            Always



35. I plan out several potential workshop activities that relate to potential needs that the audience may have. When I begin the workshop, I explain these alternatives and let the audience decide which pieces will best meet their needs.

Never            Rarely            Sometimes            Usually            Always

36. I reassure myself that I have usually been pretty successful in designing workshops for this group in the past; this time should be no different.

Never            Rarely            Sometimes            Usually            Always

37. I script out what I'm going to say.

Never            Rarely            Sometimes            Usually            Always

38. Other (Please describe) \_\_\_\_\_

\_\_\_\_\_

*Task 4: Planning a Workshop for an Unfamiliar Audience*

*Description of the task: You have accepted an assignment to give a workshop. This workshop topic is one on which you often present. The time frame for the workshop is one within which you have presented previously. However, the audience is a new one for you.*

**How do you go about planning this workshop?**

39. I talk to the person who has requested the workshop to find out as much as I can about the needs and background of the audience before I start putting the workshop together.

Never            Rarely            Sometimes            Usually            Always

40. I talk to colleagues who have given workshops to this audience before I start planning.

Never            Rarely            Sometimes            Usually            Always

41. After I've made a tentative plan, I talk to colleagues who have given workshops to this audience to see whether or not I'm on track.

Never            Rarely            Sometimes            Usually            Always

42. I think about other similar audiences I've given the workshop to and use that to guide my planning.

Never            Rarely            Sometimes            Usually            Always

43. I try to conduct a needs assessment with selected members of the audience prior to planning the workshop.

Never            Rarely            Sometimes            Usually            Always

44. Since I generally have a pretty good feel for the audience's needs, I can infer what activities will work.

Never            Rarely            Sometimes            Usually            Always

45. I plan out several potential workshop activities that relate to possible needs that the audience may have. When I begin the workshop, I explain these alternatives and let the audience choose the activities that will best meet their needs.

Never            Rarely            Sometimes            Usually            Always

46. I reassure myself that I have usually been pretty successful in designing workshops for groups in the past; this new group should be no different.

Never            Rarely            Sometimes            Usually            Always

47. I script out what I'm going to say.

Never            Rarely            Sometimes            Usually            Always

48. Other (Please describe) \_\_\_\_\_

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## Task 5: Planning for Future Workshops

*Description of the task: You have just finished giving a workshop. Some things went as expected, other things didn't. You are scheduled to present this same workshop for another group in two weeks.*

**How do you incorporate your experience in giving a particular workshop into planning for future workshops?**

49. I think about the parts of the workshop that didn't go exactly as I planned.

Never      Rarely      Sometimes      Usually      Always

50. I think about the parts of the workshop that went well.

Never      Rarely      Sometimes      Usually      Always

51. I use the evaluations of the workshop to determine which activities I'll use again.

Never      Rarely      Sometimes      Usually      Always

52. I think about questions that participants brought up during the workshop.

Never      Rarely      Sometimes      Usually      Always

53. I think about the degree to which the workshop seemed to meet the actual needs of participants.

Never      Rarely      Sometimes      Usually      Always

54. I talk over the workshop with a friend or colleague.

Never      Rarely      Sometimes      Usually      Always

55. Other (please specify) \_\_\_\_\_

## Previous Teaching and Training Experience

56. Prior to becoming a teacher trainer, did you ever teach?

\_\_\_\_\_ Yes  
 \_\_\_\_\_ No

If you answered yes, please indicate the grades you taught and the length of time you taught each grade.

| Grade                | Length of Time |
|----------------------|----------------|
| _____ K-3            | _____          |
| _____ 4-5            | _____          |
| _____ 6-8            | _____          |
| _____ 9-12           | _____          |
| _____ College/Adults | _____          |

Other (please specify): \_\_\_\_\_

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57. Have you ever taken any formal courses or workshops which taught you how to train or deliver workshops?

\_\_\_\_\_ Yes  
 \_\_\_\_\_ No

If you answered yes, please briefly describe the types of things you learned in these courses or workshops :

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58. Prior to joining the staff of the MRC, had you ever done any teacher training or given workshops?

\_\_\_\_\_ Yes  
\_\_\_\_\_ No

If you answered yes, approximately how many workshops had you given?

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59. Have you ever taken any teaching methodology courses?

\_\_\_\_\_ Yes  
\_\_\_\_\_ No

If you answered yes, please name the course(s) and state whether they were designed for teaching at the elementary, middle school or secondary level (please continue on the back if you need more room).

---

60. What types of activities or experiences have helped you most in learning how to train or give workshops?

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61. Who would you say is the best trainer in your MRC? Please feel free to name yourself if you feel that you are the best trainer. (Please remember that all answers will be held in strict confidence).

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What skills does this person possess or exhibit that lead you to believe that s/he is the best?

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Thank you for your help!

Classification of Questionnaire Items  
by Strategy Category and Type

Planning Scenario #1: Unfamiliar Workshop Topic

1. Metacognitive - Planning
2. Cognitive - Resourcing
3. Metacognitive - Selective Attention
4. Social Affective - Cooperation
5. Metacognitive - Planning
6. Cognitive - Elaboration
7. Cognitive - Elaboration
8. Cognitive - Inferencing
9. Cognitive - Rehearsal
10. Cognitive - Rehearsal
11. Cognitive - Imagery
12. Metacognitive - Evaluating
13. Social Affective - Self-Talk
14. (Open Ended)

Planning Scenario #2: Familiar Workshop Topic

15. Metacognitive - Planning
16. Cognitive - Resourcing
17. Metacognitive - Selective Attention

18. Social Affective - Cooperation
19. Metacognitive - Planning
20. Cognitive - Elaboration
21. Cognitive - Elaboration
22. Cognitive - Inferencing
23. Cognitive - Rehearsal
24. Cognitive - Rehearsal
25. Cognitive - Imagery
26. Metacognitive - Evaluating
27. Social Affective - Self-Talk
28. (Open Ended)

Planning Scenario #3: Familiar Audience

29. Social Affective - Questioning
30. Social Affective - Questioning
31. Metacognitive - Evaluating
32. Cognitive - Transfer
33. Social Affective - Questioning
34. Cognitive - Inferencing
35. Social Affective - Cooperation
36. Social Affective - Self-Talk
37. Cognitive - Rehearsal



38. (Open Ended)

Planning Scenario #4: Unfamiliar Audience

39. Social Affective - Questioning

40. Social Affective - Questioning

41. Metacognitive - Evaluating

42. Cognitive - Transfer

43. Social Affective - Questioning

44. Cognitive - Inferencing

45. Social Affective - Cooperation

46. Social Affective - Self-Talk

47. Cognitive - Rehearsal

48. (Open Ended)

Planning Scenario #5: Post Workshop Reflections

49. Metacognitive - Selective Attention

50. Metacognitive - Selective Attention

51. Cognitive - Transfer

52. Metacognitive - Selective Attention

53. Cognitive - Inferencing, Deduction

54. Social Affective - Cooperation

55. (Open Ended)

## Appendix B

## Think Aloud Interview with Expert 1

Researcher: Tell me a little about the workshop you're going to be planning.

Expert 1: It's the first of a series of workshops that we're going to do with aides and the first of two sessions to be given over one week. The function of the workshop has changed as I've talked to the [project] director. Originally, it was going to be methods oriented, but because of some problems with some of the staff people... we (the Director and I) got into some elaborate conversations about what this group needed, and it's ended up that through our conversations we decided that it would be helpful to have this group talk about their job description... We have about three hours to work on this on Monday and having talked about this, have them define what they uniquely bring to their jobs in the subsequent session.

R: So you've really revised the workshop focus through talking to the project director.

Ex. 1: Yes. Initially, our conversations focused on "what can you do to these bilingual aides (she's a new project director)...but then we've been talking a lot over the last four months.. and I guess it was probably initiated by me, how we could incorporate some of the problems she was having into the workshop.

R: What were you thinking as you broached that topic with her?

Ex. 1: I was thinking that nobody changes their practice when they aren't comfortable with the work that they're doing. My thinking in wanting to look at the bigger picture... comes from my experience over the last six years of needing to have as many organizational factors in place and going smoothly before one can ask people can change their practice... and also getting caught so many times.. you know how you go into a situation to do a workshop and you find out... hey they don't care about whole language...what they care about is one person in their group is bad mouthing everyone else, or their

director isn't giving them any direction...

R: So it's that experience of having gotten caught a couple of times when you get into the workshop and you actually find out that what you planned for isn't what needs to be talked about.

Ex. 1: You see that on people's faces. Also, I really refer to, in my thinking, all the stuff about adults and how they learn...how adults come to learning situations to solve problems, how they want to solve the biggest problems first... the kinds of things she [the project director] was telling me were going on were basic organizational problems....It's an interesting thing to go through this process with a director... I really don't think that she [the project director] saw this at all until we started talking about it...

R: So you're at the point now where you're ready to start mapping out the actual workshop process, having done all this talking and thinking and trying to shape it previously and now you're down to the nitty-gritty of "I've got three hours to fill and how are we going to go about structuring this thing..." Are you in the planning process now?

Ex. 1: Absolutely... I'm trying to figure out what I have to have copied off.

R: How do you approach this? Do you approach this by looking at your time first, looking at your structure, or thinking through the needs and trying to match them up... What kinds of things are you thinking about?

Ex. 1: Well, probably a whole number of different things. One of the things I did was to call a friend to see what she had done in this particular context. She had done a lot of stuff with bilingual aides. I asked her for one of the handouts that she used and I talked to her about what we were going to do and just kind of talked things over with her. I'm also trying to think of ways ... of structures for the workshop in a real practical sense... like how many pieces of paper do I actually have to hand people to make them feel like they've had some structure to the time together... and to what extent can I

design activities where people will be talking in pairs or in groups where they will feel comfortable...to what extent is it important to have these two groups mix, as opposed to working in their own group... So I'm thinking about activities and I'm thinking about pieces of information for them... One of the things we talked about doing is starting out the session with some anecdotes of real dilemmas where a question arose from a particular dilemma... so I've been trying to think of some dilemmas and I've also talked with the director about some dilemmas... so I'm kind of pulling together... I do this in a very non-linear way.

I usually write down a bunch of ideas and I usually have several different things in mind for directions the workshop could actually go as far as the sequence of it.. So I'm kind of pulling in info and pulling in stuff to hand people and pulling together methods at the same moment.

R: And how is it that you decide what pieces of information that you actually want to include?

Ex. 1: Well, this time I collected some handouts and I sent them to the director and we talked them through on the phone... what pieces looked interesting... what pieces looked like things we could work with. I make a lot of decisions when I'm working with the bilingual aides based on how accessible are they... I want them to be very accessible English...while a lot of the aides are highly educated, with masters or teaching degrees from their own countries, a lot of them are undereducated for the roles that they're in... teaching chemistry, algebra, etc. So I try to have the written material be very accessible... that not be an issue at all. I also don't want to give people a lot of superfluous reading (because I don't think anybody does it) so I want it to be succinct and things that I could adapt to our particular purpose. But I also think that it's important to have some documents that people can walk away with because it formalizes the activity and for the aides, it professionalizes the activity for them. What I'm going to do this time, since we're going to be meeting six or seven times over the next four or five months, I'm going to be giving them folders to put this stuff in.

R: Why is it that you think that's important for them?

Ex. 1: It parallels the content.. the idea that this is our initial talk together, that what we're going to do today will form the basis of what we're going to be thinking about as we're going on... and I'm going to go back and refer to the things that we're talking about as we go on. I also would like the mainstream teachers to see the aides walk in with a packet of stuff that they've been thinking and talking about because I think it elevates the aides efforts. It's something I've been doing a lot with aides, is making sure that the aides are recognized to be working on their skills... It's something that's always in the back of my mind.

R: It sounds like you've come to these decisions over a period of time... How is this different from the first time you gave a workshop for aides?

Ex. 1: The overriding thing that I've learned is the fact that there needs to be some type of recognition that they do really hard work and that they're not recognized for that work... one of the ways I can do that is by treating them in overtly professional ways.. making sure that the title of workshop includes the words "bilingual assistants" or whatever their specific task is, 'cause they always feel like they're adjunct to everything... and making sure they have folders... and there's nice coffee and rolls... and the seating is nice - we're not just in the kindergarten room where the chairs are little, because that's the only place we could go, because if they were teachers, they'd find a spot. Those kind of symbolic things have just been surprisingly important. Content-wise, I've found that it's been important to work from acknowledging in some way, that they have theories about the things that they do.. I usually make some kind of statement during the workshop that "this may reinforce some of the things you believe, or it might stand in contrast with some of the things you believe, but I hope that as we talk about it you're thinking about the things that you believe. My intention in doing that is to reinforce to people I know that you really care about what you do, you may not think about it in such a formalized way as we're doing in this workshop, but I know that you do think about it, and what I'm trying to help you do is formalize your thinking in some way, so that you can talk with other people about it, so that you can criticize it and improve your practice in some way. There's a lot of PR work in what I do... and I really have changed in that way over six years of doing training. I see a major function of what I do

is to say to people like bilingual aides, "I know you're serious about your work, that's why we're talking together about it, so here's a way of thinking about what you do." Before, I was much more oriented to making sure that they understood a particular method... I still care a lot about that, but I know they won't even think about it [the method] unless some of the basic needs are met... actually much more than children..., 'cause children are used to people saying things like "SQUARE DANCE" or "HOLD UP ONE HAND" and they do it because they have to. But with adults, you just have to make sure that they feel valued and comforted and all those things.

R: Let's move back to planning for a minute...Talk me through how you're getting this stuff together.

Ex. 1: The initial pieces of the process are really important to me and they're probably most central to what I've done, which is I have lots of conversations with the director, I've done two site visits and I'm going to try to visit that morning too and make sure that I try to see most of the bilingual aides in the school. I've talked with the principal of the school and everybody's given me wildly divergent information...

R: given the fact that it is so wildly divergent, how are you coming to some decisions about what to select out of all this wildly divergent information to plan?

Ex. 1: Well, I guess that the actual workshop topic that we've decided on is the way I'm feeling comfortable with it... we're going to do is ask the aides to actually write down what they do, rather than relying on reports of the teachers, or the director... I'm sure that we're gong to end up having a lot of questions and in fact, my guess is that this is going to take two workshops, rather than just one, and that's OK. But that's how I'm dealing with the ambiguity is to turn the ambiguity into the activity... because if there's that much ambiguity there, it seems like a problem to me. And all of those wildly divergent people have characterized this as a problem.. I think five or six years ago, my orientation would have been to go "Oooh, I don't want to deal with that,"... now my orientation is well, we've got to deal with this.

As far as other processes, I'm kind of laying out a bunch of material I have and trying to think about a logical sequence. I want people to somehow feel we've come to some conclusions at the end of this workshop, even if we're going to continue it on another day, so I'm trying to look for a way of having people walk away with something in their hands that they've actually created... I'm thinking about the possibilities for cooperative talk that could go on, I probably have three or four different activities in my mind that will take place, if appropriate, during the time, and I'm going to have all the "stuff" ready to do those things, but my style is usually to be very much an instant decisionmaker about what the sequence of things is going to be, depending on energy level of participants, level of talk that's going on, intermingling that's going on or not going on, academic orientation versus the personal orientation and which direction that needs to be going, so I like to have an array of things to choose from.

R: So you seem to feel comfortable in taking a lot of cues about what's going to happen in the actual workshop structure from what's going on as you are in it.

Ex. 1: Yeah. I would feel very uncomfortable having a linear thing laid out from beginning to end... and that's probably sort of different from the way a lot of people like to do things.

R: Do you think that's a function of some of the experience you've gained over the years?

Ex. 1: Uh-huh, I do. Because of experience, I can be much more "present" in what I'm doing, rather than being concerned about getting through material or some goal I may have had in mind. I feel like I'm a better listener and a better leader/participant, so that I can make better decisions now, as we're in process... I think that before I didn't trust myself to make decisions in process because I wasn't nearly as aware of what was going on. I'm much more aware of what **might** happen if we do X... I'm much better at making those decisions in process.



R: Has anything else changed?

Ex. 1: I used to be much more oriented towards content... that sounds terrible because I'm still oriented towards content, but I had this feeling that was very unreasonable, I think, about how no one would understand anything that I was trying to say unless they understood it all, and unless I presented it all... and that meant every bit of theory and then all of the methods. I had to tell them every single theory and every single idea about language acquisition or else I felt like I hadn't done my job. My experience has been that there such a broad range of adult learners in the continuum of people, and the fact is that there not going to pull that much out of a workshop anyway, so I need to be selective, I need to read the group as much as possible and do the things that are most engaging and most applicable for the particular group. So I guess I am more attentive to the group than the content. That's been a big shift for me. Before, because I was not confident about my total mastery of the content I think that I was out to prove that I knew what I was talking about. I probably go in with a lot less stuff than I used to although I never, ever get through... People would probably describe me as "that person who comes and lays out all those overheads on that table behind her, and then uses three of them." It's like laying my brain out on the table so that I have something to refer to if I have a moment of "loss."

R: Let's go back to workshop at hand for a minute... You've got all this stuff sitting out in front of you, all your materials in front of you. How are you choosing what to include and what not to include?

Ex. 1: I'm thinking about time, being very practical. I'm thinking about the political scene, what kind of less controversial thing could we start with that would develop trust so that we could about the real issues... and for me that means what could they do individually that could then be shared with one person, then could lead into a small group discussion, so to gradually ease into this idea of talking about their jobs. I'm doing a lot of thinking about the practices of these two particular cultural groups and the language skills of the two groups. They have a number of tutors who are students at the university and they're college students who are used to being in an environment where

everybody throws their two cents in, so I'm trying to think about these activities in a way to not let them take this over out of their wonderful enthusiasm. And again, this is a product of experience. I'm going back and forth in my head between content and activity, participants and what's going to work...and I haven't really come to any conclusions yet about this. But I have to say, that I just opened this stuff up to get everything ready and probably in an hour I will have this all wrapped up, cause a lot of it does happen for me, prior to putting a handout together... It's much more "big picture stuff."

I like to think about what people would say if they walked out the workshop and someone asked them, "Oh, what was all that about?" I actually like to think about what they would say...that's a guiding principle for me. I try and think about how the activities I ask them to participate in would turn into the statement they would make to answer that question. I think those are very telling statements...while I like to think that people are learning something in a workshop, I also think it's more realistic to think that they're learning more "big picture" stuff than small stuff. One other element... while I'm trying to design more workshops so that they're not just "one-shot," I think that in one-shot workshops there's a lot more "winning over" of the group that I would do. That would actually be something that I would think about, whereas with this group, since I'll be with them for not only six sessions this year, but for the next two years at least, I'll definitely think about what can we do to establish trust because that's just seems to be the key to everything.

R: How have you come to this understanding?

Ex. 1: I've taken some course work on this... I've done some serious reading and thinking about this... It's partly experience, though, in my having a wider array of interactions with teachers through a lot of time spent in the schools. I've also learned a lot of key things to say, which sounds very formulaic, but you know how you have to build credibility with people fast, there are some key things to say that I probably pull out in various places...I've stopped feeling guilty about that.

Like, last week I had a workshop and I was told the crowd was going to be hostile and I did this thing where I asked them for names of participants before the workshop. I called them and I talked to the principal too and asked them what

they wanted to talk about at the workshop which probably saved my skin, but it was clear to me immediately from their faces when I walked in that I needed to do a lot of talking about my experience as a high school English teacher right from the start. But I wouldn't have known that if I hadn't done a lot of workshops previously with high school people. .. So much of this workshopping thing has to do with building an instant relationship.

Ex. 1: Usually I plan an opening statement and I plan a closing statement... and I usually make a statement about how the workshop will be structured. I usually make sure, and I rehearse this... if I'm doing an activity, I rehearse how to tell people how to do it, because you have to give very clear systematic instructions if you want people to do anything cooperatively. That's another thing I do in the car...car time is invaluable. I usually have an hour's drive to anywhere I have to go. Overheads or handouts are cues for me. Handouts have big numbers on them, so we can go easily from page to page. That's something I've learned too...it's so funny though; that's the kind of things that makes all the difference. Sometimes I'll walk through the handouts beforehand and write in reminders of stories or anecdotes I want to tell in particular places, but usually I'm so caught up in things I don't refer to them.

R: Do you feel like you've talked through the process that you normally use to plan?

Ex. 1: There's one other thing which I alluded to earlier that deals with trying not to do "one-shot" workshops. I always try to build something into workshops now that is some sort of follow-up. It usually has something to do with what the director is going to do with her staff, since I can't usually go back and do the follow-up myself. I haven't figured out what to do for this one yet. That's another element that I would include as part of my normal planning process.

## Think Aloud Interview with Expert 2

Researcher: Tell me a little bit about the workshop you're going to be planning for.

Expert 2: OK. This workshop is one I'll be giving tomorrow. It hasn't been the type of workshop that we're usually asked to present in that it's part of an on-going program that the district is putting on. The district happens to be a very, very large district in Southern CA. They have been working very hard to meet the needs of an increasing number of LEP students and to prepare staff. They really want to find out about funding sources to assist them, but more importantly how to implement an Title VII instructional program so that it will be more effective.

R: So the topic is funding sources and implementation?

Ex. 2: Well, like more like what kind of commitment it takes and what is capacity building or staff development for these types of programs. "What does it all mean?" is the question that they're asking me. And then secondly, give me practical applications to put it all into perspective of what it means for my teachers and how I can go about doing this. So that, in essence is about the amount of information that you are given. And they send you an agenda and it shows an amount of time you are given [for the workshop]. And to cover something like that is a work in process and it's better over a period of time, but you have 45 minutes, and they've brought in their superintendent and a couple of other people because you're going to go and present for them. I think it's a group of people (like 40) in the group.

When I first heard about it, I realized I had about two weeks [to prepare] and that one week of that time I had to be out of town, so I only had one day to think about and get it begun before I left...you know, handouts and overheads and that type of thing. Now that I'm back, I've picked them up, and I'll have go back and touch base and put on my thinking hat as to where I was at the point when I prepared the materials initially. So that's where I am this morning. I have my packet. I've picked it up. I need to have this kind of demographic thing...because for Title VII projects, capacity building or staff development, I think, has a dual focus: one is to get the teachers who are working with those students

prepared, but always it's more teachers than you can release at one time, so then you have to schedule how you're going to begin the process, and which ones get released; the second focus is how they [the teachers who have received the workshop] can come back and assist and share with the others so that it makes it [the staff development program] feasible.

R: Since you say you have some materials that you've gathered together, it sounds like this is a topic that you may have presented on before. Is that the case?

Ex. 2: Well, you know being in capacity building and staff development and doing training, very often, what groups ask of you is requested at different points by different groups. But for this particular district, I would want to have demographics from this district. So although you may have prepared some of the material before, when you say I'm going to include demographics, it takes time to find the information, and decide how to present it.

R: You say you have a packet of materials with you right now. What did you think about as you initially decided to pull those particular materials together?

Ex. 2: Well, I know that I'm going to have quite a spectrum of people that have understanding about the topic or expertise in the topic, so I like to begin from a very common point so that our vocabulary and the rest of the few minutes that you have with them will be meaningful. I generally begin by saying "let's look at what's happening to bilingual education, let's start from that focus. And that's when I share with them, the fact that the staff development component of Title VII needs to have two goals: to prepare teachers who will be working with students and recognizing that the needs are such that you can't do it all at once. You want to plan a program where teachers are really going to develop the skills and the expertise to actually implement the new methodology. So, for example, if they're going to be focusing on cooperative learning, you would not just have them know a few cooperative structures, but you would have them understand the rationale of when to use cooperative, why and then a few examples, so they can really implement. And if you're asking them to change methodologies where the management of the classroom or the way

they plan their lessons....

Let them know that there are models for staff development. One model that I'm going to talk to you about is a collaborative model.

If you can plan collaboratively with the people who will be receiving the services, then the program will address the specific needs and they will be much more excited and but into it, if they've had an opportunity to say this is what I need.

Next I begin to talk to them about the specific components. One is the planning stage...and I have some overheads on the planning stage, but I have a lot them... so when I say I have this packet, I mean that I have several overheads and when I actually begin to put it [the workshop] together, I then go back and decide which ones to use as a handout.

R: And how do you decide which ones to use? What are you thinking about as you make those decisions?

Ex. 2: Okay, now I have my packet. And then I look at it and I see that they sent me this agenda, it looks like I have this amount of time. And then I look to see who's presenting before me and who's presenting after me, so that what I choose will match or fit in or integrate. Then I recognize that I need to have a little bit more information. (Like when I started to plan I realized that they hadn't told me the number of participants, so I called the district contact person and as I talked with her, I told that I wanted to get some clarification on some things and I shared with her a few of the options and see if she had a preference. I took two pages of notes as she talked. I'll look at my notes, compare them to the packet I've already pulled together, and adjust from there. The other thing is that I'll be the only consultant presenting on this day who will be new to the district. The others, who have presented previously have also worked together in preparing their workshops.

R: So this workshop is part of a on-going series... where does it fit in the sequence?

Ex. 2: It's number four of a larger series. I've talked with one of the consultants whose presented previously and asked her to look over my materials to see if there were some that

were more relevant than others, based on her experience, particularly any that would tie in with what had been presented before or where we ultimately want to take the group, please tab them for me. The materials she marked will also be incorporated as I make final selections of the material I'll use. I feel good because she left me a note saying that all the materials were excellent and to just select those I felt were key. So, overall, I know the workshop is hitting the mark. Now, what will finally determine the materials selected will be more the amount of time that I have and how to put it together. Actually, now that I look through the packet I see a note that I wrote for myself before I had much information. I had written "demographics" and a note that I want overheads of that... and I see that I had only selected three things as possible handouts. So I have it more pared down than I remembered. I asked one other person who had worked with the district what he felt would be most helpful and he said,

"Rather than do overheads and handouts, you should talk to the group from the heart and from experience. Then, you should do a needs assessment with them to determine common needs, so that as you start the workshop, you can share the results of the needs assessment with them. That way, they'll know that you heard what their needs are. By doing that, you'll be modelling for them what you'll be presenting... that is, you'll reinforce the notion that effective staff development programs start from stated needs."

R: You've shared with me that you've gotten input and feedback from a number of different sources. What are your thoughts as you sift through the information that all of these various sources have given you?

Ex. 2: When I think about modelling, I think that's very important. Then I look at the block of time and the needs assessment instruments I have on hand and go from there. I feel that the best thing [to do] is give a little talk and model a lot by doing the needs assessment. But I don't want to do the needs assessment if this workshop is the last of their series. If they have one more, where I can take the needs assessment information back to them, then I will emphasize that.

R: At the beginning of this think-aloud, you said I know that the people I will be meeting with have expertise in this area, and I wondered how it was that you knew that.

Ex. 2: You know, as I said earlier, this district previously had Title VII projects, and this year I think they have eleven...so I know that they've been working very hard and that they're very serious about what they want to do... I know that they value this a lot. That gives me the idea that they're not new to this.

R: How is it that you prepare yourself... What kinds of things do you think about as you gear up for this?

Ex. 2: I try to look at the student population, because if you're going to be successful, you have to be in tune with what's happening in the district. So if I'm going to be talking to be talking to parents, I visualize the parents, and I visualize the things that have worked and the types of questions parents generally ask... I think about myself as a parent and the concerns that I have as a select materials for the workshop. For this group that I'm preparing for, I try to visualize them and see what's worked before and put myself in their place. I begin to decide what is the best way to empower them to do what they want. As I look at the agenda, I see that I'm on after lunch... probably you can hear in the tone of my voice that brings up some flags... now that I see this, maybe I need to do a little bit less talking and little bit more doing, so that they're engaged.

R: So then lunch immediately sets off some bells in your head and influences how you plan?

Ex. 2: Right. You know, what activity I'll do first and how much of what. So after lunch it's better to do just a little talking and then immediately get them involved, and then go back to talk, cause otherwise it lulls them to sleep. You can't put them into an activity right away, because they're unfocused....some of them have gotten lunch, some of them haven't cause they've been making phone calls back to their offices to find out what's been going on. After lunch it's even more important to get them focused. That means that I'll



have about ten minutes to talk, give them 15 or so minutes for an activity and then have a few minutes to sum up.

R: So how is it that you select an activity for that 15 minute activity period?

Ex. 2: I know that I want to get focus... so talking about them would be the most immediate thing to do. If you talk about their district, it brings everything into clear focus and relates directly to their needs. I also want to let them know that even though their district is facing a big challenge, there are many effective strategies and procedures that will be helpful to them.

R: You said that one focus of this workshop was to give them practical applications. What are you thinking as you select the applications you'll eventually talk about?

Ex. 2: Since I want to model for them, I'll choose an application that allows me to do that. That's the reason I like the idea of doing a needs assessment so much. Since I'll be talking about setting up staff development programs, I can show them the function and relevance of the needs assessment...how needs assessment has practical application to staff development and to planning for future sessions. That's probably the way I'll select the activity for this workshop. So does it sound to you that's it's going to.... Do you have any suggestions?

R: No... and I shouldn't have any suggestions, because that's not what I'm here to do. (Laughs).

Ex. 1: But this is not a role play... this is what I really do [ask people for suggestions].

R: Well, I'd love to hear about how it goes after you give the workshop... maybe we could talk afterwards....Let me put it back on you for a minute. Do you already have a sense of how this is going to go?

Ex. 2: Well, I know which needs assessment instruments I have and how long it generally takes people to fill them out, and even though they're not perfect, they serve the purpose. Also, the fact that the needs assessments instruments are not perfect allows me to model the fact that you don't have to wait until you have a perfect instrument to do staff development, that just the process of giving people a chance to have input is the important thing. [Describes some of the instruments]... Another thing that impacts a lot on this is that I will have to leave at 5:00 in the morning to get there and I have a long way to drive and uncertain traffic conditions..that in itself makes me select things that I can immediately put together and have a little time to reflect on before I begin the workshop.

I really like to be creative, I like to make each workshop specific to the particular group, and I love to be able to do the work-up work of the workshop.

R: Think aloud with me about things that you think you might do to make this workshop a little more creative and to tie it to the specific group that you're working with tomorrow.

Ex. 2: You know, I feel that in terms of my thinking processes, that when I say the work of it, that's the time limit, the material you already have, the givens... But the other part of it, like what that person said to me about using my "heart" and practical experience, that's where the creative side comes in, and why I've decided to use the modelling ... you know, letting them know and see that staff development is something that is something that is constantly evolving and changing and improving. That element seems to me to be from a different dimension than the "work" side of it; more creative.

R: And what are you thinking about as you decide what you're going to say?

Ex. 2: I first think it through on the "work dimension" and then I go back and plug in the creative side. I try to reflect on the kinds of issues affecting the participants, and find ways of highlighting their accomplishments. For this workshop, I'll try to plan for both the work and creative dimensions. I'll arrive early, so that I have time to hear what they're doing prior to my presentation. That information will help me

make a final decision of what to stress during my workshop. I'll observe the participants during the first part of the workshop... actually, some of the planning I do takes place during the workshop itself, when I'm listening and observing.

R: What are some of the things you'll be observing for that will give you clues about additional adjustments you'll be making?

Ex. 2: I see from the agenda that the district sent me that the first activity the participants will be engaging in is "feedback from previous meetings" ... by listening to them, I'll get an idea of what they've done previously, what they've already accomplished or learned. Secondly, they're scheduled to discuss parent involvement. So I'll get to see the type of commitment they have, the type of support that parent involvement enjoys. That will tip me off about the kinds of notions participants will probably also have about staff development. The third item on the agenda is quality of personnel. All of these things show me that they're talking generally about all the components of successful projects, including staff development and capacity building. The fact that we will break for lunch before my presentation will allow me to think about what I've heard in the morning and readjust things to make them more meaningful.

R: Do you ever go to a workshop where you don't have access to this type of information because you're the first one up?

Ex. 2: Yeah. Often. I didn't know where I would fall on this schedule prior to receiving the agenda.

R: How do you readjust then?

Ex. 2: Then I try and provide them with more time to focus and also provide them with more background information. I also try to relate the background information to the participants by sharing first, then asking "and how many of you have had this experience?" That gives me a little better feeling for the audience as I present. I also tell them what my background is and how it relates to the topic we'll be discussing.

R: Do you feel like what you've told me represents your thought processes?

Ex. 2: Well, I've never done this type of thinking aloud before... so it's hard for me to tell. Plus, I know I'm being taped, so periodically that flashes in my mind a little... but I know that working with the people that have made the request for the workshop is something that I consistently do. Also, for me, I try to make workshop planning a kind of "living process," a part of whatever I'm doing. For example, when I saw the man who told me to speak from the heart, I hadn't really planned to ask him about the workshop... it's just an automatic process to get input from others who have worked in similar contexts or related situations or others who train as I plan...like I even asked you. I'll probably be much more conscious of my own planning processes as I plan the next workshop, whether it's a similar or different situation, just because of having talked through this one.

R: Is there anything else that you'd like to tell me about what you're thinking as you plan for this workshop?

Ex. 2: Well, tonight, I'll probably put the whole thing together, and tomorrow as I'm driving there, I'm sure I'm going to be reflecting on the things I've selected to do and getting it very clear, so that by the time I'm listening to people talk, I will have done a lot more planning and refining.

## Think Aloud Interview with Expert 3

Researcher: Why don't you start by telling me a little bit about the workshop you'll be discussing.

Expert 3: This particular workshop, which I planned and delivered two days ago with another trainer was targeted at a group of about twenty science teachers, some of whom were bilingual, some were monolingual English speaking teachers who all served limited English proficient students and the project is focused on science. Our goal was to sensitize these teachers to language issues as they impact on science teaching. The larger context for the whole project is that the teachers are there for an entire weekend, from Friday to Sunday, and they were heavily embedded in scientific experimentation and scientific inquiry, and discussion around those issues. We were asked to be there to observe the process and to participate along with them. What we did was... we had preplanned what we had wanted to do... we had sketched out what we wanted to do with the group as far as what we felt were some of the critical language issues were in teaching science content.

R: So you and the other trainer did that together?

Ex. 3: Yes, we did that together. So we did some preplanning, given what we knew about the audience, given what we knew about the project. However, our goal was to participate with the teachers during the other parts of the weekend because during the process of interacting as members of the whole group, we would maybe reconfigure our workshop and re-think some of the issues that we wanted to present and in fact, that's exactly what happened. So that gives you a sense of the goal and how we initially approached the project.

R: So, you knew going into it that you might wind up reconfiguring?

Ex. 3: Absolutely. That was actually part of the plan...and we built in time for that kind of planning.

R: Tell me a little about what you were thinking as you went through these planning processes.

Ex. 3: Usually, when we [the other trainer and I] plan things like this together, we go and sit together and we think about "what is the critical issue here?" I like to get confirmation from the person who has contracted with us for the workshop... to know what is it that they want these teachers to go away with... what is their end goal, be it an overt goal or a covert goal? Once I get clarity about that and I know who my audience is.. and that's important... to know who the background of the teachers, their experience with language minority students, their bilingual ability, etc., once I get a profile of that audience and I know what the contractor's intent is, then either I do it alone, or in this case I did it with other trainer, we sit down and we talk about, "Well how do you think we should go about this?" I think the two issues are important... at least I divide up the discussion in two ways: what is it that I want them to know and secondly, how do I want to get them to that point, because I don't see this as simply imparting information. We were talking as much about process as about content. The first time we meet, usually we're so hurried, and we simply say to each other, "OK, these are the parameters of the task, this is more or less what we want to do, you go home and I go home and let's think about five principles that we want them to go away with. We do that individually. And I would do the same thing if I were to plan independently. What five points do I want them to arrive at, or what five skills do I want them to develop by the end of the session... and that, then, becomes my point of reference as I plan the process that's going to get them to those skills or pieces of information.

R: So you're constantly going back and forth between planning for processes and content?

Ex. 3: That's right. The processes I don't even think about. You know, once I separated from the other trainer, it was simply, let me pick out concepts that are critical to their [the teachers] being to integrate language development with concept development. So we did that and she went back and I went back...

I jot down everything I can think of, you know little notes, and I pull from here and there and I have ideas and

points that I want to stress. She wound up coming back with a videotape that she felt exemplified some of the principles. In effect, that became her contribution. And then we met together and we viewed the videotape. And then we looked at the principles that I had written and we thought about how these two things could be woven in together. How could we cover this content, how does this videotape fit in and how do we engage the students initially, how do we grab their interest? The first piece is so important, cause that is where you either get your audience or lose them.

We wound up knowing that the film would be close to the end; we knew that they [the teachers] would see one segment of the videotape, then they would discuss it. They would see another segment and discuss it. We didn't want them to sit more than ten minutes at one viewing. We didn't want the tape to consume the presentation....it was a two and a half hour presentation.

R: So you came to some decisions about how you would structure what would go on in the workshop. What were you thinking as you came to those decisions?

Ex. 3: Yes. One thing was movement. We didn't want them to just be sitting there and get information and somehow the videotape was a visual that would break up either strict discussion or strict lecture or any combination thereof, so that it was involving them a little more passively and it enabled them to put together some of the things we would have presented earlier. We talked about whether we should show the videotape earlier, but we wanted them [the teachers] to have a little background information and we wanted to use the tape, rather than to be instructive, to be summative....and then we would pursue the discussion even further. We chose the tape because it brought the teachers into the classroom, so they actually saw science classes being taught [on the tape].

R: Why was it that you thought that was important?

Ex. 3: Because too often the teachers wind up just hearing theory and we knew we wanted to cover theory, we knew we had some points we wanted to stress, but they wind up hearing theory, and somehow the application, when it's put at the end, we never get to it. This was a way of assuring that we would

go into the classroom.

I should pull out my outline... I brought it in today.

R: As you look at your outline, do you remember what you were thinking as you jotted things down?

Ex. 3: We talked a lot. I had listed certain ideas, like the importance of culture in teaching science and the importance of prior knowledge and experiences kids have had that are scientifically based. We talked about, negotiated, what is the role of language in learning, how do kids process concepts and new ideas... It became a conversation for the other trainer and I. As we conversed I think we kept synthesizing until we got to the point where we got to five principles that we could actually write on the board.

R: Do you think that the way that you planned for this workshop is representative of how you plan for others?

Ex. 3: Yes and no. When I plan alone, I don't have the luxury of bouncing ideas off of someone else. I love going through it with someone else. I think it helps me to crystallize my thinking and I just think it's stronger overall. When I do it myself, I wind up writing a very sketchy outline, the points that I want to stress (I do that on one page and it goes on the computer) and then I start thinking, OK, under this item what can I do to bring them to this point. Very often the principles are phrased in questions. In effect it is a little different, because I start out with a more succinct outline, a real outline, then I start then developing more. When I planned with the other trainer, I didn't start with an outline, per se, but just some ideas.

R: You talked about interacting with the teachers and reconfiguring the workshop outline. What were you thinking as you reconfigured?

Ex. 3: Once we had decided the placement of the video... we had the end, we had the next to the end, and we had the principles... We didn't have the middle. We had ideas, but we



just didn't know how we were going to do it. I think part of the problem was that we didn't really know how much these teachers really knew. I didn't have strong sense of them. So when we [the other trainer and I] went in to participate in the science

activities with the teachers, we decided to focus on how they were using language in the process of participating in the workshop, what questions they raised and then we decided we would meet after the session. So at 9:00 at night, we went back to the hotel and met for two hours. And then we started thinking, this approach [the approach the science teachers were already using] is so dynamic that we don't really deal with issues of changing from teacher-directed lesson to a student-directed lesson in our workshop, because these teachers are already using interactive learning. And they were doing it, so there was a lot we could eliminate in our discussion. The two of us, however, had come with a whole host of possibilities of things we could do. I had brought a file with a possible handout I could use, and the other trainer came in with overheads and transparencies... we had gone through our independent files for things we could plug in, depending on what happened Friday night. As we met, we kept trying to come down to four critical points. We still hadn't defined the process, but we knew that if we slept on it, it would be fine. At 6:00 AM, I got up, and I had it. I get these brainstorms... I had decided these are the four points. The other trainer and I had talked about them so often, so I guess it was a matter of crystallizing and getting some distance from it. That does happen to me... I usually crystallize very close to presentation time... bringing it all together comes down to the wire.

R: What are you thinking about as all of this comes together for you?

Ex. 3: Among other things, it's how do I keep the audience engaged and involved; what kinds of questions can I raise with them. It's never about giving them information. That is not what training (for me) is about. It's about getting them involved in the process, and making them come to the realization of where I want them to go. I know what I want them to go away with... the more critical piece is how to get

them there, what kinds of questions can I engage them in, and what kinds of charts can I use to help them synthesize their thinking. The other trainer and I met an hour before we were supposed to present and...oh one other thing... a decision the other trainer and I had made was that we wanted to give the participants a handout. That was one decision we made early on.

R: What were you thinking as you made that decision?

Ex. 3: Well, people will take very different kinds of notes. I'm not so sure that they'll get everything that I want them to have in their notes. Somehow, the handout guarantees that they're all going away with one consistent piece of information, and it isn't just the notes they've taken which may be very different. Very often, I'll give them an outline of the questions we'll be discussing... it's an organizer for them. In this workshop, we did the organizer on a transparency, but I always do use some kind of organizer.

Going back, the final decision we made that morning was to give them some kind of pre-organizer... some kind of opportunity to think about, to reflect on what they had done the night before, connecting it to language. We decided on a quiet reflection to let them think about the implications of what they had done the night before for second language learners. And then, the second part, we wanted to engage them in discussion. I mean, the whole point of what we wanted to talk about with them was that the teaching/learning process is interactive. For us to come in and start lecturing seemed ridiculous. We wanted to model the kind of teaching we want them to use.

So the second activity we decided on was a whole group discussion. The question was, "How different do you think the responses of second language learners would be from your responses as adults who are proficient speakers of English?" Our focus was to get them to think about the differences that they might encounter as they tried to implement the activities from the night before in their own classrooms. We were trying to make the connection between what they had been able to accomplish using interactive science and what the kids might be able to do. The idea was to move from whole group to smaller group discussions of this question where the participants would do a more in-depth analysis. The question

for the small group was "Analyze two activities that you did last night and determine which would be most and least difficult for second language learners. Next they were to analyze the parts of the activities they named in the same way. To save time (because I've found that when you give people too many choices, they spend time making choices and not discussing) we told them which activities to focus on. They had ten minutes to discuss, and reported out. It was interesting because we found that even though they didn't choose the same activities that the other trainer and I chose as difficult, they had excellent rationales for their choices.

That's why the conversation was important - to see what the discrepancies were, and to have them think critically about what they're doing with kids.

That became the first half hour (which turned into the first forty-five minutes). Then we moved into providing them with an overview of the rest of the workshop which consisted of a discussion of four key concepts, next the viewing of the videotape, and finally, the application section of the workshop which was small group work which asked them to modify what they had done yesterday to make it more meaningful for second language learners. So the workshop was supposed to go from theory to application to practice. And by the way, that is a mode that I always present in; those three parts. Because the time was so short, we modified right there on the spot. We showed the participants our overview and asked them which part they would like to eliminate, given the short timeframe. They chose the discussion of the key concepts. I was very uncomfortable with that. So I said, let's compromise. Let's put the key concepts up and have you choose two that you want to explore more.

R: How did you plan for the discussion pieces, where you did the mini-lecture?

Ex. 3: Through the discussion that the other trainer and I had the night before, and the discussion that we had the week before even meeting the teachers. These were the issues that kept coming up for us. We decided that we wanted to use teacher language. But the pieces were arrived at through a constant negotiation and discussion. We must have met two or three times before we met the teachers, and then Friday night after the science activities, and then Saturday morning.

And here's something that I do in all my workshops - each key concept gets put on one page as an organizer for me. And as I think of things and ideas I want to stress I just jot them down and then I organize them later. It's sort of like just freeing my mind of everything that's related to that idea that I think teachers need to know.

And then we viewed the videotape which provided for wonderful discussion and really synthesized everything. In fact, the organizers said it was almost like we had planned the whole thing together because everything really did flow.

R: And what were you thinking as they said "it's almost as if we planned this together?"

Ex. 3: That there was synchrony in our perspectives about the teaching and learning process.

## VITA

Denise McKeon was born on July 30, 1947, in Bronxville, New York. She completed her Bachelor of Arts degree in Spanish at Florida State University in 1969, and her Master of Science degree in Foreign Language Education at Florida State University in 1976.

A former English as a Second Language and Bilingual Education teacher, Ms. McKeon worked as a teacher trainer and Assistant Director for a federally funded regional training center for 12 years. She has also served as a Research Associate with the National Clearinghouse for Bilingual Education.

Ms. McKeon has written and edited books and articles on Bilingual Education and English as a Second Language. Her most recent book (co-edited with Katharine Davies Samway) is Common Threads of Practice: Teaching English to Children Around the World, (TESOL, 1993).

Denise E. McKeon