Nontraditional teachers: Personal learning styles and teaching styles

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NON-TRADITIONAL TEACHERS: PERSONAL LEARNING STYLES AND TEACHING STYLES

by

Teresa Delgadillo Harrison

A dissertation submitted in partial fulfillment of the requirement for the degree of

Doctor of Education

in

Instructional and Curricular Studies

Department of Instructional and Curricular Studies
University of Nevada, Las Vegas
April, 1997
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ABSTRACT

Growing numbers of career change adults are entering alternative certification programs to become teachers. These adults bring to the classroom many of the same characteristics of traditionally-prepared teachers. They also come with some unique characteristics, among them age, reasons for entering teaching, prior career experience and well-developed personalities that include learning preferences.

This study conceptualized non-traditional teachers as mature adults, persons whose personality types and learning styles preferences had been well developed and also reinforced by their previous career choices. The study explored the effect of non-traditional teachers' personal learning styles on their teaching styles. Four participants for this multiple-case study were identified through the use of the Myers-Briggs Type Indicator. Each participant chosen for the study was representative of one of four learning styles quadrants based on the 16-type MBTI. Observations and interviews were used to gather data from the participants and their supervisors using the methodology framework of Yin (1991), and the methods of qualitative data analysis developed by Lecompte and Preissle (1993). In addition, videotaped teaching sessions were viewed and coded by the researcher and a peer for triangulation.

Consistent with previous findings on the relationship between teaching and learning styles of traditional teachers, this study found that non-traditional teachers tend to select instructional strategies and media that support their
preferred learning styles. They do so regardless of other influences such as administrative support, availability of resources, and educational coursework. They were found to comply with school district and school curriculum mandates in ways uniquely their own, again, drawing on their preferred modes of learning to plan curricula, teach and assess.

The findings suggest that learning styles are an important consideration for teacher educators. Not only is it important for teacher educators to consider prior experience and learning styles in developing teacher education courses, it is also important for them to communicate the impact of personal learning styles preferences to preservice and inservice teachers for their future work in the classroom.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>iii</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>viii</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>ix</td>
</tr>
<tr>
<td>DEDICATION</td>
<td>x</td>
</tr>
<tr>
<td>PROLOGUE</td>
<td>xi</td>
</tr>
<tr>
<td>CHAPTER 1 INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Background</td>
<td>2</td>
</tr>
<tr>
<td>Research Questions</td>
<td>6</td>
</tr>
<tr>
<td>Theoretical Framework for the Study</td>
<td>6</td>
</tr>
<tr>
<td>The Setting</td>
<td>14</td>
</tr>
<tr>
<td>Significance of the Study</td>
<td>16</td>
</tr>
<tr>
<td>CHAPTER 2 REVIEW OF RELATED LITERATURE</td>
<td>18</td>
</tr>
<tr>
<td>Historical Perspective</td>
<td>18</td>
</tr>
<tr>
<td>Personality Type Theory</td>
<td>23</td>
</tr>
<tr>
<td>Learning Styles</td>
<td>28</td>
</tr>
<tr>
<td>Teaching Styles</td>
<td>33</td>
</tr>
<tr>
<td>Selection of Instructional Strategies and Media</td>
<td>35</td>
</tr>
<tr>
<td>Impact of Beliefs and Prior Experience</td>
<td>39</td>
</tr>
<tr>
<td>Non-Traditional Teacher Characteristics</td>
<td>43</td>
</tr>
<tr>
<td>Summary</td>
<td>46</td>
</tr>
<tr>
<td>CHAPTER 3 METHODS</td>
<td>48</td>
</tr>
<tr>
<td>Research Design</td>
<td>48</td>
</tr>
<tr>
<td>Definitions</td>
<td>49</td>
</tr>
<tr>
<td>Research Questions</td>
<td>51</td>
</tr>
<tr>
<td>Study Phases</td>
<td>52</td>
</tr>
<tr>
<td>Phase One: Sample</td>
<td>52</td>
</tr>
<tr>
<td>Phase Two: Initial Interviews</td>
<td>57</td>
</tr>
<tr>
<td>Phase Three: Observations and Validation Interviews</td>
<td>58</td>
</tr>
<tr>
<td>Phase Four: Data Transcription and Coding</td>
<td>61</td>
</tr>
<tr>
<td>Phase Five: Data Analysis and Triangulation</td>
<td>62</td>
</tr>
<tr>
<td>Phase Six: Reporting</td>
<td>67</td>
</tr>
<tr>
<td>CHAPTER 4 Art and the No-Teeth Bar</td>
<td>70</td>
</tr>
<tr>
<td>Personality Type</td>
<td>71</td>
</tr>
<tr>
<td>Career Choice Data</td>
<td>75</td>
</tr>
<tr>
<td>Learning Style</td>
<td>78</td>
</tr>
</tbody>
</table>

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Teaching Style ................................................................. 81
Other Factors Influencing Teaching .......................... 92
Summary ........................................................................ 97
Conclusion ................................................................. 102

CHAPTER 5 Case Two: Barb and the Baseball Stats .......... 104
Personality Type .......................................................... 106
Career Choice Data ...................................................... 109
Learning Style .............................................................. 113
Teaching Style .............................................................. 117
Other Factors Influencing Teaching ............................ 127
Summary ........................................................................ 132
Conclusion ................................................................. 136

CHAPTER 6 Case Three: Carl, the Candy Man ............... 139
Site ................................................................................ 139
Personality Type .......................................................... 143
Career Choice Data ...................................................... 150
Learning Style .............................................................. 153
Teaching Style .............................................................. 155
Other Factors Influencing Teaching ............................ 165
Summary ........................................................................ 168
Conclusion ................................................................. 173

CHAPTER 7 Case Four: Doris and the Open Door ............. 175
Personality Type .......................................................... 177
Career Choice Data ...................................................... 180
Learning Style .............................................................. 184
Teaching Style .............................................................. 186
Other Factors Influencing Teaching ............................ 195
Summary ........................................................................ 200
Conclusion ................................................................. 205

CHAPTER 8 DISCUSSION OF FINDINGS AND RECOMMENDATIONS .... 209
Part One: Introduction .................................................. 209
Part Two: Findings ....................................................... 211
  Question One .............................................................. 211
  Question Two .............................................................. 220
Part Three: Recommendations ..................................... 225
  For Further Research .................................................. 225
  For Practice ............................................................... 226
  Postscript ................................................................. 229

APPENDIX A MBTI Form G Cover Sheet ......................... 231
LIST OF TABLES

Table 1  Personality Types Identified by the Myers-Briggs Type Indicator.............9
Table 2  MBTI Learning Styles Quadrants...............................................................10
Table 3  Quadrant View of MBT............................................................................55
Table 4  Participant Summary.............................................................................57
Table 5  Classification of Instructional Events, Strategies and Media
        Used in Classroom Observations...............................................................60
Table 6  ISTP Career Choice Samples.................................................................76
Table 7  Checklist Summary of Case One Instructional Strategies
        and Media.......................................................................................................84
Table 8  Examples of Learning/Teaching Styles Data for Case One......................103
Table 9  ENFJ Career Choice Samples.................................................................110
Table 10 Checklist Summary of Case Two Instructional Strategies
        and Media......................................................................................................119
Table 11 Examples of Learning/Teaching Styles Data for Case Two ......................138
Table 12 ENTP Career Choice Sample.................................................................151
Table 13 Checklist Summary of Case Three Instructional Strategies......................159
Table 14 Examples of Learning/Teaching Styles Data for Case Three.....................174
Table 15 ISFJ Career Choices.............................................................................181
Table 16 Checklist Summary of Case Four Instructional Strategies.......................188
Table 17 Examples of Learning/Teaching Styles Data from Case Four.....................208
Table 18 Participant Personality Types and Strength of Preferences.....................212
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1</td>
<td>Peer/Researcher Triangulation for Case One</td>
<td>65</td>
</tr>
<tr>
<td>Figure 2</td>
<td>Peer/Researcher Triangulation for Case Two</td>
<td>65</td>
</tr>
<tr>
<td>Figure 3</td>
<td>Peer/Researcher Triangulation for Case Four</td>
<td>66</td>
</tr>
<tr>
<td>Figure 4</td>
<td>Reconciled Data from Case One</td>
<td>66</td>
</tr>
<tr>
<td>Figure 5</td>
<td>Case One Summary</td>
<td>97</td>
</tr>
<tr>
<td>Figure 6</td>
<td>Case Two Summary</td>
<td>126</td>
</tr>
<tr>
<td>Figure 7</td>
<td>Case Three Summary</td>
<td>168</td>
</tr>
<tr>
<td>Figure 8</td>
<td>Case Four Summary</td>
<td>200</td>
</tr>
</tbody>
</table>
DEDICATION

With deep gratitude:

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To the most significant teachers in my life who inspired me to become a life-long learner: Sr. Mary Benedict, OP, Sr. Marion, IHM, Ph.D., Sr. Corita Kent, IHM, Ph.D., Joe Feehan, Dr. Fallon Evans, Dr. Beverly Firestone, David Meier and Dr. Otto Kroeger;

To my spiritual mentors, William Wilson and Dr. Robert Smith.
The time was 1961, on a warm June day in Los Angeles. The setting was the faculty lounge at the girls' high school where I taught. Present were most of the faculty who had spent the afternoon reflecting on the school year with the principal.

Six of us were new faculty and we were considered rebels, already having won a philosophical battle related to tracking. I was describing to the principal how I helped the "D group" students, the lowest group in this tracked school, achieve the curricular objectives for higher track students. That semester she had finally agreed that we could all assign higher grades than C or D to these students, if they had reached the established curricular objectives for groups higher than their own. It had been a long battle but, fresh out of college, we had mustered the energy to fight the good fight and had demonstrated student achievement beyond prior expectations.

After I explained how I had structured the freshman English classes, she commented, "My, you certainly choreographed a complex set of lesson plans." I had not thought of myself as a choreographer — my teaching metaphor had come to be that of a demolition expert, removing the barriers to learning. It was a metaphor I had made my own, as much from a desire to build learning skills in my students, as from a restlessness with sameness, and a desire to design something different for the curriculum. Being drawn to the new was born out of my personality type, as I was to discover some thirty years later.
Serendipitously, this restlessness had resulted in a multimodal curriculum that had reached the majority of students in that low English group. From daily journaling, to role playing, song writing, and demonstrations on hair styling, presented in oral and written modes, I had managed to engage the learners to where they were open to the literature and composition required of freshmen. I did not realize then that I had tapped into learning styles, but I knew something wonderful had happened. Years later I would identify this as my emergence as a constructivist teacher, realizing the importance of relevance and meaning making.

The time was 1990 on a cold, snowy, February day in a suburb of Chicago. The setting was my office where I sat talking to Bill, an eleventh-grade dropout, and now a senior engineer and trainer for a major telecommunications company. He sat in the office chair, his tall, spare, body leaning away from me, almost defensively, as he told me how he had worked his way up in the company from a telephone installer almost thirty years before. His lack of a high school diploma was obviously a sensitive point with him. When I began the feedback session with, “You’ve done well,” he seemed to melt into his chair with relief – yet one more time he wouldn’t have to defend his lack of education.

An hour later, Laurel was sitting in the chair previously occupied by Bill. Laurel was 32, with a master’s degree in electrical engineering, and also a senior trainer for the telecommunications company. She described the excitement of being transferred from a Northeastern state office to this home
office training center. She sat on the edge of her chair, so animated, I feared she’d fly off in another moment.

Both Bill and Laurel were recent graduates of a new train-the-trainer curriculum our team had successfully piloted at the training center. I was meeting with them individually, and with other graduates, to provide feedback on my first post-course observation of their teaching, having only good news to give them. This afternoon was the successful culmination of an eighteen-month project in which we had revised the entire curriculum for the training center to address learning styles differences.

For a number of years after leaving secondary education and educational publishing, I worked in this train-the-trainer position where I was responsible for training and supervising technical instructors. They were predominantly engineers who had accepted three-year rotational teaching assignments at the training center of their national employer, a major telecommunications company.

Over the years as I observed the students teaching others after completion of their training, I became increasingly puzzled with their limited range of instructional strategies. Although the methods and models presented to them were varied, they generally planned their lessons and teaching in very similar ways once they completed their training. They used a limited number of instructional strategies and media, and only the behavioral criterion-referenced model. The predominant delivery mode was several hours of lecture accompanied by overheads or slides, followed by lab work executed from work sheets, and then written short-answer tests.
An opportunity arose to revise the train-the-trainer curriculum to emphasize multimodal delivery considerations as well as learning styles theory. Academic researchers at the corporate headquarters were encouraging training sites to avail themselves of current literature in the fields of adult learning, learning styles and teaching. An additional responsibility given the curriculum revision team was to shorten the training courses and make them potentially easy to revise because of the volatility of the technical content. From a projected shelf life of three years for most course material in 1978, the projected shelf life in 1990 had been shortened to six months for the emerging technology courses.

A few months prior to the curriculum revision assignment, I had experienced what I now believe was my major education epiphany. I had completed a forty-hour certification course, facilitated by Otto Kroeger, in use of the Myers-Briggs Type Indicator (MBTI), had passed the national certification exam, and had attended additional training in use of the MBTI in organizations. I had discovered a psychological type and learning styles theory that made sense to me based on my classroom experience. Because of that MBTI experience, I began to study the personality types of the instructors. Coincidentally, the student instructors were being asked to complete the self-scoring MBTI Form G before attending instructor/course developer training.

I was fascinated to learn that like both Bill and Laurel, approximately 85 percent of the student instructors were of one personality type, Introverted-Sensor-Thinker-Judger (ISTJ). According to Jungian theory (Myers & McCaulley, 1985), ISTJs prefer individual work, learning by doing, are concerned with

xiv
product first and people second, and prefer high structure, sequence and closure, while avoiding change if given a choice. The saying, "If it works, don't fix it," might well have been coined by an ISTJ.

As I continued to read more on learning styles and personality type, I realized that the ISTJs were teaching in the ways they themselves preferred to learn as documented by Myers and Myers (1980) and Myers and McCaulley (1985). The development team's concern was that if training courses were to be accelerated with stronger results in retention and application, all learning styles would have to be considered by the instructors in developing and delivering their training. The student population was diverse in personality types and the instructors were teaching only to their own type.

What followed was the incorporation of learning styles considerations into the train-the-trainer and student curricula with gratifying results in student comprehension and performance. The instructor training curriculum was enhanced with applications of adult learning theory, psychological type theory, and accelerated (multimodal) learning methods (Dick & Carey, 1990; Meier, 1989; Rose, 1985).

Once the student instructors understood their preferred learning modes and those of their students, they consciously incorporated multimodal design and delivery into their training. They began to use individual and group learning strategies, advance organizers, case studies, kinesthetic activities, gaming, concept mapping, and other learner-centered methods. The instructor evaluation forms used by the training center's students and by management were revised to

xv
reflect attention to learning styles diversity in design and delivery. We conducted an informal study during the process, but published only the general curriculum revisions (Harrison, Oehler, Ouellette & Ross, 1991).

Those two events in my professional life, thirty years apart, were milestones in the development of my interest in learning and teaching styles. This study brings my interest in learning styles and teaching styles full-circle, back to the academic environment. The results of this study furnish additional insights to the body of literature on why teachers teach as they do, and can assist teacher educators in their planning of course work for preservice teachers, in particular, career changers or the non-traditional adult students.

Like the engineers whom I trained in the telecommunications environment, the non-traditional teachers have often come from careers where they self-selected into areas of interest and education (Myers & McCaulley, 1985). They are older and have probably developed and reinforced their personality types and their learning styles preferences. Without course work which includes the impact of their learning styles on their teaching styles, they may well favor their own learning styles in teaching a diverse student population.
CHAPTER 1

INTRODUCTION

Purpose of the Study

This study examined the influence of four non-traditional teachers' personal learning styles on their teaching styles. Two of the participants were middle school teachers and two were high school teachers. The study examined aspects of two earlier studies that looked predominantly at elementary school teachers. The first was Huelsman's (1983) study of traditional elementary school teachers: *An Exploratory Study of the Interrelationships of Preferred Teaching Styles, Preferred Learning Styles, Psychological Types, and other Selected Characteristics of Practicing Teachers*. The second study was Caples' (1993), *A Comparison of the Teaching Strategies Repertoire of Second- and Third-Year Graduates of an Alternative Teacher Education Program and Traditional Teacher Education Programs*. Recommendations for further research in these two quantitative studies were in part the basis of this current study. Caples recommended that a study be conducted "using structured observations of the teachers to see if their classroom practice affirms what they say they do" (p. 223). Huelsman recommended that "group categories of personal characteristics be re-identified in order to test for other relationships which were
not explored in this present study" (p. 140). This present study explored both recommendations.

The goal of the present study was to explore the relationship between non-traditional teachers' personal learning styles and their teaching styles using qualitative methods. Each of the four non-traditional career-change teachers studied was representative of a different learning style as indicated by the Myers-Briggs Type Indicator (MBTI) (Briggs & Myers, 1993) (see Appendix A). The teachers were identified and interviewed, and then observed teaching in their classrooms for an average of six periods. The researcher used observation checklists and narratives to document the instructional strategies and media the teachers used regularly (see Appendices B, C and D). Pre- and post-observation interviews with the teachers and secondary sources provided additional data (see Appendices E, F and G). Other potential influences on teaching styles, such as availability of resources, administrative policies, prior experience, and beliefs, were also examined.

Background

Alternative Certification Programs

Since the introduction of alternative certification programs for teacher licensing in the 1980s, growing numbers of teacher candidates are coming from the ranks of career changers (Fiestritzer, 1994). Corporate downsizing, life partner transfers, changing values among workers, retirement incentives and downsizing programs for the military, and a projected shortage of teachers in
1986 increased the number of career change adults in these programs, variously called alternative certification, non-traditional, and graduate licensure.

One definition, that of the U. S. Department of Education, describes alternative certification programs as those that enroll uncertified persons with at least a bachelor’s degree, offering shortcuts, special assistance or unique curricula leading to eligibility for a standard teaching credential (cited in Guyton, Fox & Sisk, 1991). Another definition, that of California, describes alternative certification as “any systematic teacher preparation program that departs from the traditional foundation-pedagogy-student teaching model” (McKibbin & Ray, 1994, p. 201). The number of states with alternative certification programs has grown from three in the 1980s, to 41 in 1993, with 68 different programs in existence (Fiestritzer, 1994, p. 135).

**Characteristics of Non-Traditional Teacher**

Adults enrolled in alternative certification programs are generally from two backgrounds: (a) degreed in a field other than education and with few if any education credits, and (b) non-degreed with college experience ranging from none to a few credits short of a baccalaureate (Zumwalt, 1991). As with traditional track teacher candidates who entered college soon after secondary school and progressed through to a degree and a license, these career change adults bring with them a myriad of variables that impact their work in the classroom. Unlike the traditional track teacher candidates, the career changers bring to the classroom the additional variables of age and maturity, diversity of
perspectives, and in some cases, extended professional experience in fields other than education (Bendixen-Noe & Redick, 1995; Broyles, 1992; Dill, 1994).

**Existing Research**

Because of their increasing numbers, these non-traditional teachers bear study, however, research on them is currently sparse and focuses primarily on the success of the programs in which they are enrolled. Few studies address how non-traditional teachers' personal learning and teaching styles may affect their teaching. Among them are Caples (1993) and Pankratius (1997).

Existing educational research has looked at numerous variables that impact the work of traditional program graduates in the classroom. Among these variables are prior beliefs, life and school experience, education, and school culture (Lortie, 1975; Nespor, 1985; Shulman, 1986), as well as prior professional experience (Bennett, 1991; Broyles, 1988).

Another variable, the impact of learning styles, has emerged since the 1980s as an additional area of research on factors influencing teaching. The bulk of this research hypothesizes that if teachers understand their students' learning styles preferences, they can plan their instructional strategies to meet their students' diverse learning styles (Boersma, Kienholz, Jovne & Chapman, 1989; Davidson, 1990; Dunn, Beaudry & Klaves, 1989; Hong, Perkins & Milgram, 1993). A modest number of studies focuses on the teachers' own learning styles, and on the possibility that their personal learning styles may be
a strong influence on teachers' curriculum development and teaching (Bennett, 1976; Huelsman, 1983; Lawrence, 1993; McCaulley, 1974; Moore, 1993).

Previous quantitative research found some correlation between teachers' learning styles and teaching styles (Doyle & Rutherford, 1984; Fox, 1984; Henson & Borthwick, 1984; Huelsman, 1983). Huelsman studied traditional program graduates using four self-report instruments: (a) Lotus Teaching Preference Questionnaire; (b) Myers-Briggs Type Indicator; (c) Learning Style Preference Questionnaire; (d) Self Analysis Questionnaire. Huelsman found that 89 percent of the participants reported that they taught as they preferred to learn either "often" or "always." Huelsman's study is one of the few that dealt directly with the relationship between learning styles and teaching styles and selection of instructional strategies and media. In her study of traditional program graduates, she found that: "while preferred teaching style appears to reflect preferred learning styles to some degree, the relationship between preferred teaching and learning styles does not fully explain the teaching style preferences of practicing teachers" (p. 133). Although Huelsman's recommendations for further study were primarily of a quantitative nature, this researcher felt that using qualitative methods could add to Huelsman's findings, as well as explore a different population, non-traditional teachers.

This present study employed one instrument from the Huelsman (1983) study, the MBTI, in addition to classroom observations, structured interviews and stimulated recall interviews based on videotapes of the participants teaching.
Research Questions

In order to study what Huelsman (1983) called the complex combination of the teacher as both teacher and learner, the study focused on the following questions:

1. Do the participants select instructional strategies and media based predominantly on their personal learning styles preferences?

2. What other factors, e.g., environmental, administrative, or cultural, influence the participants' choices of instructional strategies and media?

Included in these questions was an examination of the following: (a) What instructional strategies do the participants say they use in the classroom? (b) What media do the participants say they use to support the strategies they use in the classroom? (c) What reasons do they give for their choices? (d) What instructional strategies and media are the participants observed using in the classroom?

Theoretical Framework for the Study

The theoretical foundations of this study drew from five major areas of research in education and educational psychology: (a) personality type, (b) learning style, (c) teaching styles, (d) characteristics of non-traditional teachers, and (e) the influence of beliefs and prior experience on teachers. The theories are described in detail in Chapter Two, Review of the Literature. A brief description follows.
Personality Type

Jung (1921/1977) proposed that personality type is present at birth and develops throughout a lifetime. The essence of the Jungian theory is that "much seemingly random variation in behavior is actually quite orderly and consistent, being due to basic differences in the way individuals prefer to use their perception and judgment" (Myers and McCaulley, 1985, p. 1). Myers and McCaulley (1985) described perception as involving "all the ways of becoming aware of things, people, happening, or ideas," and judgment as involving "all the ways of coming to conclusion about what has been perceived" (p. 1).

According to Jungian theory, types are composed of four functions. The functions are designated as: Extroversion or Introversion (E/I), the function which energizes a person and gives him/her the stimulation to carry on with life; Sensing or Intuition (S/N), the function that provides a conduit for inputting data and learning; the Thinking or Feeling (T/F) process that drives decision-making; and Judging or Perceiving (J/P), the practical-living function. The Myers-Briggs Type Indicator (MBTI) was developed to identify and study personality and make personality theory applications useful to practitioners in numerous helping professions including counseling and education.

This study used Myers and McCaulley’s (1985) Jungian-based theory. They wrote that people self-select into careers that compliment their personality types and where their preferences for inputting data and making decisions are supported by their work environment. (Myers & McCaulley, 1985). If one applies
the theory to selections of teaching fields, middle school and secondary school teachers with prior careers in which they had been interested and successful might self-select into teaching in related content areas. Their personality types, learning styles and teaching styles would be supported by their choice of teaching fields as their personality types and learning styles had been supported in their prior careers.

Psychological type theory was developed by Carl Jung (1875-1961) to explain some of "the apparently random differences in people's behavior" (Myers, 1993). According to Jungian theory, differences in people's behavior are caused by the preferences they draw on to energize, input data, make decisions and conduct their daily lives in the outside world. Katharine Cook Briggs (1875-1968) and her daughter, Isabel Briggs Myers (1897-1980) studied and expanded the ideas of Jung. They developed the MBTI which identifies 16 personality types (Table 1). Each of the four letters in a type represents the preferences for energizing, inputting data, making decisions, and acting in the outside world.

The 16 types can be divided into quadrants in several ways. One method representing the learning style, incorporates the second and third functions, perception or data input, and judgment or decision making. This quadrant combination, one of several used extensively in learning and teaching styles research (Lawrence, 1984) was used for the present study.
### Table 1

**Personality Types Identified by the Myers-Briggs Type Indicator**

<table>
<thead>
<tr>
<th>Type 1</th>
<th>Type 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introverted Sensor Thinker Judger</td>
<td>Introverted Intuitor Feeler Judger</td>
</tr>
<tr>
<td>Introverted Sensor Thinker Perceiver</td>
<td>Introverted Intuitor Feeler Perceiver</td>
</tr>
<tr>
<td>Extroverted Sensor Thinker Perceiver</td>
<td>Extroverted Intuitor Feeler Perceiver</td>
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<td>Extroverted Sensor Thinker Judger</td>
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<td>Extroverted Sensor Feeler Perceiver</td>
<td>Extroverted Intuitor Thinker Perceiver</td>
</tr>
<tr>
<td>Extroverted Sensor Feeler Judger</td>
<td>Extroverted Intuitor Thinker Judger</td>
</tr>
</tbody>
</table>

### Table 1 Legend

<table>
<thead>
<tr>
<th>Designation</th>
<th>Letter</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extrovert of Introvert Sensor or Intuitor Thinker or Feeler Judger or Perceiver</td>
<td>E or I, S or N, T or F, J or P</td>
<td>Energizes externally (with people) (E) or internally (I). Inputs data through the senses (S) or through the abstract (N). Makes decisions based on product (T) or people (F). Prefers to live in the outside world in a planned, orderly way (J), or in a flexible, spontaneous way (P).</td>
</tr>
</tbody>
</table>

Table 2 depicts the 16 personality types with the two functions of the learning styles preference highlighted in each personality type. Researchers have theorized that the learning style preferences are similar for each of the four quadrants usually portrayed in the MBTI Type Table (Myers & McCaulley, 1985), regardless of energizing preference (E/I) or external living preferences (J/P).
<table>
<thead>
<tr>
<th>IS</th>
<th>SF</th>
<th>NF</th>
<th>NT</th>
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<tbody>
<tr>
<td>ST</td>
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</tr>
<tr>
<td>ST</td>
<td>SF</td>
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</tbody>
</table>

**Learning Styles**

Keefe and Ferrell (1990) defined learning styles as "the composite of characteristic cognitive, affective and psychological factors that serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment" (p. 59). According to some theorists, learning styles are an umbrella term that covers the cognitive, affective and psychomotor domains of the way people make new information their own, that is, learn (Gagné, E. D., 1985; Keefe, 1987; Linard, 1994).
In Jungian personality type theory, learning styles are an aspect of personality type (Myers & Myers, 1980). Learning styles are composed of two factors, (Sensor/Intuitor) a preference for inputting data, and (Thinker/Feeler) a preference for making decisions. Three aspects of educational achievement included in learning styles are: “aptitude, application, and interest” (Myers & McCaulley, 1985, p. 95). Myers & McCaulley (1985) proposed that “the extent to which a student has aptitude, interest and application for learning depends on many other factors such as age, previous achievements, life events and level of type development” (p. 102).

**Teaching Styles**

Teaching styles encompass individual choices from a repertoire of instructional strategies and their accompanying media (Joyce, Weil & Showers, 1992). They consist “of a complex of personal attitudes, traits, and behaviors, and the media used to transmit or receive data from the learners” (Huelsman, 1983, p. 15).

According to Jungian-based theorists, one influence on teacher/student interaction in the learning process is the teacher’s personality type with its accompanying preferences (Hall & Nordby, 1973; Lawrence, 1993; Myers & Myers, 1980). Additionally, proponents of the theory maintain that the more mature people are, the more developed are their personality types and learning styles, given environments that have supported their individuation. In further describing the major focus of Jung’s theory and practice, Hall & Nordby (1973)
described individuation as the developmental process through which a person “develops into a fully differentiated balanced and unified personality” (p. 81).

Overt aspects of teaching styles can be identified through observation, while the covert aspects of teaching styles can be identified, in part, through interviews and psychometric tools.

**Characteristics of Non-Traditional Teachers**

At least four main areas of difference appear to exist between non-traditional teachers and their younger counterparts in traditional programs (Bendixen-Noe & Redick, 1995; Broyles, 1992; Dill, 1994; McKibbin & Ray, 1994). These are (a) age, (b) work experience, (c) motives for entering teaching, and (d) minority representation. The majority of alternative certification programs recruit from college graduates with a BA or better, hence the group is older. Bendixen-Noe and Redick (1995) cited 28 to 57 as the average age range of non-traditional teacher candidates. Non-traditional teachers often have worked in careers that involved their undergraduate majors, for example medicine, law, engineering, homemaking, business and the military (Broyles, 1992; Kennedy, 1991; Zumwalt, 1991).

Nationally, there are declining numbers of minority students graduating from traditional education programs. Alternative certification programs are seen by legislators and school districts as a way to increase the ranks of minority teachers, particularly for the hard-to-fill urban teaching positions (Feistritzer, 1994). In New Jersey, alternative certification has been the largest source of
qualified minority teachers since the inception of the program. In Texas, where 91 percent of all public school teachers are Caucasian, minorities represent 43 percent of teachers entering the profession through state alternative certification programs.

Non-traditional teacher candidates verbalize a need to have more meaning to their lives and to use their life experiences to be of service (Bennett, 1991). Broyles (1988) found that non-traditional teacher candidates described themselves as more open to change, more accepting of less need for order, more prone to analyze their motives and feelings and more inclined to judge people by why they do things rather than by what they do.

**The Influence of Beliefs**

Brookhart & Freeman's (1992) metanalysis of studies on characteristics of entering teacher candidates found, in part, that (a) teachers' beliefs about students and classrooms have an important influence on what they do in the classroom; (b) knowledge and skills that are inconsistent with beliefs are not used in the classroom; (c) beliefs can be modified with practical classroom experience; and, (d) efforts to change teaching practices must consider teacher beliefs from the beginning.

**The Influence of Prior Experience**

Lortie (1970) found that the years spent in a classroom as a student, the "apprenticeship of observation," had a major impact on teachers. "What students learn about teaching, then, is intuitive and imitative rather than explicit
and analytical" (Lortie, 1970, p. 62). In their study of non-traditional preservice teachers, Powell and Burrell (1992) identified prior experience as including the influence of personal K-12 experiences, the influence of relatives in the teaching profession, work experience and course work.

For this study each of the participants was described as having a distinct personality type and a learning style deriving from that personality type. Each participant's teaching style was described as a result of classroom observations, interviews with the participant, and interviews with secondary sources for triangulation.

The Setting

The four participants taught in the West School District, one of the nation's largest in geographic area and in student population. Included in the district are a variety of school environments ranging from Native American tribal schools to technology magnet schools in an urban setting. Two participants were middle school teachers, each in a different school, the third taught in a traditional secondary school, and the fourth taught in an alternative secondary school. A wide range of socioeconomic and racially diverse populations were represented by the four schools.

One of the major sources of teachers for the West School District is Southwest University (SWU) located in a rapidly-growing western state. The University's College of Education has two teacher education programs – an undergraduate program leading to a bachelors degree and fulfilling the state's
requirements for licensing, and a graduate licensure program that first meets the state’s requirements for licensing and then leads to a Masters in Education degree. Both programs are representative of traditional and non-traditional teacher education programs throughout the United States.

Population in SWU’s undergraduate program is characterized by a mixture of traditional students who have followed a linear academic path, usually enrolling soon after high school graduation, and career changers, mature adults who have returned to finish their degrees and change their careers to teaching. The typical age range of this undergraduate population is from 20 to 28.

The graduate licensure program at SWU attracts college graduates who have worked in other careers since earning their bachelor’s or master’s degrees or persons who became full-time homemakers following their graduation from college and did not work in a career outside the home. The average age for this graduate group is 38. Although the MBTI is used in some of the curriculum for teacher education at SW University, there is currently no systematic focus on the learning and teaching styles relationship. The participants for this study included graduates of both SWU’s teacher preparation programs, a graduate of a similar program from another university, and a graduate of a traditional program who followed a non-traditional path to teaching.

Rapid growth characterized the school district and the city. Of the four sites used for this study, one middle school, only seven years old went through a building expansion that doubled its size, opening the fall of 1996. One high
school was using multiple temporary classrooms housed in trailers. Another site, the alternative high school, was sharing facilities with a traditional high school and using a number of portable classrooms. Though an extensive modernization and construction program was under way that would add almost 30,000 classroom seats, West School District would still suffer a severe seat shortage for the foreseeable future.

Significance of the Study

This study has provided increased information on the variables non-traditional teachers bring to their teaching. The findings of this study can inform curriculum planning and preparatory programs for teacher educators, and can also be used by school districts in induction programs. Researchers will benefit from placing personality type theory into their considerations of how teachers and students create meaning from their worlds.

The results of this study will add to the knowledge base of teacher education for traditional as well as non-traditional students in colleges of education, and the results may affect practice. Understanding the major and lasting influences on teachers’ selection of instructional strategies and media may inform teacher education curriculum planning, helping to increase the repertoire of instructional strategies and media used by teachers.

Because the results of the study suggest that learning styles and prior work experience influence career change teachers, they add to the body of knowledge on the adult learner, an increasingly larger group of students.
returning to the university (Feistritzer, 1994). These data offer teacher educators a framework on which to build curricula for non-traditional preservice teachers with extensive prior experience outside of the classroom, experience that may be influencing their teaching and curriculum design. Such prior experience could result, for example, in avoidance of collaborative learning by persons who have always worked well alone, or in resistance to integration of technology into the curriculum for persons who have never needed to use technology in their prior careers. The inclusion of learning styles considerations in preservice curricula can help preservice teachers understand the need for using varied instructional strategies and media to reach learners whose learning styles are different than their own. Sequencing, amount of detail, multimodal presentations, practice and assessment may all be impacted by the teachers' personal learning styles without their being aware that this is the case.
CHAPTER 2

REVIEW OF RELATED LITERATURE

The context of this study was non-traditional teachers in the classroom. The theoretical bases of the study were influences on the teaching styles of those non-traditional teachers including factors such as personality type, learning styles, prior beliefs, and experience. This review of the literature begins with a historical perspective of research on teacher characteristics and then addresses five areas related to the study: (a) personality type theory; (b) learning styles theory; (c) teaching styles and selection of instructional strategies and media; (d) teacher beliefs and prior experience; and (e) characteristics of non-traditional teachers.

Historical Perspective

Throughout its history, the focus of research on education has moved among the areas of content, learning, and teaching (McMillan & Schumacher, 1993; Schulman, 1986). Teacher characteristics including prior beliefs, experience and personality type are modern areas of research that began in the late 1960s (Bennett, 1976; Shulman, 1986).

On the other hand, the study of learner differences and the need to adapt to them is as old as education itself. Corno and Snow (1986), cited the fourth
century B. C. Chinese treatise of Yuezheng that noted: "The success of education depends on adapting teaching to individual differences among learners" (p. 605). Similar concepts, noted Corno and Snow (1986), could be found in the ancient Hebrew Haggadah of Passover, and in the De Institutione Oratorio of Quintilian in first century Rome.

Over 2000 years later, the Office of Technology Assessment report, Teachers and Technology: Making the Connection (U. S. Congress, 1995), identified the need to adapt teaching to learner diversity and the need for teachers to understand diversity in order to do so. This report noted that "many technology-using teachers find that technology can help them improve student learning and motivation, address students with different learning styles or special needs, expose students to a wider world of information and experts, and implement new teaching techniques" (p. 10). What happened between 400 B. C. and 1995 A.D. in terms of learning styles-related research?

Formal education in the United States was once the domain of either the wealthy, or of the chosen male. Through the years it has become the assumed right of every male and female. We live in a complex, volatile society where national lines are becoming blurred, educational goals are being constantly revisited (The Secretary's Commission on Achieving Necessary Skills, 1991), skilled workers or professionals to run the economy are in constant demand (Jamieson & O'Mara, 1991; The Secretary's Commission on Achieving Necessary Skills, 1991), and educational equity and access are sometimes at
odds (Kozol, 1991; Noll, 1993; Sadker & Sadker, 1994). Sor Juana Inés de la Cruz’ seventeenth-century admonition to the male-dominated academic institutions of Mexico foreshadowed similar admonitions in the Civil Rights movement of the 1960s.

Like men, do they not have a rational soul? Why then shall they not enjoy the privilege of the enlightenment of letters? Is a woman’s soul not as receptive to God’s grace and glory as a man’s? Then why is she not able to receive learning and knowledge, which are the lesser gifts? What divine revelation, what regulation of the Church, what rule of reason framed for us such a severe law (cited in Smith & Smith, 1994, p. 217).

Education has become accessible to an increasingly immigrant American nation, as well as to formerly disenfranchised groups. Student populations have grown proportionately in racial, ethnic and special needs diversity. As the population and access have changed, the way teachers teach and what they teach must also change, say national reports. Proposed solutions to improving education are as diverse as they are numerous. Though reform movements are national in scope, each of the 50 states and the District of Columbia has local, legal responsibility for public education (Sadker & Sadker, 1994).

Education reform movements in the United States since the 1980s have focused on meeting the needs of diverse learners as well as on improving teacher education (Carnegie Forum on Education and the Economy, Task Force on Teaching as a Profession, 1986; The Holmes Group, 1986; National Commission on Excellence in Education, 1983). One aspect of the reform
movement is teacher education. Looking at individual teacher characteristics is a relatively new piece of this growing research.

Bennett (1976) noted that "research on teaching has had a respectably long but, according to Gage (1972), a regrettably inglorious history" (p. 12). Medley's (1972) history of teaching in the United States discerned three phases: (a) factors involved in effective teaching, from the beginning of the twentieth century to the early thirties; (b) a dormant interim lasting until the 1960s, during which "the foundations of a branch of education research devoted to the analysis so teaching had been laid and many of the blind alleys explored" (p. 13); and (c) a third phase where researchers began to move away from objective rating scales and toward more objective observation schedules (cited in Bennett, 1976).

Medley attributed the stimulus for this more objective observation phase to Anderson (1939) and Jayne (1945). According to Medley (1972), Anderson saw three important characteristics of such observation approaches:

Firstly, they measure meaningful and potentially important behavior patterns or traits; secondly, they retain the objectivity and reliability of the original items on which they are based; and thirdly, since the dimensions are measured in terms of specific behaviors they are much more useful in helping the teacher to effect change in his behavior should he wish to do so (Cited in Bennett, 1976, p. 14).

Dunkin and Biddle (1974) supported and encouraged research on teaching as being more likely to produce useful knowledge. They cited reasons of critics for failure of early research efforts on teaching effectiveness: "(a) failure
to observe teaching activities; (b) theoretical impoverishment; (c) use of inadequate criteria of effectiveness; and (d) lack of concern for contextual effects” (p. 13).

Dunkin and Biddle (1974) developed a model to look at teachers and teaching. The model, originally proposed by Mitzel (1957), presented the sets of variables to be included in the study of classroom teaching. The thirteen variables were divided into four classes: presage, context, process and product. Presage variables deal with characteristics of teachers, including their experiences, and are a useful way to organize research that looks at learning styles.

In the preface to the 1986 edition of the Handbook of Research on Teaching, Shulman wrote that since the publication of the second edition in 1973, research on teaching had flourished. Since then, he noted, traditional lines of inquiry matured and emerging areas of research evolved. The old and new areas of research led to chapters in the third edition that had no counterparts in the two earlier editions of the Handbook. These chapters covered research on teachers’ thought processes, students’ thought processes, the teaching of learning strategies, and the measurement of teaching. This present study then, is part of the historical progression from content and learning to teachers and teaching.
Personality Type Theory

In 1929, Morris wrote that there was a general acceptance among educators that "a teacher's personality determines the manner and degree in which his knowledge and guidance contribute to the growth of pupils under his direction" (p. 6). It would be almost 30 years before educational research would look at those teacher characteristics and personality that Morris described.

This research ranged from the psychological models of the behaviorists in the 1920s and 1930s, to the cognitive psychologists in the 1960s and 1970s (Engler, 1995). The information-processing model of development psychology made a great impact on research in learning beginning in the early 1960s. Miller (1993) described information processing as "the first major theory of adult cognition to arise since developmental psychology became an experimental science" (p. 237).

The information-processing model, with its computer metaphor, was followed by the neural model, a model born from a partnership between the behavioral sciences and the neurosciences (Dempster & Brainerd, 1995). Related research since the 1960s included: the neural model (Caine & Caine, 1991); Jungian personality type theory as applied to a number of areas including cognition (Lawrence, 1982; McCaulley, 1976; Myers & Myers, 1980); and the perceptual model of learning (Dunn, 1982; Witkin, Oltman, Raskin & Karp, 1971; Wittrock, 1991).
In 1930, Allport, a pioneer in personality theory, wrote "there appear to be as many definitions of personality as there are authors" (cited in Perrin, 1990, p. 3). Perrin (1990) listed a number of contemporary definitions, the general theme being that personality is the study of individual differences in human behavior. Engler (1995) wrote that: "each theorist presents us with his or her own understanding of the term personality. In part, this helps us explain why there are so many personality theories" (p. 3).

Engler grouped personality theorists as those espousing a number of approaches: the psychoanalytic approach (Freud); the neopsychoanalytic approach (Jung, Adler, Horney, Fromm); more recent psychoanalytic theorists (Ana Freud, Hartmann, Erickson, Mahler, Kohut, Kernberg, and Chodorow); behavior and learning theorists (Dollard, Miller, Skinner, Bandura, Potter); dispositional theorists (Allport, Murray); trait and temperament theorists (Rogers, Maslow, May); Cognitive theorist (Kelly); cognitive-behavioral theorists (Ellis, Beck, Lazarus), and a non-western approach (Zen Buddhism).

A descriptive model of personality psychology evolved during the twentieth century. John (1990) described it as beginning with the work of Klages from 1926 to 1932, Baumgarten in 1933, and Allport and Odbert in 1936. The taxonomy of the model based on linguistic descriptors is now known as the "Big Five." John (1990) wrote that the taxonomy had been so named "to emphasize that each of these domains is extremely based and summarizes a large number of distinct, more specific personality characteristics" (p. 71). The work of Cattell...
in 1945 and others, pursuant to that of Allport and Odbert, led to identifying and cataloging the five dimensions: surgency, agreeableness, conscientiousness, emotional stability, and intellect/openness to experience.

Identifying the Myers-Briggs Type Indicator as one of the fourteen questionnaires or models of personality and interpersonal behavior, John (1990) placed it in the historical evolution of personality type research, also noting as the same time, the diversity of current conceptions of personality as well as the "important convergences" (p. 91). The MBTI was used as the instrument for identifying the personality type and learning styles of the participants in this present study because of the extensive literature available on its use in such research (Lawrence, 1984; CAPT, 1994), and because of research that indicates that the MBTI can be used to make general predictions (Carlson & Healy, 1989; Murray, 1990; Pittenger, 1993).

I found the neopsychoanalytic approach, as researched by Jung, Adler, Myers, McCaulley and others, a compelling theory within which to frame this study. Simply put, the conscious psyche "thoughts, feelings, sensations, wishes and so forth (Engler, p. 77), " can be described by psychological types. The personal unconscious, are "perceptions, thoughts, feelings, and memories that have been put aside (for our consciousness can only hold a few items at a time), and they may be easily retrieved" (Engler, p. 78).

A teacher's psychological type, conscious psyche, forms ways of perceiving the environment and orienting experiences (Thompson, 1984). That
teacher's personal unconscious may embody prior experiences and knowledge, retrieved easily where the social context presents a situation that requires action. The effectiveness of teachers may lie in their touching not only the conscious psyche of students, relating to the schema already present in the students (Light & Butterworth, 1993). It may also lie in their ability to help students make meaning of their world (Copeland, Birmingham, DeMeulle, D'Emidio-Caston & Natal, 1994).

In their constructivist rereading of Jung's work, Young-Eisendrath and Hall (1991) proposed that Jung was very much a constructivist. Although somewhat restricted by the Kantian views of his time, he developed a theory of the self creating a personal reality through social interaction, personal introspection, and tapping of the universal unconscious. When viewed historically, Jung's study of more complex mental functions is remarkably similar to that of his contemporaries, Vygotsky and Luria, now the focus of much educational research. Luria described Vygotsky's position:

Man is not only a product of his environment, he is also an active agent in creating that environment. The chasm between natural scientific explanations of elementary processes and mentalist descriptions of complex processes could not be bridged until we could discover the way natural processes ... intertwined with cultural determined process to produce the psychological functions of adults (cited in Young-Eisendrath & Hall, 1991, p. 18).

Key to Jung's personality theory is the presupposition that self-reflection and adult intentionality emerge from an a priori structure, an intelligence that is unconscious. In discussing Vygotsky's Thought and Language (Trans. 1962),
Bruner (1986) pointed out Vygotsky’s emphasis, similar to Jung’s, on the “transformation” of simpler mental functions.

Consciousness and control appear only at a late stage of development of a function, after it has been used and practiced unconsciously and spontaneously. In order to subject a function to intellectual control, we must first possess it. (p. 73).

Additionally, Jungian theory proposes that the more mature/older people are, the more developed are their personality types and learning styles. This assumes environments that have supported their individuation. Hall & Nordby (1973) described individuation as the developmental process through which a person “develops into a fully differentiated balanced and unified personality” (p. 81).

Personality type theory proposes that persons often gravitate to professions that offer them the opportunity to use their preferred modes (Hirsh, 1985; Kroeger & Thuesen, 1992; Myers & McCaulley, 1985). Applying personality type theory to the study participants, I speculated that the participants had self-selected into careers that complimented their personality type and where their preferences for inputting data and making decisions were supported by the environment. If this were so, the participants would have self-selected into teaching in subjects that had been related to the prior careers. Their personality types, learning styles and teaching styles would be supported by their choice of teaching field. The data base for the Center for Applications of Psychological Type (Myers & McCaulley, 1985) appears to provide evidence to
support the theory. There are strong indications that of the several million people
who have completed the MBTI in a number of languages, certain personality
types tend to gravitate toward specific career choices that support their
preferences (Macdaid, McCaulley & Kainz, 1986). Also, certain professions, for
example music and mathematics, are heavily represented by a limited number of
personality types (Myers & McCaulley, 1985).

The work of Myers and Briggs in Jungian typology belongs in the
mainstream of research in personality psychology. In their discussion of the
correlations of the MBTI scales with other self-report inventories, Thorne and
Gough (1991) noted that "better understanding of the MBTI scales can be
developed to a certain degree by examining correlations with other tests or
scales whose meanings are known" (p. 30). Among the instruments correlated to
the MBTI by Thorne and Gough and Myers and McCaulley (1985) are those of
intellectual-cognitive measures such as the Gottschaldt Figures Test and the
Scholastic Aptitude Tests for verbal and mathematical. Also correlated are
esthetic preference measures such as the Barron-Welsh Art Scale, and the
Revised Art Scale.

Learning Styles

In Gifts Differing, their definitive book on personality type, Myers and
Myers (1980) wrote that:

Type makes a natural and predictable difference in learning styles and in
student response to teaching methods. An understanding of type can help
to explain why some students catch on to a way of teaching and like it,
whereas others do not catch on and do not like it. Two distinct problems are involved here. Catching on is a matter of communication. Like is a matter of interest (p. 47).

Myers and Myers went on to postulate that students remember only the aspects of presentations that "capture their attention and interest" (p. 154). Personality type theory can offer a base to increase teacher knowledge and skill levels for reaching diverse learning styles (Boersma, Kienholz, Jovne, & Chapman, 1989; Lawrence, 1993).

Learning styles are the "composite of characteristic cognitive, affective and psychological factors that serve as relatively stable indicators of how a learner perceives, interacts with and responds to the learning environment" (Keefe & Ferrell, 1990, p. 59). Acknowledging the existence of learning styles can complement the approach a teacher uses in the classroom to facilitate learning (Corno & Snow, 1986; Dunn, 1982; Jonassen & Grabowski, 1993; Sims & Sims, 1995). Constructivist-based approaches of discovery learning, reception learning, assisted learning or scaffolding can be used with any learning style. It is in the initial reaching of the learner that styles come into play. Once a child is in what Vygotsky identified as the "zone of proximal development" (Newman & Holzman, 1993, p. 56) perhaps all that a teacher can offer the child is the opportunity to learn what the child is capable of learning by addressing individual learning styles.

Myers and Myers (1980) wrote that learning styles are developed through nurturing. For example, an Intuitor child who prefers the world of ideas may not
thrive under a heavily Sensor parent whose focus is the here-and-now practical aspects of life. A child who is consistently offered opportunities to learn in a preferred mode will have some barriers to learning removed.

What research does exist on learning styles ranges from learning styles' assessments to application in curriculum design and teaching. Doyle and Rutherford (1984) cited the "sheer diversity of work on learning and teaching styles" (p. 21) as presenting daunting problems for the teacher. That same year Hyman and Rosoff (1984) discussed the current application and theory as being incomplete and limiting. They encourage researchers to look for a new paradigm/model for teachers to use in implementing "learning style based education" (p. 35).

In 1990, O'Neil wrote that although "experts say learning styles theory has left its mark on many schools, a lack of cohesion about paradigms and about how learning styles should influence teachers still left the learning/teaching styles movement in doubt" (p. 8). Bargar and Hoover (1984) wrote that educational implications of psychological type and cognitive styles included conflicts in type could lead to difficulties in interpersonal communications among students and between students and teachers. "Type," they wrote, "may affect students' preferences for instructional alternatives; similarly, type will affect teachers' preferences for instructional alternatives" (pp. 60-61).

Myers and McCaulley (1985) cited representative studies on type differences in student learning and on how teachers are intervening to improve
learning as function of type. They noted that "early studies related learning styles to individual preferences. Later work has attempted to deal with the complexity of type differences" (p. 130). Myers and McCaulley discussed Eggins (1979) ATI study that provided insights into pedagogical models and type. Myers and McCaulley reported that "Bruner's model imposes the least structure on learners" (p. 130), and is helpful to intuitive types, while Ausubel's model provides "a bridge for sensing and intuition" (p. 130). Eggins' findings also concluded that "sensing types learned better with the Gagné method if they were field dependent and the Ausubel method if they were field independent" (p. 130). The body of literature that exists in matching teaching styles to learning styles is growing, particularly in the context of addressing diversity among students.

Compensatory education movements in the last decade have highlighted another aspect of research on learning styles, that of the impact of ethnicity, race and gender on learning. Current research, however, is divided on major cognitive differences based on these elements. Bennett (1990) stated that learning styles are "believed to be a combination of both heredity and environment" (p. 141), and went on to cite the work of Ramirez and Castañeda (1974) as an example. Ramirez and Castañeda suggested that learning style is related to world view. They wrote that cultures, such as the Mexican-American, are representative of bicognitive learning styles – people able to function in their preferred Mexican cultural mode, field dependent or global in orientation, and North American cultural mode, analytical. Bennett pointed out that teachers,
unless they learn to do otherwise, expect their students to learn the way they themselves learn. Bennett supported personalizing examples to fit cultural experiences of students, a strategy espoused by many educators including Freire (Escobar, Fernandez, & Guevara-Niebla, 1994), and Vygotsky (Miller, 1993).

Attending to learning styles differences may also result in attending to cultural differences. Anzano and Terminello’s (1993) work with Navajo Head Start teachers demonstrated two points: (a) that understanding the culture of teacher trainees was important in facilitating their writing progress; and, (b) oral learners could best be reached by tapping into those strong oral skills. Oral learners are not unique to any one culture (Myers & Myers, 1980).

Swisher (1991) reviewed the literature on educating American Indian and Alaskan Native students. In describing the numerous studies that looked at aspect of learning styles, her language was reminiscent of most of the studies cited in this chapter. Learning style was defined as the “method by which one comes to know or understand the world” (p. 1). Aspects of learning style, according to Swisher, included learning by observation and the manner in which competence is demonstrated, whether through observation prior to attempting public performance, or through self-testing in private. Remove the ethnic classifications and one could be speaking of the results of learning styles instruments administered in a middle-class suburban school. The student who
prefers to observe before doing could be an MBTI Intuitor, while the student who prefers self-testing could be an Introverted-Sensor (Myers & Myers, 1980).

Swisher (1991) wrote that knowing group characteristics and overgeneralizing them does not help much when it comes to individual learners and may lead to: “stereotypic notions about the relationship between learning style and cultural group membership, discriminatory practice (for example, inappropriate grouping) and, inappropriate excuses for failure in teaching and learning “(p. 3).

Teaching Styles

The history of research on diversity in teacher characteristics, in western education, is a long and winding road. A useful way to look at it is Dunkin and Biddle’s (1974) Model for the Study of Classroom Teaching. They identified three categories of factors that affect teachers before they enter the classroom. These presage variables, as Dunkin and Biddle called them, are: teacher formative experience, teacher training experience, and teacher properties (cited in Shulman, 1986, p. 6). The third category, teacher properties, includes teaching skills, intelligence, motivations, and personality traits.

In describing aspects of their model for studying teachers and teaching, Dunkin and Biddle (1974) noted that training and formative experiences cannot affect teachers’ classroom performance unless they retain traces of these experiences in their attitudes or behavior. “Thus we conceive of a third variable class, teacher properties, which consist of measurable personality
characteristics that the teacher takes with her into the teaching situation" (p. 6). This study resided primarily in Dunkin and Biddle's presage variable category.

Myers and Myers (1980), and Myers and McCaulley (1980) identified the self-selection of (a) teachers for their profession, and (b) personality types clustering at certain grade levels. From their work, one can extrapolate that teachers with given personality types/learning styles would teach to their own types and conceivably have difficulty reaching children of types dramatically different than their own. Marshall's (1991) inservice work with teachers verified her hypotheses that "traditional instruction represented the collective style profile of teachers" (p. 226).

In support of matching teaching to learning styles, Carroll (1963) found that under his experimental conditions, the correlation between aptitudes and levels of achievement approached zero. Carroll's study disputed Thorndike's (1931) pioneer studies of aptitude and achievement that indicated only a third of students in general had high aptitude. Henson and Borthwick (1984) felt the implications of Carroll's findings were staggering and could be interpreted to mean that any student could learn anything given the needed time and the appropriate teaching methods.

The wisdom of matching teaching styles to student learning styles has been supported by a number of researchers (Barger & Hover, 1984; Davidson, 1990; Dunn, 1990; Dunn, Beaudry & Klavas, 1989; Felder & Silverman, 1988; Friedman & Alley, 1984; Keefe & Ferrell, 1990; McCarthy, 1990; Moore, 1993). A
key issue has been an accessible, useful assessment instrument for the classroom. Friedman and Alley (1984) cited success in five cases when teachers assessed their learning styles, then that of students, and coached them to use their own as well as a new one, a practice called flexing.

Selection of Instructional Strategies and Media

Possessing a varied repertoire of teaching strategies is important (Arends, 1988; Joyce, Weil & Showers, 1992; Shulman, 1986). Teacher education programs present varied models of teaching that provide a framework for selecting and using instructional strategies and media. As students, teachers have been exposed to numerous teaching models throughout their school years (Anderson, 1989). Preservice experiences such as student teaching expose students to additional models.

In describing her study of teaching repertoires of alternative program graduates, Caples (1993) noted that Hawley’s (1986) research “has suggested that effective teachers possess an array of instructional strategies from which they are able to select appropriate ways of facilitating student learning based on an analysis of their students’ learning needs and capabilities” (p. 3). The program Caples studied was designed to incorporate features proposed by a number of reform groups including the Holmes Group (1986), and the Carnegie Forum on Education and the Economy Task Force on Teaching as a Profession (1986). Caples found “being allowed to choose the teaching strategies to use and being encouraged to use certain strategies had no impact on differences
between the two teacher groups [graduate non-traditional and undergraduate traditional programs] (p. 207).” The non-traditional graduates were encouraged to use more strategies than the traditional participants. The five categories of strategies were: “(a) individual, (b) presentation/teacher directed, c) active learning, (d) higher order thinking, and (e) cooperative learning structures” (p. 208).

Teacher education courses can have a great impact on the mindset of preservice teachers toward instructional strategies and media (Clark & Solomon, 1986; Corno & Snow, 1986). Prior experience also appears to have a significant impact on how teachers select instructional strategies and media (Feiman-Nemser & Buchman, 1985; Provost, Carson & Beidler, 1987) and how they accept staff development content and innovation (Gushey & Sparks, 1991; Bennett & King, 1991). Mertz and McNeely (1992) studied pre-existing teacher constructs using the MBTI and found that constructs could be identified and accessed. They recommended that to prepare students to become teachers, teacher educators had to take into account pre-existing constructs.

With the increasing demands on schools to produce graduates who are problem solvers, decision makers and technology-savvy workers, the need for students to learn to apply technology to numerous venues is great (U. S. Congress, 1995; Papert, 1992; Thornburg, 1992). Lortie’s (1975) prediction has been realized. He wrote that it “appears that technical knowledge will play a progressively more important part in the collective life of teachers. They will
have to select from a growing number of options resulting from research and
development and find ways to adapt and refine ideas and practices in light of
their interests" (p. 240). Yet not all teachers make the transition to technology
easily, nor are they predisposed to consider the integration of technology into

If preservice teachers are to accept and master the use of technology as
a medium in the classroom, it must be modeled by their teacher education
faculty (Strudler, McKinney & Jones, 1995; U. S. Congress, 1995; Wetzel,
1993). A factor in faculty accepting the need to use and model the use of
technology may be a cognitive predisposition to accept or reject computer use
(Rude-Parkins, Baugh & Petrosko, 1993; Smith, 1995). Data on college faculty
who have completed the MBTI indicate a high percentage of Intuitio-Thinkers.
Intuitio-Thinkers have been identified as more predisposed to using computers
(Coburn, 1990; Jones, 1994; Wakefield, 1993).

Little research exists in the area of cognitive styles and computer use
among teacher education faculty (Rude-Parkins, Bough & Petrosko, 1993;
Sudol, 1991; Wicklein & Rojewski, 1995). More research exists on students and
cognitive styles in relation to learning technology (Baumgarte, 1984; Cross,
Durling & Johnson, 1996; Durling, 1996; Jones, 1994; Tyckoson & Jacobson,
preferences and selected computer use and attitude variables. The results of his
study suggested that "when strength as well as direction of preferences is
considered, two of the four cognitive style dimension on the MBTI are related to the likelihood of computer use" (p. 591).

In discussing media and teaching, Clark and Solomon (1986) noted the great deal of research interest in the past decade fueled by parent and educator concerns over the impact of student exposure to new media. The benefit of the concerns and research was a shift in the focus of research questions about media: "We moved from asking which medium was a better teacher to a concern about which 'attributes' of media might combine with learner traits under different task conditions and performance demands to produce different kinds of learning" (p. 473). New theories and models, Clark and Solomon (1986) wrote, were the most important development of the shift in research.

These 'symbol system' theories have led to a number of engaging hypotheses such as Olson's (1977) claim that 'intelligence is a skill in a medium,' and Salomon's (1979) expectation that student comprehension will be aided when symbolic modes of instruction more closely match student cognitive representations (p. 474).

Clark and Salomon (1986) concluded that apparently media do not inherently affect learning. "Rather, some particular qualities of media may affect particular cognitions that are relevant for the learning of the knowledge or skill required by students with specific aptitude levels when learning some tasks" (p. 474). They noted that cognitive effects were not necessarily unique to one medium or another but suggested a functional equivalence implying that there may be "families of functionally equivalent but nominally different instructional presentation forms" (p. 474).
Joyce, Weil and Showers (1992) reiterated the desirability of encouraging teachers to use varied instructional strategies and media. They described the success of disadvantaged children who were exposed to varied teaching repertoires. The opportunity to develop "increased capabilities to learn more easily and effectively in the future" (p. 1), Joyce, et al. noted, was enhanced by exposure to varied models of teaching which they described as "really models of learning" (p. 1).

Impact of Beliefs and Prior Experience

One focus of research on teachers and teaching since the 1970s has been the impact of beliefs and prior experience. This body of research was germane to the current study because the older non-traditional population of participants had significant work and life experience, in addition to their school experience, prior to teaching.

Lortie's (1975) study on teaching established a framework for looking at the impact of prior experience and beliefs (Nespor, 1985; Shulman, 1986; Wilson, 1990). Lortie's description of the "apprenticeship of observation" is reflected in research that continues today (Anderson, 1989; Feiman-Nemser & Buchmann, 1985). Lortie noted that the years spent in a classroom as a student had a major impact on teachers:

Students are undoubtedly impressed by some teacher actions and not by others, but one would not expect them to view the differences in a pedagogical, explanatory way. What students learn about teaching, then, is intuitive and imitative rather than explicit and analytical; it is based on individual personalities rather than on pedagogical principles (p. 62).
Brookhart and Freeman's (1992) metanalysis of studies on characteristics of entering teaching candidates found that:

1. Teachers' beliefs about students, classrooms and participant matter have an important influence on what they do in the classroom.

2. Knowledge and skills that are inconsistent with beliefs are not used in the classroom.

3. Efforts to change teaching practices must consider teacher beliefs from the beginning.

4. Beliefs can be modified with practical classroom experience.

5. Entering teacher candidate view the nurturing and interpersonal aspects of a teacher's role as more important than the academic aspects.

6. Entering teacher candidates view teaching as dispensing information.

Pajares (1992) reviewed research on teacher beliefs. Among the 16 findings noted by Pajares, two are particularly germane to this study: (a) beliefs are formed early and tend to self-perpetuate, persevering even against contradictions caused by reason, time, school, or experience, and (b) beliefs about teaching are well established by the time a student gets to college.

Buchmann and Schwille (1983) questioned the value of "experience is the best teacher." They challenged the growing trend in preservice education that gave more and more time to classroom experiences, and inservice programs.
that stressed teachers' sharing their experiences with one another. They wrote that experience could close paths to social and conceptual change, limit imagination and cause practices and standards to remain unchallenged.

Feiman-Nemser and Buchmann (1985) discussed the pitfalls of experience in preservice teacher preparation. They noted that if preservice teachers limited their view of teaching and learning to personal experience, they would limit themselves to fixed ideas as teachers. "They need help," wrote Feiman-Nemser and Buchmann, "in seeing how their personal history and experience of schooling influences their perceptions of classrooms in a way that makes it difficult to appreciate alternatives" (p. 71).

Beliefs may not change as a result of education course work and student teaching. Feiman-Nemser and Buchmann (1985) wrote that "doing well at the university brings immediate and highly salient rewards, which may not have much to do with success in teaching" (p. 67). Morine-Dershimer (1989) cited several studies indicating that student teacher beliefs remain unaffected by educational course work and student teaching. Nespor's (1985) important study on the role of beliefs in teacher practice found that beliefs were the dominant force in teachers' behaviors despite, in some instances, lack of familiarity with methods to implement those beliefs successfully.

Reflection appears to be an important skill in the growth process of teachers and may assist in helping to modify or change beliefs. Meyerson (1993) wrote of reflection as the first step in the change or growth process. She noted
that teachers needed to be aware of why they did what they did before they could accept an innovation to their existing beliefs. Zehm and Kottler (1993) wrote that "reflection is a critical dimension of what it means to be an effective teacher" (p. 103). They did not take on the debate of whether reflective people are "born or made" but described the reflective process as critical to becoming an independent thinker, and part of the mission of a teacher in developing the skill in their students. Louden's (1991) year-long study of one teacher's growth in teaching skills explored the teacher's beliefs about teaching and the challenge to those beliefs when a change in curriculum called for her to teach unfamiliar subjects. Preactive and postactive reflection played an important part in the teacher's growth. The teacher was able to overcome gaps in her knowledge and face change by using forms of reflection not only about her personal beliefs, knowledge and experience, but also about the traditions of teaching.

Dwyer (1994) reported on the changed beliefs and practices of teachers in technology-rich classrooms. The teachers, working in the Apple Classrooms of Tomorrow (ACOT) project, demonstrated changed beliefs and practices about collaborative work, the role of the teacher, and the use of technology. These changes were attributed by the teachers to accessibility of computers at home and work, hands-on coaching in their use, peer tutoring, and the opportunity to share achievements with their peers.

Rodriguez (1993) studied the theory/practice dichotomy in teacher education from the students' point of view. The participants began the school
year by selecting a personal metaphor for teaching. Rodriguez found that at the conclusion of the program, the students had not changed their metaphors, their prior beliefs about teaching and learning, but they had adjusted their perspectives to fit the constraints of the school context.

In summary, preservice teachers enter the classroom with well-developed beliefs in place. They come to teacher education programs with experiences, including their own schooling, that have a major impact on how they view their roles as teachers. These beliefs can be modified somewhat. The beliefs need to be addressed by teacher educators to open preservice teachers to thinking about the roles, methods, and purpose of teachers in alternative ways. Their prior experience can be surfaced and discussed within the context of sound research on education, thereby opening up the preservice teachers to considering new models for teaching.

Non-Traditional Teacher Characteristics

Non-traditional teachers share the impact of beliefs and prior experience with traditionally-prepared teachers; however, they appear to differ from their traditional counterparts in at least four areas. These are age and work experience, motives for entering teaching, minority representation, and accelerated progression through Fuller's (1969) Stages of Concern.

Age and Work Experience

Bendixon-Noe and Redick (1995) cited the average age range of non-traditional teacher candidates as from 28 to 57, and traditional teacher
candidates from 22 to 25. At SWU, where the four study participants attended classes, the average age of preservice teachers in the non-traditional program is 34. Degreed preservice teachers in non-traditional programs have often worked in careers that involved their undergraduate majors, for example, medicine, law, engineering, homemaking, business and the military (Broyles, 1992; Kennedy, 1991; Zumwalt, 1991).

Powell and Burrell (1992) found that "the influence of prior experiences and existing knowledge on traditional and non-traditional preservice teachers' pedagogical constructs varied in important ways" (p. 27). Prior experience and prior influences included: the influence of their personal K-12 experiences; the influence of relatives in the teaching profession; work experience, and course work. They suggested a different teacher education curriculum. This curriculum would acknowledge and account for preservice teachers' personal practical experience and knowledge throughout their preservice education program. They also suggested such a curriculum would ultimately help preservice teachers trust their own intuition for preparing and presenting lessons and for using the principles of teaching acquired in their course work.

Motives for Entering Teaching

Motives for entering teaching appear to vary between non-traditional and traditional program students. Though both groups apparently share naïveté about teaching methods, non-traditional preservice teachers verbalize a need to be of service, and to select careers that would add meaning their lives (cited in

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Bennett, 1991). Many have tried substitute teaching as part of their decision-making process and saw using their life experiences as tools for inquiry and problem solving. In Broyles (1988) study, non-traditional teacher candidates saw themselves as more open to change. Additional characteristics of non-traditional preservice teachers identified by Broyles were: acceptance of less need for order, a proclivity to analyze their motives and feelings, a strong interest in observing people, an understanding of how others feel about problems, and a preference for judging people by why they do things, rather than what they do.

**Minority Representation**

Nationally, there are declining numbers of minority students graduating from traditional education programs. Non-traditional programs are seen by legislators and school districts as a way to increase the ranks of minority teachers, particularly in hard-to-fill urban teaching positions. State education data shows that nine percent of teachers and 26 percent of students are minorities (Feistritzer, 1994). Minority representation in non-traditional programs is noteworthy (Dill, 1990; Stafford & Barrow, 1994). Feistritzer (1994) reported that since the inception of the alternative program in New Jersey, 20 percent of the 1,500 teachers certified through the alternative route had been of minority background. Feistritzer (1994) also reported that in Texas, "although 91 percent of all public school teachers are white, minorities represent 43 percent of teachers entering the profession through the state's alternative programs" (p. 137).
Stages of Concern

Bendixen-Noe and Redick (1995) studied personal and professional teacher concerns based on Fuller's (1969) Concerns Theory. Fuller theorized that teachers develop progressively through three stages in their professional growth: (a) concerns about self; (b) concerns about task; and, (c) concerns about impact. Bendixen-Noe and Redick (1995) speculated that age and experience might be a factor in persons moving through the stages. They concluded that education faculty should consider developmental stages in grouping teacher candidates as well as in examining their own developmental stages while working with teacher candidates.

Summary

Personality type theory, as demonstrated by the MBTI, posits that people have preferred modes for energizing, inputting data, making decisions and living in the external world. Personality theory research in relation to education, whether it be students and learning or teachers and teaching, has evolved rapidly in the twentieth century both in education and in educational psychology. Personality characteristics of teachers as they impact teaching have been studied by an increasing number of researchers in the last thirty years. Looking at personality types of teachers and their effect on teaching is in the mainstream of educational research.

Exploring learning/teaching styles of non-traditional teachers is also in the mainstream of recent research that looks to identify the differences and
similarities between traditional and non-traditional teachers. Looking at instructional strategies and media selection resides in body of research that looks at effective teaching models.

In summary, the theoretical assumptions of this study included:

1. Personality type exists and can be identified through instruments.

2. Learning styles are an integral aspect of personality type.

3. Learning styles are developed throughout a life time.

4. Teachers come to the classroom possessing presage variables: personality types, personal learning styles, prior beliefs and experience.

5. Non-Traditional teachers have more fully developed presage variables than traditional teachers.

6. Non-Traditional teachers express reasons for entering teaching that are different, in some ways, than those expressed by traditional teachers.

7. Provided with no direct intervention, non-traditional teachers will teach to their personal learning styles preferences as demonstrated by their selection of instructional strategies and media.
CHAPTER 3

METHODS

Research Design

This multiple case embedded study of four non-traditional teachers and the impact of their personal learning styles on their teaching employed the following methods: interviews with participants and their supervisors; classroom observations documented with a checklist of instructional strategies and media used by the teachers during instructional events; narratives of classroom events; and one videotaped lesson of each teacher.

The study fit the multiple-case parameters because each participant was considered a separate entity with whom the researcher would interact individually at a different site, in an environment of replication (Burgess, Pole, Evans & Priestly, 1994). The study design was embedded because similar results were anticipated, that is, that each participant's selection of instructional strategies and media could be identified and documented. The design also satisfied criteria for being embedded because the initial focus was on the individual participants, not on the site (Yin, 1994). Situational uniqueness was accounted for with the design that included thick descriptions (Guba, 1981). The design satisfied replication logic for a multiple case study. Replication logic
posits that similar results can be predicted for each case (Yin, 1994). Replication is a criteria satisfied in multiple case studies (Miles & Huberman, 1994).

The data were gathered from multiple sources (Lecompte & Preissle, 1993). Interview responses of participants on selected questions were checked against the responses to similar questions by their supervisors for external validity (Guba, 1981). Observations of the participants teaching were documented with a checklist of instructional strategies and media (see Appendices B, C and D). These data were checked through post-observation interviews and member checking of the narrative drafts (Stake, 1995). Videotape tallies of participants using instructional strategies and media in the classroom were checked with peer viewing and tallying of the videotapes. The three methods of triangulation, supervisor interviews, member checking and peer reviews of videotapes, were used to prevent what Glaser and Strauss (1967) identified as too ready an acceptance of initial impressions, while also enhancing the "scope, density and clarity of constructs developed during the course of the investigation" (Lecompte & Preissle, 1993, p. 48).

**Definitions**

For the purposes of this study, the following definitions were employed:

1. Learning Styles: "The composite of characteristic cognitive, affective and psychological factors that serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment " (Keefe & Ferrell, 1990, p. 59).

3. Non-Traditional Teachers: Licensed teachers who completed their licensing requirements in a sequence other than the traditional high school-college-degree-license sequence without interruption, that is, who went through a non-traditional sequence, for example, (a) entered college, graduated, then returned to earn credits for a license after a number of years in another career; (b) interrupted their traditional college track for several years then returned to complete their baccalaureate and licensing requirements; or (c) had no college credits then entered a degree and licensing program as mature adults having worked in a profession or having been full-time homemakers (Feistritzer, 1994).

4. Alternative Program: (a) A graduate teacher licensing program for uncertified persons with at least a bachelor's degree, that offers shortcuts, special assistance or unique curricula leading to eligibility for a teaching credential (Guyton, Fox & Sisk, 1991); (b) a graduate program that accepts candidates with a degree in an area other than education, provides a curriculum that leads to licensing first, and a graduate degree second; and, (c) an undergraduate program designed for mature adults with work experience leading to a baccalaureate degree and a teaching license.

5. Career Changer: (a) A college graduate who worked in a field related to his/her undergraduate degree prior to enrolling in a licensing program; or, (b) a person who had minimal or no college credits before entering a career and
after a number of years returned to college to complete a degree and satisfy the requirements for a teaching license; or, (c) a person with a teaching license who did not use it for a number of years but returned to a university to recertify after another career.

The term *non-traditional* applied to the participants, and to the programs through which they earned their licenses. Those programs were also identified as *alternative*. In addition, the term *non-traditional* referred to the participants, not to their teaching styles.

**Research Questions**

The research questions for this study were as follows:

1. Do the participants select instructional strategies and media based predominantly on their personal learning styles preferences?

2. What other factors, e.g., environmental, administrative, or cultural, influence the participants' choices of instructional strategies and media?

Included in these questions was an examination of the following: (a) What instructional strategies do the participants say they use in the classroom? (b) What media do the participants say they use to support the strategies they use in the classroom? (c) What reasons do they give for their choices? (d) What instructional strategies and media are the participants observed using in the classroom?
Permissions

Prior to beginning the study, the researcher applied for and was granted permission to conduct the study in the local school district. Permission was received first from the university's Institutional Review Board (see Appendix H) that governs procedures for research involving human subjects. Permission was then obtained from the school district's Committee to Review Cooperative Research Requests (see Appendix I). As the study progressed, permission was obtained from the participants, their supervisors and the parents/caregivers of all students to be present in the classes that were videotaped (see Appendices J, K and L).

Study Phases

The design included six phases: Phase One, Identification of participants; Phase Two, Initial interviews; Phase Three, Observations and Validation Interviews; Phase Four, Data Transcription and Coding; Phase Five, Analysis and Triangulation; and, Phase Six, Reporting. Description of the six phases follows (see Appendix N for a synopsis of the study phases).

Phase One: Sample

Criteria established for selection of participants included: (a) personality type/learning style preferences and strengths; (b) completion of licensing requirements as non-traditional teachers; c) age; (d) years of teaching experience; and, (e) grade level of teaching assignment. The criteria was established at two levels: (a) a general criteria which all participants had to fit;
and, (b) MBTI learning styles' criteria which participants selected for each quadrant had to fit. The MBTI was selected as the personality type and learning style instrument because of its prior use in educational research, and its reliability in registering preferences (Lawrence, 1984; McCrae & Costa, 1989; Murray, 1990). The criteria are presented in the sequence in which they were used for selection. A possible participant had to fulfill all the criteria for the first level before being considered for the second and third levels.

First Level Characteristics

Participants were to be (a) 28 years of age or older to reflect the average age range of non-traditional teachers (Bendixen-Noe & Redick, 1995); (b) teaching at the middle school or secondary level in the local school district or in a private school to reflect the researcher's secondary grade level licensing and experience; (c) in the profession for at least two years to account for teacher dropout statistics that indicate most dropouts occur in the first three years of teaching (Maslach & Jackson, 1986); and, (d) career changers to fit within the parameters of the research questions. The participants ultimately selected fit these criteria. They ranged in age from 38 to 52. Two were teaching at the middle school level and two at the secondary school level, all in public schools. All had taught at least two years and all were career changers.
Second Level Characteristics

Participants would be (a) representative of both genders; (b) career changers who had had a career in a field related to the content area they were teaching, for example, engineers teaching math, chemists teaching science; (c) representative of the ethnic/racial distribution in the school district teaching force. One of the four participants was of Native American heritage. The other three were Caucasian. Participants selected included two males and two females. All were teaching in fields directly or indirectly related to their prior careers.

Third Level Characteristics

Criteria for this final level focused on personality type and learning style. In the four learning styles quadrants for which the participants self-reported (see Table 3) they must have scored in the moderate (11-19) preference range or higher for the two functions. Given a choice of participants meeting this preference strength criteria, the next step was to select those who scored with the stronger preferences. The participants were to verify their self-reported preferences in a debriefing interview with the researcher. Participants with reservations about the results of their MBTI would be eliminated from consideration. The researcher expected there would have to be a reasonably-sized pool of at least 50 volunteers from which to select the participants because personality types are distributed unevenly in the general U. S. population who would meet all the criteria (Myers & McCaulley, 1985).
Table 3

Quadrant View of the Myers-Briggs Type Indicator

<table>
<thead>
<tr>
<th></th>
<th>Case One: Art</th>
<th>Case Four: Doris</th>
<th>Case Two: Barb</th>
<th>Case Three: Carl</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ST</strong></td>
<td>SENSING + THINKING</td>
<td>SENSING + FEELING</td>
<td>INTUITION + FEELING</td>
<td>INTUITION + THINKING</td>
</tr>
<tr>
<td><strong>SF</strong></td>
<td>SENSING + FEELING</td>
<td>INTUITION + FEELING</td>
<td>INTUITION + THINKING</td>
<td>INTUITION + FEELING</td>
</tr>
<tr>
<td><strong>NF</strong></td>
<td>INTUITION + FEELING</td>
<td>INTUITION + THINKING</td>
<td>INTUITION + THINKING</td>
<td>INTUITION + FEELING</td>
</tr>
<tr>
<td><strong>NT</strong></td>
<td>INTUITION + THINKING</td>
<td>INTUITION + FEELING</td>
<td>INTUITION + FEELING</td>
<td>INTUITION + THINKING</td>
</tr>
<tr>
<td>Focus on:</td>
<td>Facts</td>
<td>Facts</td>
<td>Possibilities</td>
<td>Possibilities</td>
</tr>
<tr>
<td>Handle these with:</td>
<td>Impersonal analysis</td>
<td>Personal warmth</td>
<td>Personal warmth</td>
<td>Impersonal analysis</td>
</tr>
<tr>
<td>Thus tend to become:</td>
<td>Practical and matter-of-fact</td>
<td>Sympathetic and friendly</td>
<td>Enthusiastic and insightful</td>
<td>Logical and ingenious</td>
</tr>
<tr>
<td>Find scope for their abilities in:</td>
<td>Technical skills with facts and objects</td>
<td>Practical help and services for people</td>
<td>Understanding &amp; communicating with people</td>
<td>Theoretical technical developments</td>
</tr>
</tbody>
</table>

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Given the low number of potential participants ultimately identified for the study, 13 volunteers, the selection criteria for preference strength was met by three out of four participants. The fourth, an SF, had one function lower in strength than the criteria. Her Sensor (S) preference was nine. Quadrant characteristics used throughout the study are found in Table 3.

Following the final selection, participants were asked to identify their supervisors. The supervisors were then asked to participate in the study. To further validate the data, the results of the participants' MBTIs were compared to the international MBTI database that identified the incidence of given personality types in careers including teaching. It was expected that the participants would have degrees in areas similar to those preferred by their personality types as documented in the database, or would be teaching in those content areas documented as having an attraction for their personality types. Career choice data is presented in the findings of each case.

Finally, the selected participants, their supervisors and their schools were given pseudonyms for the study to ensure anonymity (see Table 4 for a participant summary). The first participant, a Sensor-Thinker, was identified as Art, his school as Arlen Middle School, and his supervisor as the principal. The second participant, an Intuitor-Feeler, was identified as Barb, her school as Briar High School, and her supervisor as Dr. B. The third participant, an Intuitor-Thinker, was identified as Carl, his supervisor as Mrs. Coral, and his school as Canyon South Alternative High School. The fourth participant, a Sensor-Feeler,
was identified as Doris, her school as Devon Middle School, and her supervisor as Mr. Delgado.

Table 4

Participant Summary

<table>
<thead>
<tr>
<th>Name</th>
<th>School</th>
<th>Supervisor</th>
<th>Subject Taught</th>
<th>Personality Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art</td>
<td>Arlen Middle School</td>
<td>the principal</td>
<td>music</td>
<td>Introverted Sensor Thinker Perceiver (ISTP)</td>
</tr>
<tr>
<td>Barb</td>
<td>Brier High School</td>
<td>Dr. B.</td>
<td>math</td>
<td>Extroverted Intuitor Feeler Judger (ENFJ)</td>
</tr>
<tr>
<td>Carl</td>
<td>Canyon South Alternative High School</td>
<td>Mrs. Coral</td>
<td>math</td>
<td>Extroverted Intuitor Thinker Perceiver (ENTP)</td>
</tr>
<tr>
<td>Doris</td>
<td>Devon Middle School</td>
<td>Mr. Delgado</td>
<td>math</td>
<td>Introverted Sensor Feeler Judger (ISFJ)</td>
</tr>
</tbody>
</table>

Phase Two: Initial Interviews

Each participant was interviewed approximately five times with the first interview preceding the first observation. Interviews followed some of the in-class observations, and participants were interviewed following their review of initial drafts of the findings. The first interview was a debriefing of the MBTI. The next interview was a semi-structured one based on Caples (1993) (see Appendix E). This interview identified participant demographics and probed their self-knowledge of instructional strategies and media that they used in the classroom. This method of life-history interviewing was used to provide baseline data for the
observations which were to follow (Tabachnick, Zeichner, Adler, Densmore, & Egan, 1982). A listing of instructional strategies and media was used to prompt the interview (see Appendix D). This listing was based on: (a) Gagné and Briggs’ (1974) organizing principle of the Nine Instructional Events; (b) classifications of instructional strategies and media (Caples, 1993; Harrison, 1992); (c) Jungian-based categories of learning styles preferences (Lawrence, 1993; Myers & Myers, 1980; Myers & McCaulley, 1985); and, (d) instructional models used in the classroom (Joyce, Weil & Showers, 1992). This listing was also used as the basis for coding the interviews and classroom observations.

Phase Three: Observations and Validation Interviews

Prior to beginning the study, the researcher piloted the checklist data collection procedures with three teachers (see Appendix M). The first was a university teacher educator and the other two were alternate study participants. The checklist was revised from the original to a grid form for ease of use and specificity (Janesick, 1994).

The participants were observed in their classrooms on at least five different days. Each observation lasted for one or more teaching periods. Researcher time constraints prohibited carrying out the original plan to observe each participant teaching two or more classes of the same grade and ability level in order to triangulate the data. Other methods of triangulation that were employed are discussed in Phase Four.
The researcher used a checklist and narrative comments to tally the participants' use of instructional strategies and media (see Table 5). The checklist was revised again after the first observation, this time customized for each participant, to include strategies and media not originally listed (Lecompte & Preissle, 1993). The original proposal to use an electronic personal assistant for the observations was changed because of problems with software. The Nine Instructional Events (Gagné & Briggs, 1974, pp. 133-134), and the instructional strategies and media categories are found in Appendices B and D.

The participants were interviewed following some of the observations to verify their use of strategies and media, and to explore the reasons for their choices. The original plan to conduct a post-observation interview following each observation was modified because of lack of immediate access to the participants in many instances. Some interviews were conducted by phone with the inherent difficulty of the participants' recalling specific strategies and media used with one class during a long day of teaching. One observation of each participant was videotaped for use in a stimulated recall interview (Copeland, Birmingham, DeMeulle, D’Emidio-Caston & Natal, 1994).

After the observations and interviews of the participants had been completed, the researcher interviewed each participant’s supervisor and obtained permission from each to use interview data for the dissertation. The purpose of these interviews was two-fold: (a) to support documented observations of the participants' regular use of instructional strategies and
Table 5
Classifications of Instructional Events, Strategies and Media Used in Classroom Observations

<table>
<thead>
<tr>
<th>Instructional Event</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. State the objective(s).</td>
<td>Share the purpose of the lesson with students.</td>
</tr>
<tr>
<td>3. Recall prerequisites.</td>
<td>Encourage recall of prior knowledge related to day's lesson.</td>
</tr>
<tr>
<td>5. Provide learning guidance.</td>
<td>Assist students in practicing new skills and knowledge.</td>
</tr>
<tr>
<td>6. Elicit performance.</td>
<td>Prompt students to apply new skills and knowledge.</td>
</tr>
<tr>
<td>7. Provide Feedback.</td>
<td>Share with students how they performed.</td>
</tr>
<tr>
<td>8. Assess.</td>
<td>Evaluate students' achievement of objectives.</td>
</tr>
<tr>
<td>9. Enhance retention and transfer.</td>
<td>Teacher reviews/discusses application to ensuing work.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Instructional Strategies and Media</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>advance organizer</td>
<td>Teacher cues students on content and sequence of lesson.</td>
</tr>
<tr>
<td>announcement</td>
<td>Teacher makes public statement.</td>
</tr>
<tr>
<td>directions</td>
<td>Teacher provides sequenced guidance on next task.</td>
</tr>
<tr>
<td>teacher-led discussion</td>
<td>Teacher controls discussion by bringing it back to himself/herself between student comments.</td>
</tr>
<tr>
<td>learner-led discussion</td>
<td>Students lead discussion with majority of exchanges being student to student, not teacher to student.</td>
</tr>
<tr>
<td>demonstration</td>
<td>Teacher shows students how to do something.</td>
</tr>
<tr>
<td>feedback</td>
<td>Teacher gives oral or written comments on student work.</td>
</tr>
<tr>
<td>gaming</td>
<td>Students participate in competitive activity.</td>
</tr>
<tr>
<td>large-group activity</td>
<td>Entire class participates in activity together.</td>
</tr>
<tr>
<td>small-group activity</td>
<td>Small groups work on activity together.</td>
</tr>
<tr>
<td>humor</td>
<td>Teacher uses jokes to make students laugh or to make a teaching point.</td>
</tr>
<tr>
<td>lecture</td>
<td>Teacher disseminates information orally for an extended time.</td>
</tr>
<tr>
<td>lecture with chalkboard</td>
<td>Teacher lectures and illustrates lesson points on the chalkboard.</td>
</tr>
<tr>
<td>lecture with demonstration</td>
<td>Teacher lectures and shows students how to do something.</td>
</tr>
<tr>
<td>one-on-one work with student</td>
<td>Teacher coaches student individually.</td>
</tr>
<tr>
<td>teacher reads to large group</td>
<td>Teacher reads and students are expected to listen.</td>
</tr>
<tr>
<td>group members read</td>
<td>Students take turns reading.</td>
</tr>
<tr>
<td>question-and-answer segments</td>
<td>Teacher or students initiate questions and answers.</td>
</tr>
<tr>
<td>video</td>
<td>Videotape is used for a teaching purpose.</td>
</tr>
<tr>
<td>overheads</td>
<td>Overheads are used to present/practice lesson content.</td>
</tr>
<tr>
<td>computers-individual work</td>
<td>Students work individually on computers.</td>
</tr>
<tr>
<td>computers-group work</td>
<td>Students team up to work on computers or teacher uses computer to teach class.</td>
</tr>
<tr>
<td>chalkboard</td>
<td>Teacher uses chalkboard to illustrate a teaching point.</td>
</tr>
<tr>
<td>paper/pencil activity</td>
<td>Students complete a written activity.</td>
</tr>
<tr>
<td>musical instrument</td>
<td>Teacher and/or students use musical instruments.</td>
</tr>
<tr>
<td>calculator</td>
<td>Teacher and/or students use calculators to complete math tasks.</td>
</tr>
<tr>
<td>manipulatives</td>
<td>Teacher uses math manipulatives to teach math concepts.</td>
</tr>
</tbody>
</table>

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media; and, (b) to identify any environmental factors that could be impacting instructional strategies and media selection, for example, departmental objectives, access to resources, and school philosophy. This taped interview with each supervisor was conducted using a semi-structured format (Caples, 1993) (see Appendix F).

**Phase Four: Data Transcription and Coding**

Data were transcribed individually for each participant and supervisor in Phase Four. An overall assessment of the four participants was completed in Phase Five, Analysis. This procedure followed standard practice for multiple case studies (Yin, 1993).

Initial coding took place during Phase Four in six general areas, each addressing an aspect of the research questions: (a) identification of personality type indicators of participants; (b) identification of learning styles indicators; (c) identification of instructional strategies and media used by the participants; (d) data demonstrating congruity or lack of congruity with learning styles preferences of the participants; (e) other factors influencing selection of instructional strategies and media; and, (f) data derived from triangulation. The sequence of coding activities follows:

1. Using sources that described personality type characteristics, transcripts were coded for examples and non-examples of each participant's personality type (Hirsh & Kummerow, 1989; Kroeger & Thuesen, 1988; Lawrence, 1993; Myers & McCaulley, 1985).
2. Transcripts were then coded for examples of learning styles preferences indicated by each participant, based on Lawrence's (1993) description of preferences.

3. Data, including that derived from observation checklists and transcriptions of interviews, were then coded for instructional strategies and media used by the participants (Caples, 1993; Gagné & Briggs, 1974; Harrison, 1992; Joyce, Weil & Showers, 1992).

4. Next, participant-stated reasons for use of instructional strategies and media were identified from the transcripts and coded.

5. Instructional strategies and media choices of the participants were compared to the literature on learning styles preferences (Lawrence, 1993) and coded accordingly.

6. Finally, other influences on teaching styles were identified and coded. Among these were administration, resource availability, prior beliefs, prior experience and career choices.

Coding was refined using the constant comparative method (Glaser & Strauss, 1967), and employing Thompson's (1984) model of teacher characteristics. Data gleaned from interviews that differed from or supported classroom observations were documented and described.

Phase Five: Analysis and Triangulation

Analysis proceeded on three fronts: (a) data indicating participant learning styles preferences; (b) relationships between selected instructional
strategies and media, and participant learning styles preferences; (c) additional factors influencing teaching styles. Data analyzed included transcripts of participant and supervisor interviews, observation checklists and narratives, and videotapes. This analysis brought together what Miles and Huberman (1994) called the qualitative-quantitative linkage. The first level is the “quantizing” level where qualitative information can be either counted directly (the number of times a participant uses instructional strategies and media), or converted into ranks and scales (moderate or infrequent use) (p. 42). The second level identified by Miles and Huberman was that linkage between distinct data types, where qualitative information (e.g., from interviews and observations) is compared to numerical data, in this case, results from the MBTI and the learning styles characteristics attributed to given personality types.

Within-case analysis was conducted in an iterative manner attending to what Huberman and Miles (1994) identified as the “distinction between description and explanation” (p. 432). Cross-case analysis was conducted to enhance generalizability (Yin, 1991; Huberman & Miles, 1994).

Participant data were triangulated using supervisor interviews, peer review of videotaping, and member checking (LeCompte & Preissle, 1993; Stake, 1995). Supervisors were asked questions from a semi-structured interview form. The questions reflected those asked of the participants, particularly concerning use of instructional strategies and media. Information was also solicited from supervisors about resource accessibility and school
priorities in terms of curriculum goals and coverage. These interviews provided data that could not have easily been collected by any other method (Borg & Gall, 1983).

Peer review was conducted using the videotape segments of each participant teaching. The peer was given the observation checklist and each strategy and media was explained. No directions were given to the peer in terms of method for tallying, that is, whether to tally individual instances of a participant using a strategy or media, or to tally segments of repeated use. This caused discrepancies in inter-rater reliability (see Figures 1-3).

During a debriefing meeting, the peer and researcher agreed that each had consistently documented participant use of instructional strategies and media in a different manner. The researcher tallied individual segments and the peer documented segments that included multiple instances of a strategy. Figure 4 is an example of a tally reconciled for segment versus incident. The reconciled tally of Case One demonstrated a more accurate view of what was observed by both the researcher and her peer. Because of permission constraints against other peers viewing the videotape, no other triangulation effort was attempted for the videotapes. The final method of triangulation was member checking (Stake, 1995). Three of four participants were given an initial draft of the findings for their case which they were asked to read and edit for accuracy. The fourth participant, Carl, was unable to review his case because of illness.
Figure 1. Peer/Researcher Triangulation for Case One: Art and the No-Teeth Bar

Figure 2. Peer/Researcher Triangulation for Case Two: Barb and the Baseball Stats

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The researcher then met with each participant to discuss their reviews of the findings and to make appropriate corrections. In no case were there major
data corrections. The revisions consisted primarily of mechanical errors in the
manuscript and, in two cases, incorrect data on a participant's age and stage of
progress in a graduate degree program.

**Phase Six: Reporting**

Reporting of the data documented answers to the research questions. These were: 1. Do the participants select instructional strategies and media
based predominantly on their personal learning styles preferences? 2. What
other factors, for example, environmental or administrative, influence the
participants' choices of instructional strategies and media? These questions
implied examining the following: (a) What instructional strategies do participants
say they use in the classroom? (b) What media do the participants say they use
to support the strategies they use in the classroom? c) What reasons do they
give for their choices? (d) What instructional strategies and media are
participants observed using in the classroom?

It was expected that participants would: (a) identify traditional strategies
and media with a high incidence of those described in the literature as described
by their types. (Learning styles preferences of each participant type were
reported and compared against findings); (b) identify media documented as
preferred by their learning styles (Media selection of the participants was
documented and compared to those described in the literature); (c) identify
reasons for their selection of instructional strategies and media similar to those
categories identified by Myers and McCaulley (1985), and Lawrence (1993).
(The participant data were compared to those categories.)

It was also expected that the participants' actual use of instructional strategies and media would parallel those described as preferred by their learning styles. Their actual use of instructional strategies and media was documented.

Finally, it was expected that there would be some impact of environmental influences such as school/departmental goals, and resource availability, on participant’s use of instructional strategies and media. These influences were identified and documented.

Chapters Four through Seven present the findings of the four cases in this multiple-case study. The findings for each case include descriptions of the site and the participant, the latter including personality type and career choice information. The findings are then organized by (a) learning style, (b) teaching styles, (c) other factors identified as influencing choices of strategies and media, and (d) individual case discussion and summary.

The presentation of data “construct by construct” (Strudler, 1987, p. 32), provides a detailed description of fidelity to the learning/teaching styles theory. “Further, it provides a structure for comparing findings across cases” (Strudler, 1987, p. 32).

Each of the four cases studied one teacher: (a) Art, a middle school band teacher; (b) Barb, a high school math teacher; (c) Carl, an alternative high
school math teacher; and (d) Doris, a middle school math teacher. Each teacher represented a different personal learning styles based on the quadrant view of the 16 personality/learning styles as reported by the Myers-Briggs Type Indicator.
CHAPTER 4

Case One: Art and the No-teeth Bar

Art is a wiry young man in his early forties. His slight build belies the energy with which he proceeds through his long day of working with large groups of students. He has thinning blond hair, worn longer than the other male faculty at the school, and a mustache. He has a ready smile and bright eyes ringed with gold wire glasses. His usual attire is casual – chinos, a polo shirt, tennis shoes. Art’s animation in one-on-one interviews, and in the classroom, comes from his face, not his body. He sits on a conductor’s chair most of the time while teaching, and his movements are economical. It is his face and his wit that provide the impression of high energy.

Art is a band teacher whose students include sixth, seventh and eighth graders. He teaches at Arlen Middle School in the northwest quadrant of the city. Arlen follows the Carnegie Council’s middle school plan in philosophy and organization (Carnegie Council on Adolescent Development, 1989). Teachers are teamed for their grade levels, plan lessons together and share information about curriculum and students, something they do during a common prep time. Students go from class to class within their assigned building.
Since this research began in February, the class routine and performance expectations had been well established. Art had adjusted the ability groupings of the classes several times, with pupils moved among various chairs indicating position in the group.

**Personality Type**

Requirements for ethical use of the MBTI include explaining the results to persons who complete the instrument while offering them the opportunity to discuss their concurrence or disagreement with the results. Their self-reported personality type is explained along with preferences of the type as described in the literature. This discussion with the person who completes the MBTI includes Myers and Myers' (1980) words that describe personality type theory: "Briefly, the theory is that much seemingly chance variation in human behavior is not due to chance; it is in fact the logical result of a few basic, observable differences in mental functioning" (p. 1).

The results of Art's MBTI indicated that he is an Introverted Sensor Thinker Perceiver (ISTP). Table 3 highlights some of the characteristics attributed to Sensor Thinkers. During the debriefing of the MBTI results, Art agreed with these results, particularly that he is a hands-on, detail-oriented person. Art fit Myers and McCaulley's (1985) description of the characteristics frequently associated with ISTPs:

Cool onlookers – quiet, reserved, observing and analyzing life with detached curiosity and unexpected flashes of original humor. Usually
Table 4

Quadrant View of Personality Types as Identified by the Myers-Briggs Type Indicator

<table>
<thead>
<tr>
<th>Case One: Art</th>
<th>Case Four: Doris</th>
<th>Case Two: Barb</th>
<th>Case Three: Carl</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ST</strong></td>
<td><strong>SF</strong></td>
<td><strong>NF</strong></td>
<td><strong>NT</strong></td>
</tr>
<tr>
<td>SENSING +</td>
<td>SENSING +</td>
<td>INTUITION +</td>
<td>INTUITION +</td>
</tr>
<tr>
<td>THINKING</td>
<td>FEELING</td>
<td>FEELING</td>
<td>THINKING</td>
</tr>
</tbody>
</table>

**Focus on:**
- Facts
- Facts
- Possibilities
- Possibilities

**Handle these with:**
- Impersonal analysis
- Personal warmth
- Personal warmth
- Impersonal analysis

**Thus tend to become:**
- Practical and matter-of-fact
- Sympathetic and friendly
- Enthusiastic and insightful
- Logical and ingenious

**Find scope for their abilities in:**
- Technical skills with facts and objects
- Practical help and services for people
- Understanding & communicating with people
- Theoretical technical developments

**For example:**
- Applied Science
- Patient care
- Behavioral Science
- Physical Science
- Business
- Community Service
- Research
- Research
- Production
- Sales
- Literature & Art
- Literature & Art
- Construction, etc.
- Teaching, Etc.
- Teaching, Etc.
- Management
- Forecasts & Analysis, Etc.

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...interested in cause and effect, and how and why mechanical things work, and in organizing facts using logical principles (p. 20).
Quietly Observing

Art seldom initiated conversation, speaking only to respond to interview questions. He embodied an often-evident characteristic of ISTPs as described by Kroeger and Thuesen (1988):

ISTPs nature is to be quietly observing, collecting data on all things at all times. They do not think of themselves as watching in order to do something with the information; they are merely scanning the universe because it is part of their nature to want to take in all that is occurring (p. 232).

This total focus and concentration on detail and the immediate task were demonstrated a number of times. In a classroom filled with 80 students Art was always aware of what was going on in all parts of the room. His total focus was demonstrated to me during the stimulated recall interview. I had to repeat questions several times. I finally picked up on the cue that when his hand went over his mouth, he was concentrating on the video and could not hear me. Art exemplified Kroeger and Thuesen's (1992) description of the ISTP as "difficult to read by others and slow to share in public" (p. 325).

Unexpected Flashes of Original Humor

Art's humor was usually evident in one-on-one interviews as well as in the classroom. The following comments took place in the classroom while he was announcing that the band would practice outside the rest of the week to perfect their marching:

Art: Tomorrow we'll go outside if the weather is good. If it's not, we won't because it messes my hair up ... messes my toupee.
Student: Do you wear a toupee (disbelief)?
Art: No ... I wouldn't pay money to look like this!

This dry humor was exemplified again during a post observation interview. When asked if he still played professionally, he said, "Yes, I'm playing weekends at a bar on the outskirts of the city." When I said I might get a group of friends together to go hear him, he said, "It's not your kind of bar — you don't go in there if you have teeth. After a pause, Art grinned and added, "It's a tough clientele."

Collecting Data on All Things at All Times

Art's vocabulary was filled with detail and sensory verbs: "I feel," "I hear," "I see," were recorded 21 times. Bandler and Grinder (1979) and Laborde (1987) cited words such as these as indicative of a sensor as opposed to an Intuitior who might use words such as, "I think," "know," "understand," "guess," and other similar words.

Prefers Facts

Using Myers and McCaulley's characteristics (Table 3), an analysis of Art, the ST, yielded a number of examples true to type. Art's preference for straightforward facts was demonstrated several times in the initial interview.

T: How long have you been teaching?
Art: Full time, this is my seventh year. I substituted three years before that.
T: What subjects do you teach?
Art: Band, or music, whatever you would like to call it.
T: And you teach to all grades?
Art: Yeah, 6, 7, 8.
T: And you've always taught at these levels?
Art: Since I've been at this school.
T: Did you teach at another school?
Art: I was at a sixth grade center. That was sixth grade only ... beginning band.

Later, Art delivered an uninterrupted, straightforward narrative of his start at Arlen as a new school. He remembered vividly, the chaos of that time.

... it was a nightmare, and not anyone in particular's fault because it was a new school. The school building didn't open until a week before school started. I didn't have instruments until October so I had about six weeks of tap dancing for children. It was ... the schedules were way, way incorrect. I had 110 kids in one class ... and only a third of them were actually band kids. We just rallied round the lamppost and really stuck it out. But no one really told me what I needed to do or what I had to do. They just expected you to do it whether it was right or not.

Career Choice Data

Art has an undergraduate degree in music education. He fits the classification of non-traditional or career-change teacher because he worked as a professional musician for a number of years before returning to a university to update the secondary credential he had never used. He earned a masters degree in education after he began teaching. Art is in his eighth year of teaching.

Myers and McCaulley (1985) wrote that "one of the most important motivations for a career choice is a desire for work that is intrinsically interesting and satisfying and that will permit use of preferred functions and attitudes, with relatively little need for using less-preferred processes" (p. 77). They cited the Center for Applications of Psychological Type (CAPT) data bank figures in identifying occupational choices of personality types. In relation to Art's personality type, ISTP, several points were of note (see Table 6).
Table 6

ISTP Career Choice Samples

<table>
<thead>
<tr>
<th>CAREER CHOICE</th>
<th>ISTP % of Total N</th>
<th>ISTJ % of Total N</th>
<th>ST % of Total N</th>
<th>Total % of ST Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td>teaching at all levels</td>
<td>2.0%</td>
<td>11.3%</td>
<td>23.8%</td>
<td>35%</td>
</tr>
<tr>
<td>teaching at middle or junior high school levels</td>
<td>2.3%</td>
<td>11.2%</td>
<td>24.4%</td>
<td>36%</td>
</tr>
<tr>
<td>working in entertainment and the arts</td>
<td>1.9%</td>
<td>5.8%</td>
<td>14.8%</td>
<td>21%</td>
</tr>
</tbody>
</table>

teaching N=16,678
entertainment/arts N=378

Overall, ISTP preferences for careers in teaching and music were low. However, when looking at combined ISTJ/ISTP data, the percents were notable. Thirty-six percent of STs selected teaching at the middle or junior high school level, and 21 percent selected careers in the art and entertainment fields. One could speculate that those in the ST group were a combination of ISTJs and ISTPs, with the Judgers (Js) increasing the percentages. The data supported this. ISTJs selected teaching at the middle or junior high school level at 11.2 percent, and the art or entertainment field at 5.8 percent.

Art started playing at home when he was seven or eight, and professionally when he was 14. He said he had started with lessons at a very early age and that the lessons continued "forever... a long time. Both of my
parents were musicians. We were born into it. That was just part of our lives."

Art is a drummer by profession but played the trumpet in the family group because his brother and father both played trumpet. He said he wasn’t really a trumpet player but had done so because it was a family activity.

A number of studies have identified reasons people have changed careers and gone into teaching (Barnes, 1987; Broyles, 1992; Hawk & Schmidt, 1989; Keltner, 1994). The reasons included a need to be of service, a desire to give more meaning to their lives, an opportunity to use their life experiences as tools for inquiry and problem solving, and an opportunity to use the skills and knowledge learned in their prior careers for a greater good. Finances were also included, but at a much lower incidence than the previous reasons cited.

Art’s career change was driven by finances and by his original plan to eventually teach.

... there’s several reasons and one reason was the work situation here in town with being a musician. It was harder and harder to keep working steady. Financial reasons, a steady paycheck. Family. When I did my undergraduate I always knew that some day I wanted to teach. It’s just that I wanted to do something else first. I had some other goals.

Many non-traditional teachers first experienced a return to the classroom as substitute teachers (Broyles, 1992). Art talked about having gone as far as he could go as a professional musician.

... it was time and there were so many jobs opening up when I was subbing so it was the time to take it and grab the opportunity when it was there and so I took it and ran.
Characteristic of an ISTP, Art had wanted to experience his craft in the professional world of music. His long-term plans had included teaching, in part because of his respect for his mother, a teacher, and for other teachers in his high school.

Oh, I knew as soon as I went to college. I knew I did ... I still knew I wanted to do it [teach] but I wanted to do the professional thing first. Because I had the talent to do it and I had the opportunity. Once again, the opportunity was there. I did it first. I wanted to do that before I started teaching because I knew it would be real hard to quit that and go and do my professional stuff. But I always knew I wanted to teach.

Although Art's first professional career was as a musician, he said he had long had plans to teach as evidenced by his undergraduate major and his return to the classroom as substitute. His preference for learning by experience, and his personal financial situation, led him first to the professional music world and then to teaching. The former was illustrative of his personality type description.

**Learning Style**

**Preference for First-Hand Experience**

Dominant throughout discussions with Art was the worth of his prior experience in learning the music industry first hand in order to teach it. Kroeger and Thuesen (1988) noted that "learning is most enjoyable for the ISTP ... when it is relevant and experiential. The ISTP believes that the only way to learn is by doing" (p. 233). As he talked about his previous professional experience and how it contributed to his effectiveness as a teacher, Art said:

A lot of it is experiences that I've had, with me being a musician and being a teacher [have contributed to my teaching]. A lot of the musicians I've
worked with, experience. Because I traveled on the road about ten years before I finally lit here ... a lot of those experiences of just traveling and playing with different people... learning how to get along with people you really didn't want to get along with [were helpful]. And all of a sudden you're making a lot of money and you have to live in a hotel room with someone you don't really like. That's the way the gig went so you did it.

Art emphasized that these experiences on the road had become key not only to managing large groups of students, but also to helping them get along with their peers.

In talking about his future goals, Art's comments were strongly reflective of the learn-by-doing ISTP. He said that he wanted to go on doing what he was doing and:

... continue the improvements that I need to make in myself personally and professionally that I haven't reached yet. Not to say that I'm a perfectionist but obviously we can all get better over time at what we do and I want to keep learning. I tell the kids all the time: 'I learn as much as you guys do. It's an amazing game watching you kids.'

Art's preference for "first-hand experience that gives practice in the skills and concepts to be learned, concrete learning experiences" (Lawrence, 1993, p. 43) was described by his principal:

He books as many ... and he calls them gigs ... books as many gigs as possible for the band, you know, places for them to perform, whether it's a shopping mall, an opening for MacDonald's or something like that. He always makes sure they have at least one parade to march in so they have that experience.

Lawrence (1993) noted that Sensors "believe the adult world has specific skills and facts they [students] should be taught and are disappointed in any teacher
who expects them to discover them for themselves" (p. 44). Again, Art’s
principal gave evidence that this view of learning was part of Art’s style.

He’s about giving them as many experiences related to music as possible
in the middle school level, so that when they get to high school, or
approaching high school, they can determine whether they want to
continue with music as a focus through high school, maybe on through
college or as a career, or if they just want to use it as a vehicle to
education.

Preference for Hands-On Activity

Lawrence (1993) identified instruction “that fits S’s... and T’s” (pp. 42-46).
That instruction included: hands-on labs, materials that can be handled, first-
hand experience that gives practice in the skills and concepts to be learned,
concrete learning experiences, skills and facts they can use in their present
lives, teachers who show them exactly what is expected of them, and teachers
who provide concrete learning experiences first in any learning sequence,
before using the textbook.

Art’s preference for “hands-on labs and materials that could be handled “
(Lawrence, 1993, p. 43) was demonstrated by his comments about computer
use. He said that he and his aide had one in the office that they used for records
and one in the band room they used for sequencing and programming music.
They did not, however, use them with the students because he felt their limited
time was better spent playing their instruments.

... we always talked about it too, but we don’t have the time for that.
Because if they’re sitting at a keyboard they’re not playing their
instrument, and basically they need to play their horns as much as they
can to progress to the level that I want them to be at.
Preference for Real-World Application

Art himself talked about the positive carry-over of learning music a number of times. Of note were the following comments that related his beliefs that skills learned in music carried over to the future.

I would also tell parents that the discipline they learn in music can be applied to all their other classes and you know there have been studies done that people who are in residence and who are creative in the arts have a little higher perception of how other classes work. They usually run a little bit better on their standardized tests... a little bit higher. And so I would stress that with them. That a lot of the stuff we do in there can be carried over to other classes. It's a very disciplined atmosphere.

They are consistent with Myers' (1993) description of the ISTP as a realist “focusing on what is and what can be done with it, rather than on theoretical possibilities” (p. 16).

Teaching Style

Findings on Art's teaching style begin with a description of his teaching environment and students and of the data collection procedure. These descriptions are followed by a delineation of the instructional strategies and media observed during nine instructional events. Data on the participant's teaching style includes interviews with him and his supervisor, classroom observations and post-observation interviews, and information from a peer who viewed a videotape of the participant teaching a lesson for the purpose of triangulation.

Environment and Students
I observed Art for ten periods, for a total of nine hours, over a ten-week time frame. The classes were the first period symphonic band that met at 6:30 AM, and the second period intermediate band that met at 7:30 AM. Because the ensembles were grouped by Art’s criteria of ability levels as well as cooperation and personal discipline, they included a mixture of grades. The symphonic band was the most advanced and included predominantly eighth graders.

The first period symphonic band included 68 Caucasians, six African-Americans, three Hispanic-Americans and four Asian Americans, with girls making up half of the class. The second period intermediate class included 16 Caucasians, four African-Americans, three Hispanic-Americans, and two Asian-Americans with gender also evenly divided. Art described the intermediate band as made up of students who were still learning their instruments and/or who were working on the discipline necessary to become good musicians. The symphonic band, he noted, were more polished musicians working on blending together their sounds.

Data Collection Instruments

I observed Art and recorded observation data using: (a) checklist that was all-inclusive of strategies and media that might be found in any middle or secondary school classroom (see Appendix B), and organized by Gagné and Briggs' (1974) Nine Instructional Events (see Appendix D); (b) a classroom diagram to document room arrangements and student demographics (see Appendix C); and, c) a notepad for field notes. Each time Art used an
instructional strategy or a medium, I stroke tallied it on the checklist noting during which instructional event the strategy or medium was used. I used the notepad to document quotes and to describe classroom environment. After the second observation, I revised the checklist to reflect Art's dominant strategies and media and to include some not previously included, for example, Art's play-along strategy and his stopping to fix student instruments (see Table 7 for the checklist summary). Wherever possible, the observations were followed by post-observation interviews to elicit additional information strategies and media used during the class period.

**Gaining Attention**

Art had noted that by the second semester, the classes were task-oriented and needed little management. I noted 22 instances of strategies used in the first instructional event of Gaining Attention. The majority were announcements. He used humor four times during this segment, mostly preceding and following the Easter break when he said the students were quite restless. Several announcements were greeted with quiet. Art said, "Lots of zombies around here," as he walked around encouraging individuals to wake up. As he conducted the first piece after vacation, his stick flew out of his hand. "Give me that," he said. "If it had been a little longer it would have gone into the horn. I've done that in concerts."
Table 7

Checklist Summary of Case One Instructional Strategies and Media

<table>
<thead>
<tr>
<th></th>
<th>1 gain attention</th>
<th>2 state objective</th>
<th>3 prereqstimulus</th>
<th>4 provide guidance</th>
<th>5 elicit performance</th>
<th>6 feedback</th>
<th>7 assess</th>
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<th>% of total used*</th>
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*N=446 Total number of instructional strategy and media use incidences tallied

In response to a question about teaching strategies, Art had said he used advance organizers, a technique he had learned as a preservice teacher.

Well, the part about ... before the class starts I always tell the kids about their objective for the day or the week or whatever words ... goal for the week. And I basically still do that. That was pretty much drilled into our head and I still do that as much as I can. I mean I don't do that every day. I should because I that that's something that's good. Because I think the kids want to know what you have planned. And I still do that one for the most part.
I observed Art use advance organizers only twice, both times having to do with future events such as beginning marching outside the following week and preparing for a trip to the regional band competition. His announcements and directions were generally for the next piece to be played, not for the day's lesson. Though he thought he was using advance organizers more often than he was, Art was behaving in a characteristic ISTP fashion, more focused on the here and now, in a rhythm of announce-play-feedback. What there was of future/advance organizers tended to be assignments written on the board for the following week or two. He talked about how his classes have a similar format:

There's a predictability of when it starts and when it ends. But the middle ... even though I know what I'm doing, the kids may not know what I'm doing because sometimes we have to change our direction by what happened.

During several class periods, Art stopped the band to work with sections on improving their technique. He said he hadn't particularly planned to do so, but the students were having problems obvious to him. He worked with sections such as wood winds, percussion and brass for extended periods. This happened more often in the intermediate class.

Art regularly inserted segments of music history into his lectures, often in humorous manner. He noted that the students seemed to enjoy it.

... that's why I like this series of books because they have classical composers in there. They just take excerpts ... obviously it's not their full works ... because this is Franz Schubert's March Militaire is what this one is. Their book has all the lab stuff and mine has all the details about the composers and I try to fill those in at least every once in a while. And I have my own jokes and I did the same twice.
Stating Objectives

Art usually stated objectives with directions or announcements. Typical comments included: “Let’s do some stuff we haven’t done for a while.” “Get up the Don Marco thing. All right, let’s do it. Please don’t disappoint me.” “All right. Let’s get warmed up. Let’s play.” “Let’s start with scales.” The only times I heard him talk about what would come next in the class were when a student would ask if they could play a certain piece. Art would answer that they could if they had time or if everything else he had planned went well.

Prerequisites

In the Prerequisite event, there were only two stroke tallies. One was an announcement reminding students about how the piece had been played the day before, and one was a brief lecture on how a piece should be approached. When I commented that he very often used the student suggestions on what piece to play, Art noted:

Yeah. If we’ve covered what I needed to cover and what I think we should have and they’ve done it well, if they want to suggest, OK. I’ll do it as long as they can play it. You know, I’ve always figured, if they want to do it, even if it’s something they’ve more or less mastered and they play fairly well, every time they play it they’re going to get just a little bit better.

Prestimulus

The Prestimulus segment and the Providing Guidance events tended to run together, immediately preceding the Performance event. Only one announcement was noted for both of these events. Directions were given 17
times in the Prestimulus event and 12 times in the Providing Guidance event. Of note during the Providing Guidance event were thirteen instances of small group work with individual sections of instruments, 18 instances of humor, 21 brief lectures, and ten lecture-demonstrations. Art used a question and answer strategy five times.

Art’s planning and classroom strategy included ongoing rotation among the percussionists:

When I have a larger group of percussionists ... I teach them mallets and the bells, and they rotate, so one day they play mallets and then another starts the base drum parts. And then the next day the other group plays mallet and the ones that were playing the mallets can start playing the base drum parts. So they're always rotating and playing different instruments.

The stimulated recall interview yielded additional information on Art’s teaching strategies. I commented on his starting every class with scales and asked if he ever did an entire class with just scales. He replied:

No. At the very beginning of the school year, like the first three or four days we start playing, we spend most of the time on reviewing scales. Obviously not with the beginners but with the kids who have already played ... reviewing their scales and doing the warm up chorales and things like that. But yeah, I try not to do the whole period.

Art tended to use brief vignettes from his career as a musician during the Prestimulus segments. He felt it important to share his professional experiences with young musicians if the moment and situation were appropriate.

Eliciting Performance
The highest number of strategies was observed during the Eliciting Performance event. Seventeen announcements identified pieces to be played, and 26 directions were given for playing. The entire group was asked to play 60 times during the weeks that I observed.

Art played along with the groups 23 times, usually on trumpet or drums, but occasionally on woodwinds, particularly if students in the woodwind section were having difficulty with a piece. When I asked how he had selected the strategy of playing along, Art replied, "It's to give strength to instrument groups who need it."

Art gave feedback two times prior to this event, requested small-group performance ten times prior to conducting the entire ensemble, and incorporated humor into this section six times. Art lectured briefly in this segment, usually reminding students of a point of technique prior to beginning the piece and demonstrated along with a lecture twice.

Feedback

I observed sixty-eight instances of Art giving feedback. He used a number of strategies for this instructional event. These included eleven announcements, six directions, eleven demonstrations, six direct comments on performance, seven instances of humor, seven comments to small groups, fifteen lecture/demonstrations, two question and answer sessions, and two chalkboard sessions. His humorous remarks during feedback included:
"The look on you guys' faces – thirteen parts instead of one."

"Once again, I don't know much about music, but MP [musical notation, mezzo piano] – the way you played it sounds like mighty powerful".

"You're good [to a struggling drummer]. That's why I've kept you around all these years."

"I don't know what Star Trek you've been watching, but it isn't the same one I've been watching" [after a weak rendition of the "Theme from Star Trek"].

The principal felt that Art's sense of humor was the most important aspect of his teaching style. She noted that he had a good rapport with the students and that they really related well to him, saying "And I know it's from the sense of humor and he just manages through that use of humor to pull all kinds of things out of students."

During the initial interview Art talked about teaching strategies and media he might describe to parents at an open house in terms of building confidence and self-esteem:

You know I try to get them to leave the room with something positive. I don't care how bad the day was, they may play, or how bad the band played or how bad I was. It really doesn't matter. When they leave they have something positive and that they were glad they showed up for that day.

When asked if he could pinpoint or describe some of the strategies he used to build confidence or self-esteem, Art described his no-nonsense but caring approach to feedback.
Just small things I say. You know I'll be getting ready to count off a song and I'll say, 'You know this will be a little bit hard, but as good as you guys are, this will be a piece of cake.' Just small things like that. Because I'm not really one who stands up there and preaches 'you know you're the best thing that ever happened.' I'm not like that and I don't do that and I tell the kids that I'm not up there to stroke them and they don't expect that. But just small things like at the end of class, a pat on the back. A lot of times instead of saying something when they get done playing, I'll applaud, just myself, and they know what that means. Small things. Nothing real major, just small things.

Art's attention to detail came through in his next comment when he continued speaking about feedback.

I try to vary it so it's not the same every day. I did catch myself, and other people have caught me ... you know they'll play something and I've caught myself saying 'very fine.' After 30 of those in a row, it doesn't mean anything any more.

Direct Assessment

Direct Assessment was ongoing, if defined by the criteria of Gagné and Briggs (1974):

How can it be known when a student has performed satisfactorily, or attained mastery, on a test applicable to any particular objective? The student needs to be told he was successful, so that he can then move on to work toward achieving the next objective he chooses or has assigned to him. In case he has not been successful in attaining the objective, the teacher needs to determine what remedial instruction is needed (p. 165).

Feedback was the evidence of Assessment that was the most common of Art's strategies. Direct Assessment occurred twice. The first time was when he announced the new assignments for chairs, midway through the semester. There was some movement among members of the two classes, based on the criteria that Art had established of self-discipline and cooperation, along with playing
skill. He said, "You all did well on your test last week. Some of you have moved up and some back." He explained that moving chairs was to motivate and no one seemed visibly disturbed by the change.

The other direct Assessment took place when he moved among the various groups, taking turns sitting in a chair with each group as they played. When asked why he did this, he answered, "I can hear what they're playing better and detect problems within sections." He said that he did it occasionally when the situation warranted it because he "can't detect the problems otherwise." Other than that, there was no direct assessment where Art actually noted that a piece was now played perfectly and the group would move on to a new one.

**Triangulation**

Two methods besides observations and interviews were used to triangulate the data – peer viewing of a videotape of Art teaching, and Art’s reading of the case manuscript. The results of the videotape triangulation were mixed. The largest disparity was with the strategy of announcements. She noted one while I noted 12. The strongest comparison point was the play-along strategy with her noting 13 instances and my noting 14. In discussing the mixed results with the peer, we realized that she had tallied segments and I had tallied individual instances of strategies and media use. The peer and I agreed that a segment typically included three to five instances of a strategy used in quick succession, and that our tallies were quite close if either clustered into segments.
or counted as individual incidences. Announcements and directions were examples of segments that she tallied as one and I tallied individually.

After the case was documented, Art read it. He made corrections to the manuscript having to do mostly with music terminology and personal data. Noting that I had “captured his teaching accurately,” he said the one surprise for him was my description of his use of humor as an instructional strategy. He said he considered himself “a clown” and knew he used humor, sometimes with a specific point in mind, but never thought of it as a strategy. He also laughed and related that his wife did not consider him “wiry” as I had described him, but he thought he was.

Other Factors Influencing Teaching

The potential influences on teaching strategies such as (a) education, (b) administration, (c) resource accessibility, (d) experience, and (e) prior beliefs, were all noted with varying degrees of importance.

Influence of Education

Teacher education courses did not appear to have a significant influence on Art’s teaching. Art had little recollection of his education-related coursework. In discussing how and when he had received his teaching license, he said:

Yes I did get a teaching license in [his home state], but I never used it. Actually the only reason I got the teaching license was when you graduated they did the thing where you sign up right then and there as part of the graduation. I got it but I never used it.
I asked if he had to go back to school to get a license in this state and if so, what courses he took. Art replied, "Yes, I did. I had six credits to get... continuing Ed... I'm not really sure." Of other courses he took, Art commented, "One of them was multicultural education. There were three more that I had to take ... I don't remember ... it was just to make my license current."

Art talked about the type of in-classroom experience required at his undergraduate university, and whether he had a practicum and/or student teaching. He said,

Both of those. I don't know if they called it a practicum. We called it an observation ... Same thing, I guess. We had to spend one quarter at an elementary school and one quarter either at a middle school or high school. Back then it was a junior high. And then we did our full semester of student teaching ... more than a ten-week quarter.

Influence of Administration/Supervision

Art had total administrative support and autonomy from his principal. She placed implicit trust in Art's teaching abilities and results, observing him because of his skills, rather than to give developmental feedback.

I have observed him. His teaching style...he requires a lot of the students. He requires them to practice. He requires them to use their books on music theory and learn theory. For instance, his drummers all have to learn how to play bells, which is the equivalent of learning a piano keyboard, and all have to learn how to play that before they ever get to use their drums and the drum pad.

Another example of the principal’s trust in Art’s teaching were her comments that:

He’s extremely well-organized. He’s knowledgeable. He’s been doing it long enough that he really has it down to a fine science. He really knows
how to take those children and ... a lot of it is just inborn talent, but I mean, you grow professionally and you learn as you go along. But I can tell you that the whole [three] years that he’s been here he’s been like that the whole time and he just keeps getting better.

When asked if, when Arlen was new, he was allowed to teach any way he wanted or whether there was anything he was encouraged to do as a teacher in the classroom, Art responded:

Not that I recall. We were pretty much left on our own... at least I was. I don’t know. ... because we do the teaming thing here and the teams do their stuff and we’re really not part of the teams. We kind of are but we’re not really. Because there’s eight teams and I have all eight teams throughout my day and throughout my classes, so we’re not really team members. But I think the teams were pretty much in the same direction. I think that was pretty much a part of it then. But I think that as elective teachers, they pretty much figured that we knew what we were going.

Availability of Resources

Availability of resources had a positive impact on Art’s teaching strategies and media. He and his principal both noted that he had the majority of resources he needed available to him. The school was well funded and there was a great deal of community support for any fundraising activities to purchase material for the band. As noted earlier, Art mentioned his desire to have more guest musicians play for his classes, something that would be possible when the school went back on regular scheduling.

The Influence of Prior Experience

The impact and importance of Art’s prior experience was reinforced by the principal’s observation that:
I think he approaches music differently than teachers who haven't had a career change. As a professional musician he knows what it's like. He knows that it's important for children to not just know how to play music but to develop a love and appreciation for music and to realize their options. He knows to tell them about scholarships. He knows to tell them it's a ticket to something else. He will hang around after school and just play with kids. They improvise. They just kind of hang out and have a good time.

Art himself spoke of the impact of his prior experience on his teaching a number of times. At one point I noted that there were a lot of life skills he was communicating to the students. He said,

Yeah, I do whether they want to hear it or not. Sometimes they go 'Oh no, not another one of those band stories.' I say, 'Yeah, now listen to this.' But you know it's ... you know some times I look back and think I wish I had someone to say those things to me that I've told these kids. Different things. But I don't know. Kids talk about that kind of stuff. And I think a lot of them appreciate what I tell them. But I tell them any way. And I tell them sometimes, 'I'm going to tell you this whether you want to hear it or not.'

**Influence of Beliefs**

Art spoke a number of times about his belief that establishing caring in a classroom was important. He also spoke about the positive impact of band participation on the students:

You know this thing of just being around the kids and interacting with them ... I think I have a pretty good rapport with the kids. I enjoy having the opportunity to help some of them and keep them off the street. Because I've got kids that if it wasn't for what they're doing in there [band] they'd be in the wrong place. And that's more gratifying to me than trying to teach them all to play instruments and that. There's a few of them that would be on the wrong side of the railroad tracks if it wasn't for myself and Mr. [band teacher peer] and Ms. [choir director].

Later in the interview, he spoke of the trust students have in him because he listens to them:
I listen a lot. Yeah, I know I listen and a lot of them tell me things I sometimes don't want to hear, but sometimes I'm the only one they have to talk to ... that's because they trust me, and they should. I'm on your team. I'm on your side. Like I tell the kids, 'We're all Bozos on this bus and we all sink or swim together in this kind of organization.'

According to his principal, Art spends a great deal of time outside of class helping students with their playing skills. Art spoke of two students who were having problems mastering their instruments. One in particular, Jim, was a constant source of coaching attention for Art:

Jim's always behind. He's a little slow anyway. I guess that happens. Eye/hand coordination, his reading or his concentration level - he's always a little behind but he's a good kid and he tries. He's never going to be Buddy Rich. That's never going to happen, but he obviously gets an enjoyment out of doing what he's doing and you know, he doesn't cause me grief or anything.

Art's care for students' feelings was evident as he spoke of how he used audiotapes of judges' comments from musical competitions.

I listen to the tapes first and screen them to make sure the judges say what I think is not demeaning to them. Because some of the judges every once in a while ... this past year those guys were real good. Their comments were critical but they were positive. We've had some judges before where they were just put downs and I won't play those guys. Whether it was right or wrong, there's a way to say something. And I just won't play those ... but I always go over them first to make sure they're OK, and, if I feel they're OK for the kids, I'll play them for them. If not, I won't.

Art believed strongly in establishing boundaries, "rules," and in the benefit of rules for the students. When I noted how respectful the students were and how little time he had to spend managing order or discipline, Art noted that classroom management started in the sixth grade with the beginners. It was
there he set up a “game plan” that carried over to the seventh and eighth grades:

I’m setting the rules and they’re deciding if they’re going to play by my rules or not. And once you get the first year done, actually the first half of the first year, then the boundaries are set and they know where they can go and where they can’t go and ones that don’t want to do that ... they go elsewhere ... So a lot of it carries over from the sixth grade and being pretty restrictive in the first year, actually all the years. You know I’m pretty straight ahead with what has to be done. And there have been several students that have mentioned to me that I’m the strictest teacher they have, which they like. And I guess I am. I don’t know, but I still get paid, so ... [laughs].

When I commented that I hadn’t seen him having to discipline anybody in any of the classes I had observed, he said:

No, you really don’t. You know kids are going to be kids and there’s going to be things that happen. And every once in a while someone’s going to run, or somebody’s going to throw something across the room. I mean that happens. I don’t care who you have. That’s going to happen. But basically, this is the general classroom discipline. It’s usually pretty good, but it’s something I established as sixth graders. And I basically don’t cut those kids any slack the first year. It’s pretty narrow. You know, it’s my way or we don’t do it any way. You can go elsewhere but it’s good.... And you know, you’ve read the same things I’ve read. A lot of kids want that. They want that structure because they don’t get it at home.

Summary

Figure 5 summarizes Art’s use of instructional strategies and media during eight instructional events observed. As noted before, the ninth instructional event, Enhancing Retention and Transfer, was not observed. Art’s predominant strategies were announcements, directions, and lectures, followed closely by demonstrations and small group work.
Art used advance organizers only four times. He used 55 announcements throughout all the instructional events. Directions were his most frequent strategy, totaling 68. The next three most frequently used strategies were 60 incidences of large-group work, 57 lectures, and 47 demonstrations. Art gave feedback 23 times, worked with small groups 35 times, gave lectures with
demonstrations 13 times, and used humor 20 times. Art's use of media, other than the instruments that were key to this class, was minimal. He used the chalkboard three times and the tape recorder and metronome each once.

Discussion

Myers and McCaulley (1985) identified type differences in teaching styles. For the Sensor Thinker they detailed six characteristics, most of which were consistent with Art's teaching/learning styles. They are: (a) the role of the teacher; (b) curriculum planning; (c) lesson planning; (d) teaching; (e) evaluation/assessment; and (f) criteria for success.

Role of the teacher. "The role of the teacher is to set an example for students, be a role model, and share knowledge and experience" (Myers & McCaulley, 1985, p. 235). Art noted the importance of modeling positive adult behavior for the students a number of times. He knew that for some students, there was no one they could talk to other than him, and he took the role of confidant seriously although with reticence. Art talked about how he shared with students not only techniques in music but also interpersonal skills. Both of these skills he directly attributed to having realized his desire to work in the world of music before teaching it.

Curriculum planning. Art was knowledgeable about state and regional competitions and what it took to compete at those levels. With this in mind, he structured his classes for students to grow in the skills to showcase their progress at state and regional levels. Art used textbooks as the basis for theory
and music history, requiring regular weekly assignments from the students. His professional experience was constantly in evidence in anecdotes and in techniques he shared with the students. Art's curriculum planning was consistent with that of the Sensor Thinker as described by Myers and McCaulley (1985): “Ideas for teaching come from state and local curriculum guides, textbooks, and experience” (p. 235).

**Lesson planning.** Although Art planned his classes well in advance, he also demonstrated a skilled flexibility for dealing with actual student performance, while managing to cover the planned content. He talked about planning the beginning and end of his classes but letting the middle go where it had to in terms of what the students did that day. Myers and McCaulley (1985) cited Thompson's (1984) observation that for the Sensor Thinker, “Teaching is planned by making complete detailed plans in advance for year and term with specific objectives” (p. 235).

**Teaching.** Art's heavy use of directions and announcements was congruent with the description of his teaching style. Myers and McCaulley (1985) described the Sensor Thinker's method of teaching as “following daily routine, directing activities” (p. 235). Of all the strategies he used, directions were the dominant ones. His daily routine included work in scales, the extent depending on the level of the group. His principal noted that he required a lot of the students including learning music theory, and that he expected the
percussionists to learn to play the bells, the equivalent of a piano keyboard. She also felt that he approached music differently than:

... teachers who haven't had a career change. As a professional musician he knows what it's like. He knows that it's important for children to not just know how to play music, but to develop a love and appreciation for music and to realize their options.

**Evaluation/Assessment.** In this characteristic of teaching, Art differed from the behaviors cited by Myers and McCaulley (1985). They noted that "Students' work is evaluated by using points and percentages in a systematic way" (p. 236). His evaluation included individual assessment of student proficiency with an instrument but also included other behaviors such as professionalism. Art described professionalism as including completion of written assignments, cooperative behavior during class, correct posture, and having instruments and music books in class every day.

**Criteria for success.** Art's focus was constantly on student improvement rather than on perfection or total proficiency. Myers and McCaulley (1985) noted that the Sensor Thinker teacher "feels successful if student grades and behavior improve" (p. 236). Once having established the rules and boundaries of the class, Art looked for students to observe those rules and boundaries and to try to improve. Any sign of improvement brought gratification for Art. His aide noted that it was "easy to get an A in this class" if students were cooperative and did their assignments. She validated Art's comments that he looked only for
progress. His patient work with the intermediate band and his celebration of progress within that group, no matter how small, supported his statements.

Conclusion

From the data collected, it would appear that Art, the band teacher, is true to his learning style in his teaching (see Table 8). With no constraints from administration or from lack of resources, Art teaches in Sensor Thinker fashion as described by the literature (Lawrence, 1992; Myers & McCaulley, 1985). Art’s preference for hands-on experience was evident on a regular basis and his inclusion of real-world experience into lectures and vignettes was of great importance to his view of teaching. His “unexpected flashes of original humor” (Myers & McCaulley, 1985, p. 20) were central to his relating to the students in terms of motivation to improve performance. Art well fit Lawrence’s (1992) description of the sensing type teacher who tends to “emphasize facts, practical information and concrete skills” (p. 20). Finally, Hirsh and Kummerow’s (1989) description of the ISTP’s view of school and schooling, reflects Art’s path to his current career:

The formal or traditional school setting is not as important to the ISTPs as is the opportunity to increase their own practical knowledge. Nontraditional programs or approaches often attract ISTPs, especially when they can learn about things they see as vital and central to their interests (p. 88).
### Table 8
Examples of Learning/Teaching Styles Data from Case One

<table>
<thead>
<tr>
<th>Art's (ISTP) Learning Style Preferences (from Lawrence, 1993)</th>
<th>Example</th>
<th>Art's (ISTP) Teaching Style Preferences (from Lawrence, 1993)</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likes teachers who provide concrete learning experiences first in any learning sequence before using the textbook.</td>
<td>Played music from his early years learning from family members before taking lessons.</td>
<td>Ideas for teaching come from state and local curriculum guides, textbooks, and experiences</td>
<td>Uses curriculum guides and aims toward entering state and local competitions with the band; uses textbook as a review after skills have been presented and practiced.</td>
</tr>
<tr>
<td>Linear learner; likes having a plan and sticking to it.</td>
<td>Made a career plan and stayed with it until he had achieved in the musical field and moved on to teaching.</td>
<td>Teaching is planned by making complete detailed plans in advance for year and term with specific objectives.</td>
<td>Has goals for students with specific objectives but adjusts them according to student proficiency.</td>
</tr>
<tr>
<td>Likes direct experience, lectures, audiovisuals. Prefers hands-on work.</td>
<td>Has played music since he was a small child and continues to play professionally.</td>
<td>Typical method of teaching is described as following daily routine, directing activities.</td>
<td>Has a plan for the day and carries it out with numerous directions and announcements.</td>
</tr>
<tr>
<td>Like teachers who show them exactly what is expected of them.</td>
<td>Always preferred classes and music lessons that had clearly-stated objectives.</td>
<td>Students' work is evaluated by using points and percentages in a systematic way.</td>
<td>Evaluates using a number of criteria he presents to students early in the year. Include attendance, professionalism, effort, and completion of written work.</td>
</tr>
<tr>
<td>Do best work with feedback that shows them their specific, objective achievements.</td>
<td>Works with principal to achieve specific school goals; sits in on practice sessions with peers and students who give him feedback on his playing.</td>
<td>Teacher feels successful if student grades and behavior improve.</td>
<td>Is equally concerned with living skills and music skills improving in students.</td>
</tr>
</tbody>
</table>
CHAPTER 5

Barb and the Baseball Stats

Barb is a high school math teacher at Brier High School in the southwest quadrant of the city. Brier has been open for six years and the student population has already outgrown the facilities. Barb's classroom is in a mobile unit, one of ten double units parked next to the gym. To reach the main classroom buildings and administrative offices, one has to go around a wide classroom building or through a large inner courtyard. The school is in another rapidly-growing section of the city. The area immediately surrounding Brier is predominantly upscale apartments on two sides and vast empty fields on the other two sides. About a mile down the main road there are multiple housing tracks in the mid- to upper-scale range.

Barb's self-possessed, business-like manner on the phone, and her brief description of herself, gave me a clue to her persona. I had no trouble identifying her when we met at a coffee house near the school on a Saturday morning. She is in her late thirties. She wears gold wire-rimmed glasses and little makeup. Her posture, walk and obvious good physical condition gave the appearance of regular exercise. She confirmed that later by saying she worked out as often as she had a chance.
When I asked Barb how much time we had for the interview, she responded with a comment that very much came to embody her for me: “I have to meet my mother and daughter in an hour. We're shopping for an Easter dress for Bettina [her daughter].” Family was always a priority for Barb. She shared with me that her daughter was adopted from a European country and that she and her husband were in the process of adopting another child.

**Personality Type**

Barb self-reported as an Extrovert-iNtuitor-Feeler-Judger (ENFJ), results that she confirmed early in the interview when we discussed her personality type. Myers (1993) wrote that ENFJs: “focus on others’ growth; demonstrate energy and devotion; demonstrate warmth, compassion and support; assume responsibility for harmony in interactions” (p. 23). Barb demonstrated these characteristics a number of times. Table 3 provides a synopsis of characteristics attributed to Intuitor Feelers.

**Focus on Others’ Growth**

Barb's sharing her adoption information with a relative stranger was indicative of the strong Feeler in her personality type as described by Myers (1993, p. 23). Also, Barb said she knew I had had problems identifying an NF for my study and wanted all the constraints out in the open, lest I be disappointed. This people-centered characteristic of ENFJs was described by Kroeger and Thuesen (1992) as a “focus and direction ... toward other people and ... highly skilled in understanding others’ needs and motivations” (p. 272).
Table 3

Quadrant View of Personality Types as Identified by the Myers-Briggs Type Indicator

<table>
<thead>
<tr>
<th>Case One: Art Doris</th>
<th>Case Three: Doris</th>
<th>Case Two: Barb</th>
<th>Case Four: Carl</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ST</strong> SENSING + THINKING</td>
<td><strong>SF</strong> SENSING + FEELING</td>
<td><strong>NF</strong> INTUITION + FEELING</td>
<td><strong>NT</strong> INTUITION + THINKING</td>
</tr>
<tr>
<td>Focus on:</td>
<td>Facts</td>
<td>Facts</td>
<td>Possibilities</td>
</tr>
<tr>
<td>Handle these with:</td>
<td>Impersonal analysis</td>
<td>Personal warmth</td>
<td>Personal warmth</td>
</tr>
<tr>
<td>Thus tend to become:</td>
<td>Practical and matter-of-fact</td>
<td>Sympathetic and friendly</td>
<td>Enthusiastic and insightful</td>
</tr>
<tr>
<td>Find scope for their abilities in:</td>
<td>Technical skills with facts and objects</td>
<td>Practical help and services for people</td>
<td>Understanding &amp; communicating with people</td>
</tr>
</tbody>
</table>

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When I had spoken to Barb on the phone about participating in the study, she had said, “I’ll be happy to do it. I may need someone’s help in the future. I’ve been thinking about the doctoral program myself. I’m curious about what it takes.” Barb has an undergraduate degree in Mathematics. She is currently enrolled in a Master of Mathematics Education program. I had told Barb that it was important to me to have her in the study because of my difficulty in finding an NF with strong preference scores. She wanted to make sure I understood the possible constraint of her dropping out of the study if the adoption of her second child went through.

Barb’s willingness to participate in the study was supported as characteristic of ENFJs by Hirsh and Kummerow’s (1989) description of them as “lively and enthusiastic facilitators who apply warmth and vision to helping people and meeting their needs” (p. 208).

**Demonstrate Energy and Devotion**

During our conversations, I was struck by the seemingly boundless energy Barb projected. After observing her in the classroom in the following months, I was again struck by her constant movement. She tended to many activities at the same time yet was conscious of everyone in the room. Kounin (1970) called it “withitness” and “overlap.” Kroeger and Thuesen (1992) wrote that “when an ENFJ scans a situation, he or she is often aware of the many interpersonal dynamics taking place” (p. 379). They added that it was energy coming “from the outward directed, socially oriented, gregarious external world”
Barb herself commented, "I usually hit the ground running, but you should see me the last period. I'm exhausted." This is characteristic of Myers' (1993) description of the ENFJ demonstrating "energy and devotion" (p. 23), and Thorne and Gough's (1991) data on ENJF females. They reported ENFJs describing themselves as "clear-thinking, active, energetic, enthusiastic, capable, civilized, self-confident, alert and sincere" (p. 94).

**Demonstrate Warmth, Compassion and Support**

Barb's attention and care for individual students was demonstrated regularly. Her prep time was first period, so she was alone in her room early with the door unlocked. When the bell rang for the period to end, she stood by the open door greeting students by name and calling out greetings to other students walking by her mobile classroom. About greeting her students, Barb commented:

> The kids need to know I'm not distant. I think getting to know the kids one-on-one, calling them by their names ... I do that from the first day. That's the way I force myself to learn their names. Then, after that, I don't know if it's more than habit, or I just like seeing the kids in the morning and saying 'Hi' to them.

She also said that she greeted students at the door to get some privacy outside if there was some issue she had to discuss privately with them. Kroeger and Thuesen's (1988) description of an ENFJ might have been written for Barb.

> Their focus is directed toward other people (Extroversion), and they are highly skilled in understanding others' needs and motivations (Feeling) ... The ENFJ has the capacity to size up a situation Intuitively and, in a very caring way, say just the right thing. This is part of why people are drawn to ENFJs and why ENFJs are such natural leaders (pp. 272-73).
Assume Responsibility for Harmony in Interactions

An experience I had in Barb’s home reinforced the accuracy of Barb’s MBTI. She had invited me to her home to view the video for the stimulated recall interview. Bettina, her young daughter, was present. Several times Bettina interrupted her mother with a series of requests and questions. Barb, not missing a beat in the interview, responded to the questions and requests, reminded Bettina of who I was, and chatted with her briefly. She hugged and kissed Bettina several times, all the while keeping her eyes on the video. Only once did she ask me to stop the tape while she prepared a snack for Bettina. Toward the end of the interview, Barb’s husband came home from work. He was immediately introduced and engaged in the interview. Barb balanced a number of simultaneous activities well and gracefully. She tended to her daughter, controlled a very large and energetic dog who wanted to sit in my lap, and welcomed her husband, all the while continuing the interview while watching the video. She demonstrated Myers’ (1993) description of the NF as characteristically assuming “responsibility for harmony in interactions” (p. 23). All of these activities took about 90 minutes and the interview was completed successfully.

Career Choice Data

Barb’s current and previous career choices reflect the Center for Applications of Psychological Type (CAPT) data bank figures for ENFJs that include a significant representation of NFs in teaching (Myers & McCaulley,
Table 9 reflects ENFJ and NF career choice frequencies for Barb's current and previous careers.

Figures indicate that of the almost 17,000 teachers who completed the MBTI, 30.96% were Intuitor Feelers. Intuitor Feelers were 8.78% of the 649 high school math teachers. Many more NFs were found teaching at the junior college level (34.40%) than at the high school level.

<table>
<thead>
<tr>
<th>Career Choice</th>
<th>ENFJ % of Total N</th>
<th>NF % of Total N</th>
</tr>
</thead>
<tbody>
<tr>
<td>teachers</td>
<td>7.69%</td>
<td>30.96%</td>
</tr>
<tr>
<td>high school math teacher</td>
<td>5.63%</td>
<td>8.78%</td>
</tr>
<tr>
<td>junior college teaching</td>
<td>7.84%</td>
<td>34.40%</td>
</tr>
<tr>
<td>brokers</td>
<td>5.15%</td>
<td>14.71%</td>
</tr>
<tr>
<td>accountants</td>
<td>4.22%</td>
<td>17.80%</td>
</tr>
<tr>
<td>computer professionals</td>
<td>3.37%</td>
<td>28.62%</td>
</tr>
</tbody>
</table>

Teaching N=16,678
brokers N=136
accountants N=427
computer professionals N=297

Myers and McCaulley (1985) wrote that the higher the grade level, the more Intuitors will be found, perhaps because of their scholarly bent. Extroverted
Sensors are found in high numbers in primary and elementary grades, demonstrating their "nurturant and helpful type" (p. 133). There is an inverse scale in type and grade level ranging from the ESFJs in the early years to the INTJs at the community college and university level. McCaulley (1976) wrote that:

... the higher one goes in the academic ladder, the greater the proportion of Intuitive types in a sample. Higher education with its demand for complex problem-solving, and for working at an abstract, theoretical, or imaginative level, suits the interests of Intuitive types (p. 7).

Barb was in her ninth year of teaching. Her ease of teaching at higher levels began at a community college in an eastern state. She had later taught as an adjunct at a state university. Barb's supervisor at Brier, Dr. B. also commented on her skills in teaching at the community college level:

As a matter of fact, she is such a good teacher that I asked her many times to substitute in my community college [math] class. And I'm very particular about who substitutes when I'm not there at the community college, not because I'm a great teacher, but I want to make sure those adults ... you know they don't accept as quickly as [younger] students ... you have to have a good teacher in there, someone who's energetic but positive, a great personality.

When asked if she had had another career prior to teaching, she replied, laughing:

Oh, my yes. I was a police dispatcher for 12 years, then a Triple A [baseball] statistician for two seasons... I always wanted to be a sports' statistician and I got to do it... then a stock broker for one year. I did some accounting. I was a change person [in casinos] and I also did computer entry.
She said she had "always wanted to be a baseball statistician," and she "got to do it; loved it" and then moved on. Talking about her career change, Barb repeated the story of being "discovered" in the college math class. She added, "I liked it and I decided to teach." She also noted that the idea of teaching was appealing because she was "burned out" in her other careers. Myers and McCaulley (1985) wrote that: "ENFJs are found in jobs such as teaching, preaching, counseling and selling. They may be less happy in work demanding factual accuracy, such as accounting, unless they can find a personal meaning to their work (p. 24)."

Kroeger and Thuesen (1992) wrote:

One of the strengths of ENFJs is their capacity to inspire others. ENFJs have been called life's teachers. To the degree that teaching, leading, and working with others to accomplish something involves understanding others' needs, finding the exact words to inspire, and the appropriate affirmations along the way, ENFJs are naturals (p. 382).

Myers and McCaulley (1985) wrote that "consistent with the expectation of type theory, the type classifications relate to three aspects of educational achievement: aptitude, application, and interest" (p. 95). Because NF teachers are at a low frequency in elementary and middle school environments and at a high frequency at the university level, it may well be that Barb's learning style was not matched by a teaching style that encouraged her "application and interest" until she entered the university, thus developing her interest and proficiency in math.
Barb described what her expectations had been when she became a teacher:

I expected that I wouldn't make a lot of money and I was right [laughs]. No, I really don't. I knew I didn't want to go into administration. I knew I want to stay in the classroom. That hasn't changed a bit.

The only negative Barb ever mentioned about teaching was the administrative paperwork involved. She said, "That's my work [paperwork]. This [teaching] is my job. If it weren't for the work, I'd love this job [laughing]."

**Learning Style**

In describing learning styles, Myers and McCaulley (1985) wrote that "the judging attitude (planful, focused, and organized) is related to application and is often associated with higher grades [academically]" (p. 96). On a number of occasions, Barb demonstrated her "planful, focused and organized manner."

**Preference for Structure and Planning**

Barb gave out an "expectation sheet" at the beginning of the semester and then reinforced "it about once a week for the first month so that we know how to label things, what's expected of them". She had a system for awarding extra points that included "surprise" extra points. Also, the class that behaved the best while a substitute taught was awarded donuts or "Free Homework Passes." Barb's system for assigning and collecting homework was highly structured. Baskets were placed in the back of the room where students turned in assignments. Student aides credited assignments received, and papers were
returned for student pickup. Barb kept close watch on the makeup work of absentee students and on accurate documentation of extra-credit work.

**Learn through Personal Relationships**

In his discussion of "Learning Preferences Associated With MBTI Types By Mental Process Combinations" (p. 42), Lawrence (1993) noted that NF types: “learn through personal relationships; dislike impersonal, didactic instruction; highly value faculty feedback; low-friction student-led discussions; opportunities to be creative and original” (p. 41). Kroeger and Thuesen (1988) pointed out that “learning, for ENFJs, is also imitation. They seek to learn by emulating their heroes, and how they learn” (p. 275). Barb gave a great deal of credit to her master teacher for her own success. She related that her master teacher taught her to “control a class with just looking,” and to “vary her teaching strategies.”

She shared that she:

...had an incredible master teacher and somebody came in one day to observe me and said, “You know, you teach a lot like Mrs. ____.” I said, ‘Well, hey.’ And you know one of my students who had Mrs. ____ last year said, ‘You know, I feel like I never got out of class.’ [laughs] And I took that as a compliment because I thought she was a wonderful teacher.

**Dislike Impersonal, Didactic Instruction**

Barb had a regular daily plan of correcting homework with the class using question and answer techniques. She then moved on to presenting new material or reviewing for a test. This was done in a highly interactive mode involving the students by asking them to help with explanations of the homework answers.

During my observations of Barb, the most time she spent lecturing or
demonstrating new concepts without involving students was five minutes. New concepts were usually presented in a participatory manner with Barb querying students on what they already knew about the new material, always making connections to prior work.

Highly Value Faculty Feedback

Barb noted the need for feedback from her peers was not being met. She said the only time she really saw them was at “monthly department meetings. In portables I'm estranged from other teachers. I'll be leaving them [portables] next year to go to the main building.” Barb related that, “Being out here in the portables currently makes this [collaboration] difficult. We're not really connected on a regular basis with the teachers in the main building.” As noted previously, one reason Barb went into teaching was because of a professor’s mentoring of her.

Learn Through Low-Friction Student-Led Discussions

Barb's enjoyment of one-on-one discussions with students was demonstrated a number of times. When asked if she noted any difference between the boys and girls in the class, she replied that she noted the “girls are more aggressive with their questions.” I speculated that it might be because she presented a very positive image of a woman and they were comfortable in the class. She replied:

Very positive. I've got to tell you a story. Yesterday we were doing group work. And I came back and helped these four kids. One of them knew what they were doing in their team and was trying to explain it to the other
three. And this one girl, who's had a lot of absence problems and some other tardy problems and other things... she looks up at me and she says, "Were you a nerdy math person in high school?" I said, "No. [laughs] I didn't like math at all in high school. I was not good at math. I was a nerd for other reasons. She goes, 'Well when did you start liking it?' I didn't start liking it until I was in college. 'You mean there's hope for me?' Oh, yeah. There's plenty of hope for you. I didn't think I'd ever be able to do math.

Kroeger and Thuesen (1992) wrote that often ENFJs “will be perceived as popular role models, something they enjoy and espouse” (p. 380).

Value Opportunities to Be Creative and Original

Barb also noted that she enjoyed teaching with multimedia resources such as games, paper airplanes, and kinesthetic activities. She did not feel restricted by the administration in trying any new strategy she felt would work. A number of times her supervisor, Dr. B, noted that he supported and admired the variety of innovative methods that Barb used in her teaching.

In further describing how preferences affect learning, Lawrence (1993) wrote that the intuition style[N] prefers:

... being caught up in inspiration; moving quickly in seeing association and meanings; reading between the lines; relying on insight more than careful observation; relying on verbal fluency more than on memory of facts; focusing on general concepts more than details and practical matters" (p. 44).

Barb shared that, "At the beginning of the year I fill out goals." She also noted that she preferred, “group work with hypothetical situations rather than concrete ones. These students have had little prior experience with projection [problem solving]. They have been led prior to this." At one point in viewing the video of
her teaching, Barb commented on an in-class assignment she had given students to write an explanation of how they got their answers.

Now this is something I like to do. I don't do it very often, maybe just once a month. In my warm-up, I'll say, 'Write how you do it. Don't do it.' But I want to make sure they can tell me how to do it. If they can tell me how to do it, they can solve any of them.

Data from Interviews and observations of Barb yielded numerous examples of Lawrence's (1993) descriptions of the NF learning styles preferences. The hypothetical, in terms of problem solving, was important to her so she incorporated it into her teaching. Innovation, also important, was demonstrated with her real-world activities. One was a car-shopping activity where students had to calculate all aspects of buying a car including shopping for the best price and figuring out the cost of financing. Her preference for personal interaction in learning was demonstrated by her frequent use of one-on-one coaching and small-group work that she monitored carefully.

Teaching Style

Findings on Barb's teaching style begin with a description of her teaching environment and students and with the data collection procedures. These descriptions are followed by a delineation of the instructional strategies and media observed during the Nine Instructional Events (Gagné & Briggs, 1976). Data on the participant's teaching style include interviews with her and her supervisor, classroom observations and post-observation interviews. Triangulation data includes information from a colleague who viewed the
videotape of the participant teaching and comments from the participant offered after her reading of the case study findings.

**Environment and Students**

I observed Barb for five class periods, having identified her as a participant too late in the semester for more observations. The class was the second-period intermediate Algebra class. There were 26 students in the class mostly sophomores and juniors, with one senior. The class was almost evenly divided in number between boys and girls. Caucasians were the predominant group, with six Hispanics and four Asian-Americans. In terms of ability level, Barb said that:

>This class is ... probably about the middle of the road ... in both periods it seems like they lumped them all together. The kids who really struggle -- and I have a lot of kids who don't do well in that class, not because I teach it any different and I love those kids -- they're my favorite kids as far as that goes. And my fifth period kids are real quick kids. And I have a lot of As in that class.

**Data Collection Instruments**

I observed Barb using a checklist that was all-inclusive of strategies and media that might be found in any middle or secondary school classroom, and in Gagné and Briggs' (1976) Nine Instructional Events (see Table 10 and Appendix B). I revised the checklist after my first observation of Barb. After three of the observations, I conducted post-observation interviews with Barb.
Table 10

Checklist Summary of Case Two Instructional Strategies and Media

<table>
<thead>
<tr>
<th>Instructional Event</th>
<th>1 gain attention</th>
<th>2 state objective</th>
<th>3 prereq</th>
<th>4 pre-stimulus</th>
<th>5 provide guidance</th>
<th>6 elicit performance</th>
<th>7 feed-back</th>
<th>8 assess</th>
<th>9 enhance retention and transfer</th>
<th>Total % of total used*</th>
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<tr>
<td>advance organizer</td>
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<td></td>
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<td></td>
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<td>3</td>
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<tr>
<td>Ques. &amp; Ans.</td>
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<td>12</td>
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<td></td>
<td>13.0</td>
</tr>
</tbody>
</table>

*N=209 Total number of instructional strategy and media use incidences tallied

**Instructional Events**

Barb had very specific plans for each day’s lessons. She described her usual plans as including (1) a review of the homework, (2) a coaching session that included going over four problems selected by the students as having been troublesome, (3) review of work done previously, (4) presentation of new or...
ongoing work, (5) time allowed for homework. When asked if she modified her plans by adding new teaching strategies for her classroom, Barb said:

   Every year. At the beginning of the year I fill out goals. Last year it was the graphic calculator. I model organization for kids. I incorporated it as a teaching strategy. I showed them and walked them through their responsibilities, not just told them. I wouldn't answer questions on basics. They were responsible for getting those answers. The kids were organized the next semester.

Dr. B. talked about the strategies and media he had observed Barb using. He cited a number, saying:

   She does some nice things. She did a project ... where she wrote different individuals, the President, the city council members, the mayor and about how [they] use math in their daily life. A lot of those individuals wrote her back explaining. She just used that and posted it in her classroom and spoke to her kids about how you need math everywhere you go. Look at the President who uses it ... to the president of the [large local] corporation.

   **Gaining Attention**

   During the periods that I observed Barb, she used a variety of strategies for the first instructional event, Gaining Attention. They included four announcements, two directions, three question-and-answer segments, and two instances of humor. An example of Barb's strategies for gaining attention was her question about the homework. "I'm going to do a reality check. How many of you did not do your homework? OK, guys. This is the beginning of a new nine weeks. You really, really, really have to do your homework."
Stating Objectives

In the Stating Objectives segments, Barb used announcements six times, directions three times and overhead with lecture once. Because correcting homework first was a regular activity, Barb seldom announced it directly. When class began and she turned on the overhead, students immediately knew to take out their homework. By the time she asked the first question, students were usually ready. After the homework correction, the major work for the day was begun with an announcement indicating whether it was totally new work or a continuation of what they had been doing.

Prerequisites

For the Prerequisites segments, Barb used two announcements, one large-group activity, and one overhead lecture segment. One day during a large-group prerequisite activity, a review of prior work, Barb commented on the lack of participation. She said, “Some of you didn’t even attempt it. That disappointed me by the way.” Barb regularly reinforced effort as well as results.

Prestimulus

The Prestimulus segments, which included a preview of new or ongoing work for the day, found Barb using an increasing number of strategies. During this segment, she used an advance organizer once, directions twice, question-and-answer segments four times, and large- and small-group segments three times each. She gave lecture-demonstration six times. The media she used during this instructional segment included the chalkboard three times and the
overhead projector five times. An example of Barb's Prestimulus work was her introduction of a new lesson on absolute value inequalities. She said, "We're putting together what we've learned the last two days. We'll start with a warm-up." She then presented two problems on an overhead. When the students had worked the problems with her, Barb said, "OK. Good job. I'm happy." Barb's warm-hearted humor came through while she was announcing another new concept. She said, "Watch closely, boys and girls, because I'm going to give you the best I've given you today ... maybe this week. I'm going to show a threesided equation."

Providing Guidance

The Providing Guidance segments included four directions, three teacher-led discussions, 15 instances of one-on-one coaching, and three question-and-answer segments. During this segment, Barb also facilitated one small-group activity, used humor once, lectured twice, provided 11 lecture-demonstrations from existing overheads, and used the overhead projector four times to calculate examples of new content with student input. In describing her flexible lesson presentations, Barb said:

I feel like a standup comic some times. I can improvise if I need to. And I listen to what the kids are saying. If I see or hear that they aren't understanding it, then I drop everything and I rework it. We find another way to do it. But for the most part, it's pretty smooth. There are some times when I do a lesson the night before, and then I realize as I'm going through and looking at this while they're doing their homework, that I've got to do something. I should have shown this one concept that I didn't, so then we'll have to drop ten and punt.
Eliciting Performance

During the Eliciting Performance segments, Barb probed for student comprehension using a one-on-one focus five times, large-group focus four times, question-and-answer segments 12 times, and giving feedback six times. This segment also included five instances of paper/pencil work and seven instances of overhead use to elicit performance. During an interview Barb talked about how she presented/practiced material in her classes:

It depends on the level. For low-level students it would be hands-on work ... work outside the class like measurements, estimation, paper airplane flying. For the intermediate students I would vary among lectures and group work. With the higher students, it would be lectures to prepare them for college, outside-of-class projects, group work with hypothetical situations rather than concrete ones. These students have had little prior experience with projection. They have been led prior to this.

Barb talked about teaching strategies that were most comfortable for her and how frequently she used them:

Lecture, group with anything, depending on strategies. No one is allowed to miss work. I send home notices to parents that students will make up work at the after-school session. Students are invited to the next camp session after school to do makeup work.

Feedback

For the Feedback segments, usually associated with homework or during in-class Performance segments, Barb used one-on-one strategy once for a number of students, question-and-answer strategies twice, and humor twice. She also employed lecture/demonstrations five times, during which she used the chalkboard seven times and the overhead projector five times. Hirsh and
Kummerow (1989) wrote that ENFJs are "at their best facilitating situations that require interpersonal sensitivity. ENFJs are tolerant and appreciative of others ... are able communicators who are liberal in showing their appreciation for others" (p. 208). Of note in Barb's feedback was her frequent use of affirmations. Some of them included: "I love it when you talk math!" "You OK? Got it?" "No, you're close. You're close though." "Who can help her out?" "You got it!" "OK, good job." "I'm happy!" "Thank you for noticing [another way to do a problem]." "Oh, you don't need that [calculator], but you can use it if you want to." "Take your time. I've got four people with their hands up – five – six, great!" "I'm seeing some good stuff here."

**Assessment**

Assessment was ongoing in Barb's class. Homework, in-class work, extra credit activities and unit testing were criteria for grades. Ample opportunities were offered for makeup work for students who had been absent and, periodically, for the entire class if their grades had been slipping. At one point Barb had given students an opportunity to take home a makeup exam. The next day, she announced she would collect them. "How many of you have a makeup exam for me? Only three? Doesn't show me much on the responsibility level. This was your last chance to clean up a failing grade."

Individual effort was also criterion for grades. When Barb assigned small-group activities, she walked around the room with her grade book, noting the effort of individual small-group members. She encouraged observers to become
participants in the activity of solving a group problem and graded according to participation as much as correct answers. An example of this small-group activity was a review activity she facilitated the day prior to a quiz. She assigned a group review giving five points each for five questions and five points for each student for group cooperation. She said it was "a subjective five points, but I do it to get students who always work alone to work with a group." Her directions to the group were, "How about if each one works at the problems first and then compares them with the rest of the group. I'll be coming around to see how you're working within your group." She observed each group at least three times during the activity.

Enhancing Retention and Transfer

At the end of each class, Barb gave students an opportunity to work on the homework for the next day. She felt the in-class activity was important for "finding anything I need to point out to them that might help them for that night." The next morning's class was begun with a group correction of the homework and student peer coaching on problems anyone had with the homework.

Triangulation

Two methods besides observations and interviews were used to triangulate the data – peer viewing of a videotape of Barb's teaching and member checking, Barb's reading of the manuscript for concurrence with the portrayal of her teaching. The peer review of the videotape and my review tallied closely in identification of instructional strategies and media when our different
methods for tallying were identified. Her method was tallying segments of activities and mine was tallying individual instances of instructional strategy and media use. During Barb's review of the manuscript, she noted that she felt I had captured her teaching accurately but that she thought she was using sports analogies more than I had documented. She said she might have used them later in the day with other classes, not when I had observed her.

**Summary of Teaching Strategies and Media**

Figure 6 displays the summary. The major strategy that Barb used was question-and-answer segments (35 times). She conducted these sessions during seven of the Nine Instructional Events. She did not use question-and-answer segments during the Stating Objectives and Prerequisites segments. One-on-one work with students was the next most frequently-used strategy. Announcements, followed by directions, were used during the first four instructional events. Barb lectured with overheads 15 times, 10 times during the Providing Guidance segment, and five times during the Eliciting Performance segment. She used announcements 12 times and gave directions 10 times. Barb provided formal feedback nine times during the Eliciting Performance and Assess segments of classes. She also provided feedback informally 26 times, using the following strategies: one-on-one (five times); question-and-answer (two times); humor (two times); lecture-demonstration (five times); chalkboard (seven times); overhead (five times).
Figure 6. Case Two Summary

Other Factors Influencing Teaching

All of the potential influences on Barb's teaching existed in varying degrees. These included education, school administration, resources accessibility, prior experience, and beliefs.
Education

As noted earlier, Barb felt that her master teacher had made a significant impact on her teaching. During the initial interview, Barb had described undergraduate and graduate majors. "Math was my undergraduate major. Secondary Ed is my masters. I went back for the PDD program." The PDD (Professional Development Degree) had been designed by the university she attended to identify math and science graduates with high GPAs and get them into the classroom in an efficient manner. The goal was to relieve the shortage of math and science teachers in the district schools. Barb further explained that her program had included "student teaching without a practicum, about 22 credits. Math methods – secondary and intermediate."

When asked what types of inservice activities had been provided for her when she began teaching, she replied, "two days of inservice prior to coming into the district." Dr. B had mentioned that regular inservices were held for teachers during the year. Barb added that she shared information and ideas about teaching strategies with other teachers on the staff at monthly department meetings. During the first observation, I had noted that Barb asked students to call out homework problems that had caused them trouble. I asked if this was a strategy that she had learned in a teacher education course. She replied:

No, if I had a question on something, I was one of those who would not hold back. I mean I'd just say, 'I don't understand this,' but I know a lot of kids won't, so if you do it as a group, 'OK, who needs something?', then as soon as one does it, then the others are going to follow.'
Barb enjoyed support from school administration. Her supervisor, Dr. B., spoke of her teaching in the most positive terms. When asked how often he had an opportunity to observe Barb, he answered:

Over the two years a minimum of ten times, a maximum of twenty times, and that's because last year I can't remember how many times I observed her classroom and this year ... we try to get in there at least five times a year.

I noted that the number of his visits demonstrated a higher level of supervisor participation than what I had observed in other classrooms, Dr. B said he visited her classroom frequently to relax and to remind himself what "good teaching looks like." He added:

And the scary part is with a top flight teacher – and I really believe Barb is a top flight teacher – you don’t have to go in as much and you really go in to get away from the bump and grind of the daily paper work. That’s what I do and remind myself of what we’re here for and just go into those types of classes where the teachers are doing an excellent job. So in her class, I go in there as much as possible because she is doing an outstanding job.

Dr. B. spoke more of Barb’s teaching and her willingness to grow and to try new strategies, one being a “calculator-based lab where they use a calculator in different lab situations to teach mathematics. It uses the graphics calculator but it uses something different – it teaches motion and temperature and it does calculations automatically for you.”
Resource Accessibility

Asked if there were any teaching strategies that were being emphasized in the school, Dr. B. replied:

We try to emphasize, hands-on, the use of computers, and interaction with the students. Textbook and board work is nice and it's needed in all math classes, but we want to make sure our teachers extend beyond that.

When asked what she would buy if she had unlimited funds, Barb had replied:

Computers for the classroom, white boards, better lighting. I'd have Internet for Research, the World Wide Web. I would like to communicate with another classroom [on Internet]. Teachers who have computers use what they can. We are looking into teaching as a team. Being out here in the portables currently makes this difficult.

Barb noted there was no money for the computers she wanted in her classroom. She said she was “very, very open to using them.” She also said she wanted to have “all her ducks in a row and have the technology integrated into her lessons” before she did use computers.

Prior experience

As noted before, Barb's prior work experience was something she used regularly. "I have used my prior experience for my classes; stats from the ball club, doing a section on the stock market, things not in textbooks." Dr. B. noted her use of prior experience also.

I've seen her do so many different things. She does class projects where she gives the students assignments at home and they would use their knowledge with, for example, purchasing cars. And she made them go out and do projects on how to purchase a car — real-life experiences and how their knowledge with math influences their decision making. Her greatest strengths are interacting with the students and her positive upbeat nature. And that, of course, comes with confidence and her background in a
different career and her maturity in math. And she does different hands-on material in class.

During my observations of Barb, I saw only one direct reference to her previous career. As she was assigning a problem in the textbook, she noted that the names in the problem were twin brothers Roy and Ray. She said, “Did you know that Mickey Mantle had twin brothers named Roy and Ray?” On several occasions, however, she used the term “warm-up” to introduce a new concept and several times gave feedback by saying, “You’re in the ballpark.” She also used the phrase “drop ten and punt” at least three times.

Beliefs

Barb had clear and strong beliefs about learners that manifested themselves in her use of any strategy or technique that would help them:

I don't think that I have ever met a kid that can't grasp some of the concepts, if it's presented the right way. I think that there are kids that I haven't connected with, and some kids that because I haven't connected with may not have grasped as much as I had hoped - whether that be for personality reasons or for teaching style or whatever it is. But I also think that if a kid really tries in math, there's no reason they can't do it.

On another occasion we were talking about beliefs about student effort. She had noted that she would try anything and everything to help students, but sometimes nothing worked. She then related an example:

There's one girl in one of my classes [who's] gotten a tutor. It still hasn't helped ... she comes in for after-school help but she's not really putting it forward. She isn't. I mean she doesn't do the work. She doesn't complete the work. I've sent her for extra help over to the National Honor Society in the school [which] provides extra help. She goes through the motions. Because of the fact that she's not putting into it, she's not getting anything out of it.
Another belief that greatly influenced Barb was that of the importance of establishing a caring environment in the classroom. This is indicative of the Feeler part of her personality. Myers and Myers (1980) described ENFJs as valuing, "above all, harmonious human contacts" (p. 93). They noted that ENFJs are "best at jobs dealing with people and situations where cooperation can be won by good will" (p. 83). One example of Barb's caring was a vignette she shared with me.

I have one kid who was struggling with math [his prior grades had so indicated]. He came here and that first week, I don't know what it was but I noticed this kid was really good at math, at algebra. So I called his dad and I said, 'you know I'm really happy with what he's doing. I think he will be a good addition to the class.' And all of a sudden, just, Boom! [snaps finger] We took a test at school to qualify for the Math Council. It's a district-wide thing. They had to qualify three kids from the school. And kids from Algebra 1 and Algebra Honors could take the Algebra 1 [test]. He finished second and he wasn't in an honors' class. It's good to see some of these kids do it. It's exciting.

**Case Summary**

For the Nine Instructional Events, Barb used 16 strategies and media. Her predominant strategies were question and answer sessions, one-on-one work with students, and lecture-demonstrations with overheads. Barb used announcements 12 times and directions 10 times. Barb's predominant medium was the overhead projector with the chalkboard being the next most frequently used medium. Factors, in addition to personal learning style, that influenced Barb's teaching included administrative support for autonomy in the classroom,
her prior career experiences, her teacher education, and her belief that any
student could learn math.

**Discussion**

Myers and McCaulley's (1985) research on type differences in learning
styles identified a number of characteristics for the Extroverted iNtuitor Feeler
Judger. The majority of these characteristics described Barb's learning/teaching
style.

**Role of the teacher.** “The role of the teacher is to encourage, inspire,
provide variety and creativity and motivate students to develop” (Myers and
McCaulley, 1985, p. 135). Barb's stated goal was to help students become
independent thinkers and problem solvers. To do this, she regularly planned
lessons to appeal to a variety of learning styles and to motivate her students.
Examples included her use of real-world applications, small-group work, written
descriptions of math processes, ongoing affirmations of effort, and positive
feedback on product.

**Curriculum planning.** “Ideas for teaching come from concepts from
content of subject taught; courses, reading, knowledge of student development,
and ‘ideas from everywhere” (Myers and McCaulley, 1985, p. 135). Barb used
the textbook as the basis for her planning. She had a responsibility to cover all
of the material in the syllabus but was uncomfortable with that requirement,
especially if students needed extra work on a concept. She added real-world
application activities as much as possible. Her focus was on making the students life-long knowledgeable math users.

**Lesson planning.** "Teaching is planned by structuring plans around general goals, themes, and students' needs; then adapting plans to students' needs week to week" (Myers and McCaulley, 1985, p. 135). Though structuring daily plans was part of Barb's preparation, she also responded to student needs in the course of a lesson by adapting her plans. She regularly queried students for comprehension, both orally and in writing, and changed her plan when students needed extra help.

**Teaching.** "Typical method of teaching is described as using a flexible pattern depending on topic and student need" (Myers and McCaulley, 1985, p. 135). Barb was very clear and very specific on her selection of strategies and media. She was also quite articulate in sharing her vision of students as problem solvers and independent thinkers. She was open to learning new strategies on a continuing basis and using them in the classroom.

**Assessment.** "Students' work is evaluated by using a number of factors, only one of which is grades" (Myers and McCaulley, 1985, p. 136). Barb gave the tests required by the department, but also offered ample opportunities for extra credit. Each day's work included individual and small-group activities that could be done for extra credit. Barb described her testing procedures:

I very seldom give multiple choice questions until it gets closer to the time for the final exam, because the final exam is multiple choice. So then, the last two tests of the nine weeks, just before the final, I give them as
multiple choice. And when we go over them, we talk about eliminating that one you know it can't be. And they have to be able to read the directions and understand the directions.

**Criteria for success.** "The teacher feels successful if student learning and participation increased and there is the feeling of having made a personal contribution to students' education" (Myers and McCaulley, 1985, p. 136).

Giving the students a good foundation for future success was important to Barb. "If they can get a foundation now, they're going to go on in math. They're not going to stop ... when you see the lights go on with something with these kids, it's really nice." Talking about why she had gone into teaching, Barb spoke of the satisfaction of seeing students accomplish something:

...And there's nothing better than standing up in the front of the room and seeing a kid go, 'Oh, yeah! Yeah! I see that now!' Or having a kid come back a couple of years later and saying, 'I'm taking physics in college.'

Barb also spoke of the great feeling when students came back in later years to tell her how math had become important to them:

Someone comes back and says, 'You know I never thought I'd have to use this stuff, but I'm working as a surveyor and I've got to know about Pythagorean theorem, or I've got to know about something else.' Or when they come back even just to say 'Hi,' it's just so neat that you made some sort of difference.

At one point during a post-observation interview, Barb reflected on a student who had come up with the answer to a difficult problem. She jumped up and said, "I love teaching algebra! I love teaching algebra!" Asked if it was her favorite subject to teach, she answered:
Yeah. I ... these kids ... if they can get a foundation now, they're going to go in math. They're not going to stop. If they can't [pauses] when you see the lights go on with something with these kids, it's really nice. It's not like the honors kids where you know the lights are going to go on 90 percent of the time.

**Conclusion**

The data appear to support a strong relationship between Barb's learning style and teaching style (see Table 11). From her dislike for didactic teaching, exemplified by a heavy use of small-group and individual work, to her belief in positive feedback and harmony in the classroom, Barb appeared to teach to her preferred mode. Her personal attention to students, demonstrated by extensive one-on-one work in the classroom, and attention to students' personal issues that could present barriers to their learning, demonstrated characteristics of the NF teacher. Her openness to innovation and use of a variety of teaching strategies were also congruent with the descriptions of NFs in the literature.

In speaking of the 16 Jungian personality types each having distinctive patterns of priorities and values associated with them, Lawrence (1993) wrote that NF priorities include:

... finding situations where they can pursue their deep concern for broad, human value issues; finding situations that allow them freedom for creative expression; exploring the possibilities in relationships; finding situations that value their insights into complex interpersonal problems; making institutions responsive to people; promoting the ideals of harmonious relationships.

Barb's priorities, her family and her students, received the benefits of her NF characteristics. From her adoption of abandoned children (her second child was
adopted recently), to her work with students struggling with math, Barb demonstrated her personality type and learning and teaching styles as described in the literature.
Table 11

Examples of Learning/Teaching Styles Data from Case Two

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<thead>
<tr>
<th>Barb's (ENFJ) Learning Style Preferences (from Lawrence, 1993)</th>
<th>Example</th>
<th>Barb's (ENFJ) Teaching Style Preferences (from Lawrence, 1993)</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Having a strong, interesting, external-extroverted reason for studying beyond learning for its own sake.</td>
<td>Had numerous careers before teaching, some of them planned, but wanted to be able to add worth to lives of children so changed to teaching.</td>
<td>Role of the teacher is to encourage, inspire, provide variety and creativity, and motivate students to develop</td>
<td>Works diligently to motivate students; spends a great deal of extra time and effort helping students who are having academic and personal problems.</td>
</tr>
<tr>
<td>Value opportunities to be creative and original</td>
<td>Has been a risk taker and innovator in her careers, particularly that of baseball statistician which is a non-traditional career for a woman.</td>
<td>Teaching is planned by structuring plans around general goals, themes, and students' needs; the adapting plans to student's needs.</td>
<td>Used innovation real-world activities such as writing to successful people and asking how they used math in their lives.</td>
</tr>
<tr>
<td>Learn through personal relationships; dislike impersonal, didactic instruction.</td>
<td>Barb gave a great deal of credit to her master teacher for helping her learn to teach; considered it a compliment to be compared to her.</td>
<td>Typical method of teaching is described as using a flexible daily pattern depending on topic and student need.</td>
<td>Had daily prep time for classes well planned but adjusted for student needs often based on homework assignment results.</td>
</tr>
<tr>
<td>Appreciates feedback that shows warm appreciation for student and his or her effort, and gives corrective suggestions in that context.</td>
<td>Credited her supervisor with giving her the feedback she needed, in the manner she need it, to become a successful teacher.</td>
<td>Students' work is evaluated by using a number of factors, only one of which is grades.</td>
<td>Use a systems of evaluation that included grades, attendance, effort, team work and numerous opportunities for extra credit.</td>
</tr>
<tr>
<td>Highly value faculty feedback.</td>
<td>Was surprised but gratified when she read her supervisor's and the researcher's comments about her teaching during the member - checking activity.</td>
<td>The teacher feels successful if student learning and participation increase and there is the feeling of having made a personal contribution to students' education.</td>
<td>Repeatedly noted pleasure at seeing visiting former students who shared how they used math in their lives; missed having peer interaction because of remote location of portable classroom.</td>
</tr>
</tbody>
</table>
CHAPTER 6

Carl, the Candy Man

Carl is a high school math teacher at Canyon South, an alternative high school in the southeast quadrant of the city. Canyon South and its personnel are described in detail because of the school's unique character, its difference from the other three sites in this study. As Burgess, Pole, Evans & Priestly (1994) wrote in their explanation of site selection for their multiple case study: “The size of the school was considered to be important as far as teacher-pupil relations were concerned, and the extent to which teachers and pupils could get to know each other” (p. 133). The site had an impact on how Carl taught and on his future plans. Following the site description, this chapter then describes findings on Carl’s personality type, career choices, learning style and teaching style. It concludes with discussion of the impact of his learning style and other factors on his teaching style.

Site

It was the people, not the school building nor premises, that made the students want to stay. At Canyon South, an alternative high school, students
didn’t want to return to their host schools, as a faculty member related one afternoon in the break room:

For many, it’s the first time they’ve had special attention. We are a small school and we all [staff and faculty] know each student’s name. We know when someone is absent and we personally call home. We have a common prep time so we can plan what the best help is for students who are in all of our classes. They are supposed to go back to their schools but some don’t want to so we have had to organize graduation activities, which is not our mission.

Canyon was one of six alternative high schools in the district. The theory behind an alternative high school is that students attend to make up missed classes, have special needs taken care of, sometimes by court order, and then return to their host school. Pupil-teacher ratio is typically small. At Canyon it averaged 15 to one.

School Environment

The physical environment of the public areas at Canyon were austere in comparison to the vocational high school which it adjoined. Outside, a police car parked next to the child care center was a reminder of the permanent presence of police at the school. The faculty parking lot was surrounded by a chainlink fence, something not seen at the other schools in this study. The interior public areas of Canyon South included gray cinderblock walls, gray floors, and a floor-to-ceiling sign that detailed the building rules, including the fact that search dogs could be used at any time without prior notification.

During my first visit, a young student sat at a table in the hallway, chewing on a pencil while completing what appeared to be a form. Next to him, slumped
on a chair, was an older man who appeared to be intoxicated and not able to sit upright. The classrooms, by contrast, were typical of any high school in the district with good lighting, some computers, walls covered with student work, and teachers moving among the working students.

School Staff

What happened on my first visit illustrated one reason why students liked going to Canyon. I entered the office and was greeted, almost simultaneously by two clerks, one at each side of the door. “Welcome to Canyon,” they said. One then asked, “May I help you?” I responded that I had an appointment with Carl and the clerk told me he would be there shortly. She then asked if I wanted coffee and directed me to a small break room to the side of the main office where the teachers were having their morning break. Most of them greeted me and asked if I was a parent or a visitor. I told them I was there to meet with Carl, and they assured me he would be along shortly. I found the distinction between parent and visitor interesting.

I returned to the office and sat on a couch. While I was waiting, I observed one of the clerks reprimanding a student for having been absent for three days. She said, “Girl, don’t you know you are going nowhere without a high school diploma. What’s the matter with you. This is the second time in a month.” The girl responded with a long narrative of why she had been absent. The clerk looked at her and shook her head, putting one hand on her hip and pointing a finger at the girl as she spoke. “That’s not going to cut it,” she said. “Don’t you
know we care about you? Don't you know we care what happens to you? Don't you let me see you in here again for absence. You hear?" The girl and her friend smiled and walked out of the office. It was a friendly exchange, even with the clerk's reprimand of the girl.

School Principal

I was sitting next to a woman who was greeting students and engaging them in conversation as they walked into the office. She had a firm but kind manner about her while asking students personal and school-related questions. They responded to her warmly. During a break in student traffic, she turned to me and asked if I was visiting. I told her I had an appointment with Carl and she said immediately, "Oh, he'll be here very soon. His class just ended and he always stays a while to talk to students. By the way, I'm Mrs. Coral, the principal." Every contact I had had up to that point had made me feel welcome. I sensed that this friendly, caring atmosphere and attention to the individual was part of the standard operation at Canyon South. I found it to be so every time I visited.

Participant Description

Soon after I began speaking with Mrs. Coral, a man entered the office carrying a stack of books. He was tall and had a thin build with slightly stooped shoulders. He had gray hair, a mustache, and a trim beard, and he wore brown-rimmed glasses. When he saw me he came forward and smiled while extending his hand. He shook my hand with a firm grip, and launched into a series of
sentences without taking a breath, “I’m Carl. You must be Teresa. Welcome to Canyon. I’m sorry I’m late but I had to talk to some students. Would you like some coffee? Follow me. There’s some in the break room. It probably tastes like mud, but I need something now. How about you?” So began my too-short acquaintance with Carl, the Candy Man.

Carl was a math teacher at Canyon South. He was in his third year of teaching, with Canyon being the only school at which he had taught. He was retired from the Air Force and had returned to school to obtain his teaching license. Carl was in his early fifties, with a degree in engineering that he said he had never really used in the Air Force. Carl was responsible for teaching Algebra 1 and 2, Technical Math, and Contemporary/Consumer Math. His students included all high school grade levels.

**Personality Type**

Carl had agreed to complete the MBTI during a phone conversation. He had mailed it to my home, and I found that he self-reported as an ENTP. Of the two volunteers who self-reported as NTs, Carl had the stronger preferences. I asked him to participate in the study to which he agreed enthusiastically. School District personnel had identified three other career-change teachers at Canyon South as possible participants for the study, but they had declined to participate because of other commitments. Table 3 provides a synopsis of characteristics attributed to Intuitor Feelers.
Table 3

Quadrant View of Personality Types as Identified by the Myers-Briggs Type Indicator

<table>
<thead>
<tr>
<th></th>
<th>Case One: Art Doris</th>
<th>Case Three: SF Sensing + Feeling</th>
<th>Case Two: Barb NF Intuition + Feeling</th>
<th>Case Four: Carl NT Intuition + Thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Focus on:</strong></td>
<td>Facts</td>
<td>Facts</td>
<td>Possibilities</td>
<td>Possibilities</td>
</tr>
<tr>
<td><strong>Handle these with:</strong></td>
<td>Impersonal analysis</td>
<td>Personal warmth</td>
<td>Personal warmth</td>
<td>Impersonal analysis</td>
</tr>
<tr>
<td><strong>Thus tend to become:</strong></td>
<td>Practical and matter-of-fact</td>
<td>Sympathetic and friendly</td>
<td>Enthusiastic and insightful</td>
<td>Logical and ingenious</td>
</tr>
<tr>
<td><strong>Find scope for their abilities in:</strong></td>
<td>Technical skills with facts and objects</td>
<td>Practical help and services for people</td>
<td>Understanding &amp; communicating with people</td>
<td>Theoretical technical developments</td>
</tr>
<tr>
<td><strong>For example:</strong></td>
<td>Applied Science Business Production Construction, etc.</td>
<td>Patient care Community Service Sales Teaching, Etc.</td>
<td>Behavioral Science Research Literature &amp; Art Teaching, Etc.</td>
<td>Physical Science Research Management Forecasts &amp; Analysis, Etc.</td>
</tr>
</tbody>
</table>

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After completing the MBTI, Carl had read Myers' (1993) *Introduction to Type* , the booklet that I had included in the mailing. He agreed that Myers and McCaulley's (1985) description of ENTP fit him:

... ingenious innovators who always see new possibilities and new ways of doing things. They have a lot of imagination and initiative for starting projects and a lot of energy for carrying them out. They are sure of the worth of their inspirations and tireless with the problems involved. They are stimulated by difficulties and most ingenious in solving them (p. 28).

**Prefer Possibilities and Innovation**

Carl shared his innovative ideas about curriculum development with me.

He said:

If I had a lot of money, I would take the summer off and go around to a lot of businesses in town. I would collect information that I could make into problems about the real world. I'd go to a florist and find out how they calculate orders, or to a car dealer and look at the math they use. I'd go to banks and retail stores. Then I would develop a whole series of worksheets with real-world problems. That's what the kids need, real-world applications.

**Stimulated by Difficulties and Their Solutions**

Carl's focus on difficulties and on ways to solve them, as Myers and McCaulley (1985) described ENTPs , was evident in his educational experience and in his classroom methods. Hirsh and Kummerow (1989) wrote of ENTPs:

Because of their ability to see relationships and connections between seemingly unrelated things, they are able to realize the potential in many things. When they see an opportunity that others have missed, they set action-oriented strategies that allow them the greatest flexibility to achieve the results they want (p. 247).

Carl took action to achieve desired results when his licensing program was delayed because of local university requirements. Carl simply went elsewhere:
I got to just about the point of student teaching and then they said, 'well you need this course and that one course.' And I said, 'I just can't play around like this.' What really convinced me that I was in the wrong program was I went down there to take a one-hour summer class. Whoever was teaching this ... there were 70 seats in the class and he or she would only allow 18 students. It was a four-day class. They were going from 8 in the morning until 11 o'clock. So I would have to wait another year to take this class and I said, 'I'm not going to do this.' So I went down to [another local university]. I said, 'This is who I am.' It was like late August. And I said, 'I would like to student teach. When can I student teach?' And they said, 'how about October 1?'

**Improvise to Overcome Challenges**

Hirsh and Kummerow (1989) noted that ENTPs “have faith in their ability to improvise and to overcome any challenges that they face” (p. 245). In the classroom, Carl encountered many challenging situations in this alternative school, situations he seemed to thrive on solving. He described a strategy he used at the beginning of a course:

I give them a form each time they come into my classroom [at the beginning of the semester or quarter] ... At the top I put 'What is the best thing that ever happened to you?' 'What is the worst thing that ever happened to you?' And initially, nothing good ever happened to them ... and so I try to get them to think positively. And I think I have referred four kids [to counseling]. And you start reading these things ... wooh! And I started reading this one and it was like reading a suicide note. And I referred it to the counselor and she read it and she said, 'Yup.' These kids we're getting ... we're not so much getting kids that are tougher to teach. We're getting kids that have more problems.

Carl worked hard at helping students improve their language and eliminate curse words. He gave an example:

I had this one girl two years ago who said, 'Mr. C how long have you been teaching?' I said, 'I've only taught for one year. 'Well what did you do before that?' 'Well I was in the service for 20 years. 'Oh, well that's why you don't like us cursing.' I said, 'No, I want you to go get a job.' I said,
‘You can’t get a job if you talk like that. I don’t want to support you all my life [laughing]. ‘What are you talking about?’ she said. It’s funny when you start talking like that. It’s funny. Their eyes change like, this is different. ‘I haven’t heard this before. No one’s ever told me that.’

Consider Parenting as Opportunity for Growth

Kroeger and Thuesen (1988) described the ENTP parenting characteristics as “an opportunity for the growth and development of everyone involved” (p. 263). They continued with “It was probably an NT parent, most particularly an ENTP parent, who first said, ‘A mind is a terrible thing to waste’ (p. 263). “ Carl spoke proudly and at length about his two daughters and how they were doing in school. Carl mentioned that his older daughter was a junior at a state university, majoring in physics. He said she had had a “tough time of it” but had overcome some barriers to her learning in a math class. I asked if he had been able to help her with it and he replied, “Not much. It has been a long time since I took that class. But she’s doing fine now.”

Carl also spoke of his younger daughter, a junior at a local high school, saying “We’re very proud of her. She’s doing well academically and it’s a tough school.” Most of the conversation about his daughters was focused on their academic work with one exception. He said, “We’re very happy that [older daughter] is coming home for the summer. We really miss her.”

Finds Problems and Complexities an Exciting Challenge

Myers and McCaulley (1985) described the effects of the sensing-intuition function in work situations. “Intuitive types,” they wrote, “like solving new
problems ... are patient with complicated situations" (p. 80). Mrs. Coral, described the process Carl had gone through to select a new math series for the school:

We were given additional money to buy textbooks. Well Carl and our other math teacher took that very seriously. They just didn’t go out and buy the textbook. They researched it and they researched it and they went to different schools. They went to [another alternative high school]. And what they found was that there wasn’t one particular textbook that they felt would really meet the needs of our students here. And yes, we did get a class set, but what I found in Carl as well as in the other teacher is that they are very creative. And that’s one of the things that needs to take place.

Mrs. Coral continued talking about the creativity of Carl and the other math teacher:

Yes, we need to follow a curriculum and we realize that these students are exiting other programs and moving from different areas in the city or state so there’s got to be some kind of sequence. But we need to reach the kids where they are and we can’t just follow a textbook and go Chapter One, Chapter Two. So I know they’re creative in some of the things that they’re doing, especially hands-on activities.

Prefer Autonomy and Little Structure

Myers and McCaulley (1985) wrote that Perceptive types “Adapt well to changing situations” (p. 82). Hirsh and Kummerow (1989) wrote that “ENTPs seek autonomy for themselves and encourage it in others. They want things at work to have only as much structure and bureaucracy as is necessary in order to allow for creativity” (p. 250-51). Carl had been given a great deal of autonomy by the previous principal whom he described as “laid back.” Mrs. Coral was more
involved in the staff’s teaching and in the students’ daily activities than the previous principal. Carl related:

Yeah, you can go and ask her questions and all that. This year’s a little different. This is the first year she took over. And we had a gentleman last year, the last two years … Mrs. Coral is really more hands-on. She going to ask questions and stuff like that, where [the previous principal] was way back here. ‘OK? Everything’s OK?’ he’d say, and [I’d say] ‘Yes sir.’ And that was the extent of his supervision. So there’s a little bit of friction in trying to get used to that. It’s good but different.

From my years of type watching, I had guessed that Mrs. Coral was most probably an ESTJ. In Type Talk at Work, Kroeger and Thuesen (1992) described ESTJs as “a take-charge type with very high control needs” (p. 372). Carl’s preference was for flexibility and autonomy. As Hirsh and Kummerow (1989) wrote, “ENTPs hate uninspired routine and resist hierarchical and bureaucratic structures that are not functional. They need freedom for action” (p. 245). The dramatic difference between the two principals’ styles may well have been the source of Carl’s conflict in adjusting to a new supervision style. Carl did note that he was given a great deal of freedom in the classroom but that now there was more direct accountability.

Enjoy Reading for Quiet and Reflection

Hirsh and Kummerow (1989) wrote that “ENTPs enjoy reading because it offers them quiet and the opportunity to reflect. Reading also allows their active minds to fantasize further. They often read between the lines and anticipate the outcomes” (p. 254). This aspect of Carl’s personality type was reinforced for me in a brief exchange we had as we met for the initial in-depth interview at a buffet
in a large hotel. When he came toward me he was carrying a biography of Colin Powell. He pointed to it and said, “In case you were late.” I asked him if he read a lot for leisure, and he answered, “All the time, when I can get the time, but there’s never enough of it. It’s escape and relaxation.” When I asked Carl what his preferences were in leisure reading, he responded, “Non-fiction, usually biographies and history.”

**Career Choice Data**

Carl, an ENTP, was a high school math teacher in his second career. He had a degree in engineering and had been a career Air Force officer prior to returning to the university to earn his teaching license. Hirsh and Kummerow (1989) wrote that “the preferred work settings of ENTPs contain some independent thinkers working on real ways to solve complex problems, often by applying conceptual models. ENTPs favor work environments that favor change, are flexible, reward risk, and focus on competency” (p. 250).

Myers and McCaulley (1985) reported on the career choices of ENTPs collected by the Center for Applications of Psychological Type (CAPT). The representation of Carl’s type in careers is detailed in Table 12. CAPT figures indicated that 18.19 percent of NTs selected teaching, with 11.86 percent at the high school level and 23.94 percent selecting math. CAPT data also indicated that ENTPs teaching math were a low 4.23 percent of the almost 17,000.
Table 12

ENTP Career Choice Samples

<table>
<thead>
<tr>
<th>CAREER CHOICE</th>
<th>ENTP % OF TOTAL</th>
<th>NT % OF TOTAL (includes two personality types that share NT—ENTP and ENTJ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>teaching at all levels</td>
<td>3.64%</td>
<td>24.1%</td>
</tr>
<tr>
<td>high school teaching</td>
<td>3.54%</td>
<td>20.5%</td>
</tr>
<tr>
<td>mathematics teaching</td>
<td>4.23%</td>
<td>22.1%</td>
</tr>
<tr>
<td>engineering</td>
<td>5.98%</td>
<td>23.0%</td>
</tr>
<tr>
<td>military</td>
<td>5.3%</td>
<td>10.0%</td>
</tr>
</tbody>
</table>

Teachers in the sample. ENTPs teaching high school were also low in representation at 3.54 percent, and for engineering, also a low 5.98 percent.

To find a strong representation of NTs teaching high school math, one must combine the four personality types that share the NT functions. The CAPT data bank figures for teachers indicate that the 23.94 percent who selected math were a combination of four psychological types. These personality types share the NT functions: INTP (8.45%), ENTP (4.23%), INTJ (7.04%), and ENTJ (4.23%).

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Carl selected three careers where the NT functions of his personality type were well represented: engineering (27.38%), the military (14.77%), and teaching (18.19%). He talked about the path he had taken to his current career:

I was getting out of the service and I had two years to go. The original idea was I was going to go back to update my degree [civil engineering]. I figured two years to do that would be pretty good. And I went down and talked to professors at [a local university where he was stationed]. They liked the idea because I had managed people and I figured I could manage an office of engineers. That worked out pretty good until they put me in third-semester calculus. I had a really good teacher but I was going back and taking my daughter's Algebra book and reviewing, oh the little things you forget, the tricks and stuff. And I just said, 'there's no way I can do this with chemistry, physics, and thermodynamics. You know I'll be here for five years.'

Carl then talked about what had turned him to teaching after he decided he couldn't update his engineering degree.

I was an instructor in the service and I enjoyed that. I knew I could do that, so I switched on over. I did that, part of it at [one local university] and the last part at [another local university]. I'll be honest with you. [The first university] was not very responsive. I was 42 years old, married, two kids. Put me in the classroom. If I don't make it, I don't make it. There wasn't ... I had the confidence. They said, 'No, no, no. You need to do this and you need this. They didn't know what to do with someone like me.

Since I was familiar with the Air Force instructor training procedures, we talked a bit about the intensity and thoroughness of the courses. Carl agreed that they "closely paralleled a number of the courses [he] had taken in [his] licensing program." Even though the preparation was similar, Carl felt "shortchanged" because he was not given credit for his prior experience until he went to the second university where he completed the requirements for his license.
When asked about his long-term professional goals, Carl said:

I probably haven't thought enough about that. Ah, there are times when I think I'd like to go back and get a degree in counseling, and probably go back and get a masters in math.

Asked if the idea of a degree in counseling was stimulated by the environment in which he worked, he responded, "Oh, yeah. You mean the kids I work with? There's no question about that." Lawrence (1993) wrote that "ENTPs [are] more enthusiastic, more concerned with people and skillful in handling them. Much drawn to counseling, where each new person presents a fresh problem to be solved and fresh possibilities to be communicate" (p. A-15). Had Carl pursued his goal of a counseling degree, he would have joined a notable number of NTs in the profession. The highest percentage (45.81%, N=1,803) of personality types who select counseling are in the NF quadrant; however, the percentage of NTs who select counseling, according to the CAPT data bank, is 16.18, with N=1,803 (Myers and McCaulley, 1985, p. 260).

**Learning Style**

In describing what the concept of learning styles describes, Jonassen and Grabowski (1993) wrote that it:

... describe[s] learner preferences for different types of learning and instructional activities. These styles are generally measured by self-report techniques that ask individuals how they think they prefer to learn. As such, they are not tied directly to mental abilities, but rather to more general learner perceptions of their own preferences (p. 5).

Lawrence (1993) described how the N and T preferences affected learning.

Intuitors (N), he wrote:
prefer learning assignments that put them on their own initiative, individually or with a group; real choices in the ways they work out their assignments; opportunities to find their own ways to solve problems; opportunities to be inventive and original, opportunities for self-instruction, individually or with a group; a system of individual contracts between teacher and students (p. 44).

Preference for Contracts

Carl had a system of contracts with his students. He had folders in the back of the classroom with each student's learning contract and work. At the beginning of each class, students came in and picked up their folders to look for corrected work and identify the next assignment. Carl said that this system was driven in part by the enrollment flux among the students, and in part because he believed in individual learning agreements tailored for and with each student.

Preference for Theory

While we were discussing the results of his MBTI, I mentioned to Carl that Intuitors were often big-picture people, abstract and preferring theory before action. Carl related that his military career had included using a great deal of theory of warfare as a basis for the planning he did:

Myself, I'd say, yeah, probably big picture ... and I think that's because of what I did in the service. The last five years, I used to write war plans [laughing]. Those tend to be big-picture type things [laughing]. You had to where you normally didn't start from scratch ... those I had to do that one time, for drug enforcement ... so, but you get a lot more ideas in there sometimes.

I asked Carl how he would learn a new piece of software to get at his learning style. He responded:
... probably just play with it and read the instructions. You know it’s interesting. I think the assumption is that because I’m in math I love computers and I’m into the software stuff. For some reason I missed that [laughing]. I mean I own a computer at home and my thirteen-year old knows more about that computer than I do. She’s all the time playing with it and ‘Oh, Dad. Look at this.’

Preference for Getting Involved

Kroeger and Thuesen (1988) wrote that “ENTPs would much rather learn by ‘getting involved’ than by being lectured to” (p. 264). Mrs. Coral mentioned that Carl’s constant quest for learning and improving his teaching resulted in his volunteering to be on almost any and every committee that was formed:

We sat in committees, because there’s moneys available in the school, you know, if you do this project, if you do that project. Everyone is overwhelmed. Everyone is saying, ‘How do you do it with what I’m teaching?’ And all of the teachers here love the kids and they go the extra mile for the kids. He’s the only one, that after everybody talked, after the committee met, he would come and say, ‘Mrs. Coral, I think I have the extra time to do that.’ And not only would he talk the talk, but walk the walk. He would call the person.

Mrs. Coral also talked about Carl’s additional involvement with the mission of the school:

He was working with the school back-to-work program trying to get extra credit for the kids through work experience. He was on the committee trying to get partnership with the base [local military base] and other programs shadowing with our kids. So he wasn’t just the classroom ... things he did outside the classroom ... things that he did that I didn’t even know [until Carl left]. He had a partnership going with [the vocational school] and they were doing some activities together.

Teaching Style

Teaching style encompasses the strategies and media the teacher uses in the classroom. Media is any object used to carry the instructional message.
Findings on Carl's teaching style include a description of his environment and students, data collection instruments and strategies and media used during the Nine Instructional Events (Gagné & Briggs, 1974).

Environment and Students

I observed Carl for six class sessions over a period of five weeks. I was not able to conduct further observations because of illness that caused him to leave the school.

The classes I observed were a combination class that included students in pre-Algebra, Algebra 1 and Algebra 2, and a Contemporary/Consumer Math course. Carl's classroom was one of five mobile units parked next to the gym used by the vocational high school. The walls were covered with cartoons on student topics and with motivational posters extolling quality, determination, success and excellence. A large jar of candy sat on Carl's desk in a classroom crowded with multi-colored desks and seven computer stations.

Though set up for thirty students, his classroom never had more than fifteen students in it. The population of the classes was constantly in flux during the sessions I observed. I saw only half of the students on a repeat basis for more than one session. There were new faces and faces missing each time I observed. Such was the nature of this alternative high school. The demographics, however, were fairly constant. The first time I observed the combination Algebra class, the students included 11 Caucasians, one African-
American and two Hispanic students. This group included eight males and six females.

Carl introduced me to the class each time I visited and each time explained that I was working on my dissertation. Each time, students would ask him to explain what a dissertation was and he would say, "It's a long study, probably about 400 pages, right?" and would look at me and smile. Students would then ask if I was going to write about them. I responded that I was studying Carl's teaching. They usually laughed and said, "We could tell you a lot about his teaching." Carl was the only one of the four participants in this study who made sure on a regular basis that the students knew who I was and why I was in the classroom. He noted that students were "used to being observed" but that it was important for them to know "who was observing them." This was yet another example of how Carl attended to individual feelings and of how he maintained an environment of respect for the students. My frame of reference for observers in the classroom included a prototype teaching situation where visitors had been marched through the classroom on a regular basis and never introduced. Students had been pointed out more as exhibits than as people. This was not the case in Carl's classroom where visitors were included as part of the class and invited to share in activities.

Data Collection Instruments

During our first meeting, I explained to Carl the checklist I would be using to observe him. He took a great interest in it and asked if I would add anything to
it if I saw him do something that wasn’t on the checklist. He joked about using strategies that might not be in textbooks.

The data does not include videotape information since Carl became ill before we could get all of the permission slips returned for the taping. Even after he was home on sick leave, he volunteered to try to return to the class for a videotaping so as not to “short-change your study.”


**Gaining Attention**

Carl’s method of gaining attention with his two classes varied, depending on the day’s work. With the combined Algebra class, students regularly walked in and looked in their folders for previous work and then returned to their seats. Carl began this class by announcing he would take questions about the corrected work. Students raised their hands, and Carl walked around to each person. After all the questions had been answered, he began the day’s lesson.

With the Contemporary/Consumer Math class he used announcements to gain attention. This groups had also looked in their folders on coming into the room. They generally worked on the same project so there was little question and answer activity for this segment. In all, Carl used advance organizers twice, announcements four times and question and answer segments.
Table 13
Checklist Summary of Case Three Instructional Strategies and Media

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<td>Ques. &amp; Ans.</td>
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</table>

* N=210  Total number of instructional strategy and media use incidences tallied

four times during this instructional activity. Once during this segment, Carl took a student to task for his language. After class I asked him about it. He said:

There's a certain amount of rebellion you're going to get and I try as best I can to keep the language at a civil level in the class. And maybe you'll notice how I say a name and then I'll do this [taps his lips] and most of them apologize. Where a year ago they'd say 'well what did I say?' And I

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go 'no, no, no. We're not going to play that game. You said something inappropriate,' and they do and they don't realize it. It's just such a habit.

**Stating Objectives**

Carl stated the day's objectives with announcements twice and directions three times. These tended to occur in the Contemporary/Consumer Math class where all students worked on the same project. In the combined Algebra, students usually took their assignments from their folders and worked independently or in pairs.

**Prerequisites**

In the Algebra class, students were paired according to the lesson they were reviewing. There were no large-group Prerequisite activities. In the Contemporary/Consumer Math class, prerequisites were covered with one announcement and three large-group activities.

**Prestimulus**

In the Algebra class, students worked individually using lessons in their textbook. Occasionally Carl had them work in pairs. This was for review prior to introducing new assignments. In the Contemporary/Consumer Math class, students worked on large-group activities usually from worksheets used for activities for two days. For this instructional segment, Carl used directions twice and lectures twice. He used lecture-demonstrations with the chalkboard five times, twice with the Algebra classes and three times with the Contemporary and Consumer Math class. He used question-and-answer segments twice.
Providing Guidance

Carl used the greatest variety of instructional strategies during this event. During the combined Algebra class, Carl occasionally answered a student question by working out a problem on the chalkboard with the student's help. Other students, working on individual assignments, tended to stop their work and join in the chalkboard activity. Carl noted that they used these spontaneous demonstration sessions as reviews for their own work, regardless of what lesson they were completing.

During this Providing Guidance event, Carl gave directions twice and conducted a class discussion once. He presented demonstrations twice in the Contemporary/Consumer Math class and once in the Algebra class and gave feedback 13 times. Carl conducted large-group activities five times in the Contemporary/Consumer Math class and lectured once. He worked one-on-one with students 25 times and conducted question-and-answer sessions nine times. The media used during this segment included the chalkboard seven times, worksheets twice, and other paper/pencil once. During this segment, I had noted how quietly students raised their hands and waited patiently for individual attention. Carl said:

'I'll be honest with you. If I go to a student like multiple times, they actually apologize for asking questions. And I'll say, 'Wait a minute. You do not upset me. Somewhere along the line they've been told, 'You're bugging me. This is inappropriate behavior.'
One day while I was observing I counted five students with their hands raised. Carl correctly responded to the students in the order in which they had raised their hands while managing to attend to large-group needs. I asked him later how he kept track of what order the students had raised their hands. He responded that he "just knew." This "withitness" characteristic (Kounin, 1970) is described in personality type literature as more characteristic of Sensors (Myers & McCaulley, 1985). In a later conversation, Carl noted that he had had to develop that "sixth sense" of what was going on in a group when he was in the military. He identified it as a management skill.

**Eliciting Performance**

To elicit Performance, Carl also used a variety of strategies and media. He gave directions five times, structured a small group activity where students worked in pairs in the Contemporary/Consumer Math class, and used lecture demonstrations with student help three times. In the combined Algebra class, he worked with students on one-on-one assignments eight times and used question-and-answer segments 14 times. In the Contemporary/Consumer Math class, Carl used the chalkboard twice to elicit performance, worksheets seven times, and other paper/pencil once. Carl used humor twice during this instructional segment to gently nudge them into thinking more clearly about the problems he was presenting and about the strategies they were using to solve them. He also gave students oral problems to solve in each of the two classes and the winners were given candy.
Carl talked briefly about his teaching strategies and use of media during our initial interview:

My belief is that theory will come out of their ... when they start applying it. It's kind of like the other day with the trapezoid lesson. I explained trapezoid real quick. Surprisingly, most of them knew what that was. I was amazed. And the area of a trapezoid ... oh. 'What's this A, B, A prime.' So you know you have to go over a little bit of that. And those sheets are very good about that. You know you walk them through, take your time, which allows them to succeed. If I just gave them, 'OK, I want you to tell me the area of this, this and this, and they get 50 percent of that right, they're not feeling some success.

Mrs. Coral talked about Carl's preference for hands-on work:

He was unique. Like sometimes you see he would come in in the afternoon and he would tape the hallway here and we would have no clue what he was doing. And the next day the kids would come in and they were measuring this. And you could see it in the kids' expressions. They were excited.

Feedback

Carl used positive feedback extensively throughout all the instructional segments. In the formal Feedback segment following the Eliciting Performance segment, he gave feedback using a variety of strategies including humor, candy and probing question-and-answer segments. He used feedback extensively for classroom management also. Talking about how his service experience helped him with classroom management, he gave an example:

You know I had a girl last year... two years ago. I mean I don't know what happened at home or on the bus before she got to my classroom but when I said, 'Hi. Can you open your book please? Hi.' She's cursing and screaming and yelling. She's got me thinking, you know, what is this about? So I go over and say, 'You're not being a student in my class. You know you'll have to leave. You can be a student in my class or you'll leave. And she came back to me later and said, 'You know you never
yelled or screamed at me, even though I cursed.' You just have to get beyond that. Unfortunately, what happens is when they start that, I do go click. I bet if you ask me three minutes later what they said I couldn't tell you.

**Assessment**

Assessment was ongoing with the combined Algebra class because of the individual learning contracts. Each day students received written feedback on the previous day's work when they looked in their folders. Carl used a combination of scores on class work and homework, along with what he called "subjective" grades on effort. Because of the nature of this alternative high school, attendance was also part of the grade. Many of the students were at Canyon South because of chronic truancy, so attendance took on major importance and affected the effort grade as well. Candy was the in-class reward for any students who had five consecutive days of attendance. Carl gave bags of candy to those students, who invariably shared them with other class members and me on the Fridays that I was in the class.

**Enhancing Retention and Transfer**

I saw only one example of this strategy while observing Carl's classes. At the close of a day's class with the Contemporary/Consumer Math students, Carl directed them to be prepared for a worksheet activity for the following day that would build on one they had done previously. At the beginning of the next class, he queried them on the prior activity before beginning the new one.
During the time I observed Carl's classes, students often went to the computer stations once they had finished their work. I noticed they were all playing games on the computers. Carl explained that they enjoyed playing computer games so he used it as a reward. He said he hadn't had time to integrate computers into the curriculum but he wanted to. He added that the students had opportunities to use computers in other classes. On two occasions, there were students from other classes who had come in to use the computers for projects. They sat quietly at the computers and did their work while Carl's class was in session.

Other Factors Influencing Teaching

Influences on Carl's teaching, other than his personal learning style, included his education, administrative support, availability of resources, prior experience, and his beliefs about students.

Influence of Education

Carl spoke quite favorably of the supervisor he had as a student teacher:

It was interesting. She was just coming back from getting her masters in math. They didn't tell her she had a student teacher coming in [laughs]. So that kind of surprised her. It was really a nice mix for us because our age was fairly close. She was right around 40. So we could talk about how the profession was going and changes in the profession versus 'hey, you need to present this in this way.' In fact, I'll be honest with you. 'When they did an evaluation ... I went in there and said, 'in the Air Force I'm used to more like open heart surgery. I've been nit-picked to death.' I know it's nothing personal. I can take this; I'm pretty thick-skinned.' They said, "No, no, no. You're doing good; you're doing good. So it was really different for me ... that portion of it.

Mrs. Coral spoke of Carl's willingness to continue his professional growth:
He probably participated in every inservice provided by the district as a whole, the university, any association, math association. Not only did he participate but he managed to always take someone else with him. So not only was he gaining the knowledge and experience, but he is the type of person that wanted his staff to go.

Though Carl did not cite education course work for licensing as having a major impact on his teaching, he did demonstrate the NT preference for the new and innovative while in his teaching position. He said he looked for "real-world applications" in every inservice he attended. He felt that his goal of making math useful for his students was served by ongoing professional development.

Influence of Administration/Supervision

Although the school district had general goals and objectives for the high schools, according to Mrs. Coral, how the teachers reached those goals was left up to their own judgment:

I find that in alternative education we're kind of ... it's almost like being a bilingual/bicultural person. You select what's good from secondary, what's good from alternative and you dismiss the things that are not being productive...

A common prep period offered additional tools for Carl to identify and work with specific students. Mrs. Coral described typical activities of the prep time:

So not only are they talking strategies as part of their everyday kind of deals, but they're also talking about individual students' needs ... it might not necessarily be that in math we identified the student having high ability... it might be that in an English class or in a Social Studies class the student might have made a comment that 'I was taking calculus in another school.' That is communicated to Carl so that he has a different assignment for that kid that he might not have recognized before. So [it's] communication in terms of the students and the abilities that the students are showing, or the lack of ability that the students are showing.
Availability of Resources

The only resources that Carl felt he was lacking were more real-world examples of math applications. He used problem solving worksheets from Bransford and Johnson's (1973) "Considerations of some Problems of Comprehension" and "The Building Game," a series of problems having to do with construction estimates. As noted before, his wish was to compile problems having to do with businesses in the area so that students would get more practical math application practice.

Influence of Prior experience

Carl noted that his Air Force instructor training had been the biggest help to him in terms of developing curricula, teaching subject areas, and classroom management. He identified the practical aspects of his engineering education as having strengthened his focus on real-world applications of math. Carl also talked about his struggles to find a teacher licensing program that was right for him, and of the benefit of having a goal and identifying the necessary steps to reach that goal. These life experiences, he said, were part of what he was trying to communicate to his students.

Influence of Beliefs

Carl's belief in the importance of maintaining the dignity of his students was demonstrated several times. He noted that it was important to identify
positive aspects of individual students and try to work to raise their self esteem for as long as he had them.

You know, like that kid George. You know I really like George. He's friendly and can converse and stuff like that. Unfortunately, George is probably heading back to [the juvenile detention facility] here one of these days because he unfortunately can't stay away from the dope.

During a post-observation interview, Carl spoke of a Hispanic girl's ongoing achievements, despite severe obstacles:

She's 16 years old, married and has a baby she has over there at the child care center. When she leaves here every day she goes to a full-time job. She's seldom absent and always has her work done. She's amazing.

Mrs. Coral spoke of Carl's being very respectful of the students "of their intellects, of themselves as human beings." She added, talking about Carl's skills:

And see how do you teach that, because that is the way that person is. Because you would hear the same comments about the staff ... the way he treated the staff, the way he treated me personally. And that's the key. That's what made him such a great teacher. The caring, the responsibility, and that gift that he had to look at each person individually with respect.

Case Three Summary

For the Nine Instructional Events, Carl used 19 strategies and media (see Figure 7). His dominant strategies were one-on-one activities, lecture demonstrations, and question and answer segments. Carl used Feedback extensively, both during the Providing Guidance and Eliciting Performance segments as well as for classroom management.
Discussion

Myers and McCaulley (1985) identified type differences in teaching styles. For the Intuitor Thinker they detailed six characteristics. Given the limited data on Carl, I found most of Myers and McCaulley's descriptions were consistent with his learning/teaching style.
Role of the Teacher

"The role of the [NT teacher] is to encourage, inspire, help students develop as citizens and persons" (Myers and McCaulley, 1985, p. 135). Carl’s goal was to prepare students for their adult life by giving them personal and professional skills that would stand them well wherever they went. He spoke of the need to build student self-esteem on a number of occasions. He was also a realist, talking about how important it was for students to get work skills to succeed not only professionally but also personally. His teaching was constantly aimed at the practical first, the theoretical second. In that aspect, he departed from the typical NT teacher who often focuses theory first and application second (Myers & McCaulley, 1985, ), yet he was a typical NT teacher in other aspects such as searching to reach students however he could with innovative lessons and by emphasizing possibilities.

Curriculum Planning

Carl demonstrated Myers and McCaulley’s (1985) description of the NT that included: "Ideas for teaching come from ... concepts from subject area, knowledge of students' needs and development, synthesis of ideas from many sources" (p. 135). While discussing how a person with Carl’s learning style might approach planning, Carl said:

If we apply this to just what I want to teach, I tend to look at a thing and say, 'I like this. I don't know why. I'll look at it and, oh yeah, I see where the kids could get this. Like I do a thing with M & Ms where we counted the blue ones and brown ones and the red ones and so forth. And from there we go talk about percentages and so forth. Cause I could see how
the application comes here and actual use of the numbers and then we could talk about percentages. It's hands-on and that's kind of what I like. I look for stuff that's hands-on for them.

Lesson Planning

Myers and McCaulley (1985) wrote that for the NT, "Teaching is planned by ... making a plan according to overall yearly structure; organizing concepts or themes; determining details by student levels" (p. 135). Carl structured his lesson plans to meet the curriculum objectives for the subject areas but individualized the learning activities to meet student needs. Carl talked about his focus on theory coming from application. He felt that students would be able to articulate the theory if they had practice in the application first.

Teaching

Carl embodied Myers and McCaulley's description of the NT as a teacher for whom the "typical method teaching is described as having a flexible daily routine that depends on topics and student need, with interaction based on expectations for order and learning" (p. 135). While talking about his teaching style, Carl related that all of his classes had a strong hands-on aspect to them with as many real-world applications as he could find. He noted that the individualized learning and small-group activities were driven in part by the nature of the school and the attendance patterns, but also by his preference for individual work.
Evaluation/Assessment

Myers and McCaulley (1985) described the NT teacher's assessment methods as including: "Students' work is evaluated by using a number of factors" (p. 136). Carl's constant focus on creating success-filled days for the students was evident.

What I try to do with these kids ... I don't want them to fail and so ... I remember last year I had one of [special education teacher's boys]. He would come every day and he would work and every day I had to explain fractions on the calculator to him again and he would work. And if I sat down and graded him it would have been very low. I kept giving him hundreds every day because otherwise he would have stopped working and stopped coming. There's some of that and there's some grade and 'let me see what work I'm looking for' ... You probably shouldn't always give a hundred but most of the time I'd give [it to] him, because I didn't want him to get to the point of quitting.

Carl used a variety of strategies for Evaluation/Assessment that included both effort and attendance. The learning contracts negotiated with students were the primary criteria, the goal being to meet the school curriculum goals and expectations for the grade level and course.

Criteria for Success

Myers and McCaulley (1985) described criteria for success characteristic of the NT teacher as including, "The teacher feels successful if students have increased involvement with learning" (p. 136). Carl spoke enthusiastically of "small victories" when students felt successful enough to keep coming back to class despite prior records of chronic truancy:

For some kids you'd say, 'Hey, take another look at this,' and you've got to have a feel for which one you'd do that with. Like if you say, 'Do this.
You can figure it out.' They sit there and say, 'I can't do this Mr. ____.' 'Come on. We did this yesterday. You can do this.' They come into the classroom with two things. One thing, they have failed in school, and someone along the way has told them that math is a very difficult subject. I have kids that come in and say 'I'm not any good in math.' 'Who told you that?' And so you've got to work that out and they end up doing very well.

**Conclusion**

From the data collected during observations and interviews with Carl, it would appear that (a) he was teaching predominantly to his learning style, and that (b) the ENTP teacher characteristics are well matched to the teaching priorities of an alternative high school (see Table 14). These priorities, as discussed by Mrs. Coral, the principle, and demonstrated by Carl include: (a) flexibility in working with continually changing student populations with special needs; (b) tailoring curriculum to individual student needs; (c) establishing a caring, supportive and success-filled environment; (d) tailoring curriculum to practical applications; (e) demonstrating flexibility in assessment; (f) using strong classroom management skills with students who have histories of difficulties in observing boundaries.

The only finding in this case that was non-characteristic of an NT teacher was Carl's feeling that theory would come out of practice rather than theory preceding practice. Carl identified the needs of his students for practical, real-world applications from which, he said, theory would come. His flexible style was yet another reason why Carl was a successful teacher. His individuation was developed to the point of using his non-preferred Sensor function well.
### Table 14

**Examples of Learning/Teaching Styles Data for Case Three**

<table>
<thead>
<tr>
<th>Carl's (ENTP) Learning Style Preferences (From Lawrence, 1993)</th>
<th>Example</th>
<th>Carl's (ENTP) Teaching Style Preferences (from Lawrence, 1993)</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prefer making impersonal judgments, aiming toward objective truth; staying free from emotional concerns while making decisions.</td>
<td>Was alert to student behavior but did not prejudge troubled students; volunteered to return to teaching from sick leave to help with study.</td>
<td>Role of the teacher is to encourage, inspire, help students develop as citizens and persons.</td>
<td>Held improved and responsible social behavior in his at-risk students as a priority; modeled appropriate behaviors, particularly how to deal with anger.</td>
</tr>
<tr>
<td>Prefers being caught up in inspiration; relying on insight more than careful observation; focusing on general concepts more than details and practical matters.</td>
<td>Was atypical as a teacher, looking for theory to come from practice; was typical in personal life in being interested in the new, particularly with his personal reading.</td>
<td>Ideas for teaching come from concepts from subject area, knowledge of students' needs and development, synthesis of ideas from many sources.</td>
<td>Used prepared worksheets from curriculum but also used many real-life examples for teaching.</td>
</tr>
<tr>
<td>Prefer a genuine choice in assignments, as with a system of individual contracts in which the student can negotiate some of the activities; prefer opportunities for self-instruction.</td>
<td>Sought and found teacher licensing program that would allow him to use his prior knowledge and experience.</td>
<td>Typical method of teaching is described as having a flexible daily routine that depends on topics and student need.</td>
<td>Used individual contracts with students and worked one-on-one with them; taught directly when concepts would help all learners.</td>
</tr>
<tr>
<td>Prefer feedback that shows them their specific, objective achievements.</td>
<td>Was not concerned with being evaluated in the military nor in student teaching because he knew the specific goals.</td>
<td>Students' work is evaluated by using a number of factors.</td>
<td>Used varied methods of evaluation including attendance, cooperation and completion of learning contracts.</td>
</tr>
<tr>
<td>Feel successful if they find their own ways to solve problems; prefer their work to feel like play.</td>
<td>Enjoyed planning while in the military; looked for unique ways to appeal to student interests.</td>
<td>The teacher feels successful if students have increased involvement with learning.</td>
<td>Was always gratified when students attended class long enough to achieve and when their behavior improved.</td>
</tr>
</tbody>
</table>

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CHAPTER 7

Doris and the Open Door

Doris is a math teacher at Devon, a middle school in the northeast quadrant of the city. Devon is the oldest site in this study, having been open for fifteen years. The student population totals 1,390 students in the sixth, seventh and eighth grades. It is located in a lower socioeconomic area, a mixture of industrial properties, mini-malls, trailer parks, apartments, and single homes. The area is ethnically diverse with the groups being African Americans, Caucasians and Hispanics, in roughly equal numbers. According to Doris, parents of children in the school are employed predominantly in the hotel service industry and in construction.

The school is a cluster of round buildings with the office at the core. Rooms can be entered from the central corridor or from the outside of the building from the grassy areas that surround the school. Older shade trees are clustered at various sections of the property. As with all of the schools in the study, adult hall monitors carrying two-way radios walk the halls and the outside of the school property. A police officer is permanently assigned to Devon, and the police vehicle is parked at the front entrance. Doris' classroom is in one of the round buildings at the eastern extreme of the facility. There are two
entrances to her room. One is the interior door that opens to the hallway, and the other is the external door that opens to a grassy area facing a public street. Typically, doors are not opened for students until 7:45 a.m., fifteen minutes before classes begin.

**Participant Description**

Doris is in her early forties. Her straight dark hair bespeaks her Cherokee heritage, while her fair skin and light brown eyes acknowledge her English and Scandinavian ancestors. Doris was concluding her second year of teaching when we met. Her undergraduate degree is in math as is her teaching license. She is working on a Masters degree in Math Education. She is the same age as Barb, the Case Study Two participant, but had come to teaching when her children were adults. Doris was responsible for teaching sixth grade developmental math and eighth grade accelerated math.

Devon had gone to a year-around schedule the previous fall. Mr. Delgado, the principal and Doris' supervisor, said “we're still getting adjusted to it – teachers and students.” Doris noted that it was difficult not to be off for a protracted length of time during the summer and during the winter holidays. She mentioned that her “patience was being stretched right to the session break.”

Although Doris was a high-energy teacher, moving about the classroom constantly, she confided that her energy ended when she got home. Not able to exercise regularly because of health problems, she spent most of each evening lying on the couch correcting papers and doing lesson planning. Despite her
physical constraints, Doris arrived at her classroom to do her planning an hour and a half before school started. She usually opened her external door a full hour before classes. Doris' open-door policy was well known to students who congregated in the classroom to play chess and checkers on boards she had set up and to play computer games or review math work on computers. These students were not only her class students but others who had arrived early and had nowhere else to go. Hers was one of the few open doors I saw that early in the morning. She talked about why she was there so early:

I also realize that these kids don't have things they can count on so what I try to do is be there for them as a person that they can count on. I'm there every day. I open my door. They can come to me every day. I'm something they can count on. And I think that's more important than whether or not they do the odds one day and the evens another day, or whatever ...

**Personality Type**

Doris had agreed to complete the Myers-Briggs Type Indicator (MBTI) during our first phone conversation. When I received the completed instrument, I found she was an Introverted, Sensor, Feeler, Judger (ISFJ). Though her Feeler score was 8, not a strong preference according to Myers and McCaulley (1985), her SF scores were higher than the other SF candidate. She agreed enthusiastically to participate in the study. Doris agreed with Myers and Myers' (1993) description of her personality type found on the Form G Self-Scorable instrument that she completed. Table 3 provides a synopsis of characteristics.
### Table 3

#### Quadrant View of Personality Types as Identified by the Myers-Briggs Type Indicator

<table>
<thead>
<tr>
<th></th>
<th>Case One: Art</th>
<th>Case Three: Doris</th>
<th>Case Two: Barb</th>
<th>Case Four: Carl</th>
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<tbody>
<tr>
<td>ST</td>
<td>SENSING + THINKING</td>
<td>SF SENSING + FEELING</td>
<td>NF INTUITION + FEELING</td>
<td>NT INTUITION + THINKING</td>
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<tr>
<td>Focus on:</td>
<td>Facts</td>
<td>Facts</td>
<td>Possibilities</td>
<td>Possibilities</td>
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<td>Handle these with:</td>
<td>Impersonal analysis</td>
<td>Personal warmth</td>
<td>Personal warmth</td>
<td>Impersonal analysis</td>
</tr>
<tr>
<td>Thus tend to become:</td>
<td>Practical and matter-of-fact</td>
<td>Sympathetic and friendly</td>
<td>Enthusiastic and insightful</td>
<td>Logical and ingenious</td>
</tr>
<tr>
<td>Find scope for their abilities in:</td>
<td>Technical skills with facts and objects</td>
<td>Practical help and services for people</td>
<td>Understanding &amp; communicating with people</td>
<td>Theoretical technical developments</td>
</tr>
</tbody>
</table>

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attributed to Sensor Feelers. In the margin she wrote, “Yes, this is me.” Briggs and Myers (1993) wrote that ISFJs are:

Quiet, friendly, responsible, and conscientious. Work devotedly to meet their obligations. Lend stability to any project or group. Their interests are usually not technical. Can be patient with necessary details. Loyal, considerate, perceptive, concerned with how other people feel (p. 2)

Mr. Delgado, her principal and supervisor described Doris in similar terms:

She has a tremendous knowledge of the subject matter. She’s an expert at the subject matter. But she uses that, as well as a warm, caring, kind personality that she has. She meshes it to become, probably the most outstanding teacher that I have on my staff. You see you can have a person that knows her subject matter and is very cold an not very kind and caring and it doesn’t work. But when you have both, you know, it’s great.

Lend Stability to Any Project or Group

Doris had become a resource for other teachers, an ISFJ-like characteristic as described by Myers and McCaulley (1985). She thought the reason for this was that other teachers perceived her to be an innovator. Both younger and older, less or more experienced teachers seemed to defer to her. Talking about peer cooperation, she said:

I have offered to give inservices or do whatever. You know I’ll go through the building and say, ‘Hey you guys. You want to borrow this or do that?’ And they’re looking at me. ‘What is that?’ There’s one other teacher here that … she teaches Algebra class and she’s really up on all the new stuff. She’s new like I am. You know you get teachers who have been teaching for twenty or twenty-five years … they’re doing what they’re doing. All of them here are really interested in the kids. That’s one thing that keeps me here. The math department teachers are really interested in the kids and they want to do what’s right for the kids, but some just don’t have the energy to do it any more.
Prefer the Practical and Organized When Young

Kroeger and Thuesen (1988) wrote that “because duty, obedience, and responsibility permeate all that the ISFJ does, the entire living style is marked by caring and concern for others, expressed in an orderly, well-regulated way” (p. 220). They also wrote that in later years ISFJs:

allow some relaxing of the schedule and more extroverted expressions of the self’s needs. Though such expressions are still tempered by a larger sense of social responsibility, this is still a refreshingly liberating opportunity for the ISFJ to pursue his or her own needs with a bit more zeal (p. 222).

Though Doris was not quite in her middle years, she was already manifesting a difference in personality type from the typical ISFJ. She spoke about her need for variety and innovation:

I am consistent in the way I manage a class but I am flexible, like in the assignment, and some times I’ll let them choose whether to do the odds or the evens [in the textbook]. You know if that confuses them, then I regret that but I ... it’s my personality. It’s hard to change that. You know I need to do that. And I need to get feedback. I’m constantly adjusting my life, whether it’s personal or whether it’s professional, based on what happens to me. So that’s just the way I am.

Doris' sense of social responsibility was also strong. In talking about her expectations when she began teaching, Doris said:

...it's like I had these expectations that weren't realistic. And then I would go home every day feeling defeated. You know that's not going to work. By the other token, I don't want to get like a lot of other teachers I see which have given up on kids and see it as a job. And it's not a job. It's a mission to me. It's what I'm doing with my life that makes my life worthwhile.
Doris spoke a number of times about not wanting to be a teacher originally. She said that teaching was the "farthest thing from my mind." During a two-year period when she was house-bound because of health problems, she "did a great deal of reflecting ... maybe too much." The result of that two-year period of her recovery was the strong desire to "do something for others ... to make her time count." She said "the time we have ... we have to do something with it. Every day I say 'this is good.'" Those reflections ultimately led her to teaching. Of Doris' personality type, Hirsh and Kummerow (1989) wrote that "ISFJs prefer an occupational setting that is attentive to both peoples' needs and to getting the job done" (p. 126).

The CAPT data bank figures for ISFJs include significant numbers for middle school math teachers (Myers & McCaulley, 1985) (see Table 15).

<table>
<thead>
<tr>
<th>CAREER CHOICE</th>
<th>ISFJ % of Total</th>
<th>SF % of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>teaching at all levels</td>
<td>11.10%</td>
<td>27.04%</td>
</tr>
<tr>
<td>middle/junior high teaching</td>
<td>12.23%</td>
<td>30.76%</td>
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<tr>
<td>mathematics teaching</td>
<td>12.68%</td>
<td>28.17%</td>
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<tr>
<td>real estate</td>
<td>7.23%</td>
<td>26.51%</td>
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<tr>
<td>accounting</td>
<td>9.84%</td>
<td>22.95%</td>
</tr>
</tbody>
</table>

Teaching N=16,678; real estate N=166; accounting N=427

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The figures for the SF quadrant were strong in both Doris’ teaching field and her prior careers. Sensor Feelers had a significant incidence of teachers among their ranks, 27.04%, with 30.76% selecting middle or junior high teaching, and 28.17% selecting mathematics as their subject area. Sensor Feelers were also well represented in Doris’ two prior careers, real estate and accounting. SFs selected real estate at 26.51%, and accounting at 22.95%. For the specific personality type, ISFJ, the numbers were also notable. ISFJs selected teaching at 11.10%, middle/junior high at 12.12%, and mathematics at 12.68%. Prior career numbers were lower with 7.23% selecting real estate and 9.84% selecting accounting.

As a point of comparison, Introverted Sensor Feeler Perceiver (ISFP) numbers were quite a bit lower. Only 3.2% selected teaching, 3.19% at the middle/junior high school level and 4.23% selected mathematics. Real estate was selected by 4.22% and accounting by 3.98%. It would appear that the functions — Sensor and Feeler — were the strongest indicator of someone selecting middle school math teaching as a career. SF functions were also equally strong in the selection of real estate or accounting.

Asked about her prior career, Doris explained that she and her former husband:

…owned a real estate company. I was a real estate sales person for another person and we went out and started our own brokerage. We had
a Coldwell Banker office for five years. I did that basically for about ten to twelve years, real estate.

Doris returned to school as an adult to complete her undergraduate degree and took classes with her daughter after her two-year break in careers. She talked about her decision to change from mathematics to math education. "I knew I wanted to do something with mathematics. And that I didn't want to do real estate any more. ... and I went to a counselor at [her local university]." After going through several career planning exercises with the counselor, Doris responded to the counselor's question of "If I could put you anywhere in the world, where would you be?" with "I'd be with kids and I'd be doing math." When the counselor suggested teaching as a career, Doris initially balked saying, "No way! No way! Teachers are underpaid and overworked. No way would I be a teacher." Yet she continued to think about it after she left the counselor's office:

And the more I thought about it, the more I thought, you know I really do want to be with kids and I want to do my math, so I think I could try both. So that's what I decided to do.

Asked if middle school had been her choice of levels to teach, Doris responded:

Yes, it was ... absolutely. I'm certified to teach through calculus because I was a math major. I'm like two courses away from getting my math degree [masters], so I have a real strong background in mathematics. And frankly, I'm questioning whether this is the right place for me because I don't get to do the math that I love to do. So I don't know. I may end up in high school. But I chose middle school because I know that's a really hard time for kids and I have an extraordinary amount of patience. I do [laughing]. I really do. And I think middle school kids need that.

Doris described her long-term professional goals to remain in her teaching profession but perhaps at a higher grade level:
Sometimes I see myself maybe teaching at a junior college or college level. That’s where people around me see me – in some kind of maybe teacher education thing or whatever. By that I mean my mother, my husband, my children all think that’s where I’m headed. I personally, my yearning is to be with kids. And so anything that would take me out of that direct relationship with kids is not in my psyche right now. But I’m working on my masters and I’ll probably go on and do my doctorate just because I’m crazy ... But right now I see myself teaching in the classroom ’til I drop over and they carry me out. But I don’t know. But I’ll keep on with my education because that’s the kind of person I am.

**Learning Style**

Doris’ learning preferences for the most part fit the descriptions of the Sensor Feeler in the literature. Lawrence (1993) described learning preferences associated with SF types as including “student-led demonstrations or presentations; instruction with personal involvement; television; films and audiovisuals” (p. 42). Identifying instruction that fits Sensors, Lawrence included “hands-on labs, computer-assisted instruction, teachers who show [students] exactly what is expected of them, and who do not move too quickly through material” (p. 44).

**Preference for Hands-On Materials**

Doris talked about her love of learning new things related to her major interest, math:

I feel a real need in spite of the classes that I’m taking towards my masters, to go and take a pure mathematics class again because it’s been two years, three years, since I had a pure mathematics class and I just really dig that stuff. It’s crazy I know [laughing]. I love to close myself in a room and just work on a problem for hours and hours and hours.
Doris felt frustrated that she did not have enough computers in her classroom to use with the students on a regular basis. She felt strongly that learning to use technology provided a good set of skills for the hands-on world of work into which her students would enter. When asked what she would select for her classroom if she had unlimited resources, Doris answered:

Computers. I’m furious that I’m in a situation, because I’m a huge believer in technology, and one of the things I said last year was, ‘I will have …’ You haven’t seen me use them, but I have a good set of calculators because last year when I taught eighth grade, we got to trigonometric functions and the calculators wouldn’t do it. And I said, ‘You know I want a decent calculator.’ And last year I went to the Simms thing and we learned to use TR182s and all these fancy things and we have no computer to hook it up to.

**Prefer Instruction with Personal Involvement**

Lawrence (1993) wrote that Feelers do their best work with “teachers who have personal rapport with students; feedback that shows warm appreciation for the student and his or her effort, and gives corrective suggestions in that context; personalized assignments” (p. 45). Doris’ personal preference for a warm caring teacher was demonstrated in her own caring about her students:

I care tremendously about my students and like I lay awake all night thinking of things that I could do or say or be and sometimes that overwhelms me to the point where then I’m on edge and I’m not who I want to be with them. It’s finding a balance somewhere. It’s been difficult. It’s still difficult.

Doris noted that Mr. Delgado’s positive feedback about her teaching was important to her. “Mr. Delgado is incredibly supportive. I’m lucky," she said.
Preference for Innovation and Autonomy

Doris talked about her student teaching and how she had felt frustrated at not being able to use what she had learned in her education classes:

I had a very traditional teacher in a very traditional setting. You know, fourteen years and she's been doing the same thing. They're in the rows. It was kind of painful because I had a lot of different ideas about teaching and I didn't get to really do any of them because she wanted it run just exactly the way she did. But when I started teaching then I got to do what I wanted to do.

Doris talked about her personal need to continue learning and to use her new knowledge in the classroom. She said she preferred to just "jump in" and work through new material until she mastered it on her own. Although Doris fit Myers' (1993) description of the Sensors as learners who "enjoy applying what they have already learned" (p. 25), she was closer to the Intuitor description in many ways. "Intuitors," Myers wrote, "like to do things with an innovative bent," as opposed to Sensors who "like to do things with a practical bent" (p. 25). Also, Myers wrote that Sensors "like using experience and standard ways to solve problems (1993, p. 25)," while Intuitors "like solving new complex problems" (p. 25). In this characteristic, Doris again was more Intuitor than Sensor.

Teaching Style

I observed Doris for six class sessions over a four-week period. The classes were first period and second period sixth grade developmental math. I usually arrived some time before the first period in order to observe her interaction with the students.
Environment and Students

The first period class had 27 students. The demographic breakdown of the 15 boys and 12 girls was 16 Hispanics, seven Caucasians, and four African Americans. The second period class of 23 students, 14 females and nine males, included nine Hispanics, eight Caucasians and six African Americans. Doris was not sure there was any systematic method of assigning students to group or levels since she had a wide range of abilities, as indicated by stanines and other school records, mixed in both groups. She felt there were one or two students who were clearly accelerated in achievement but there were no accelerated classes for sixth graders at Devon.

Her classroom was decorated with motivational posters, student work and a chalkboard with the week's work and student birthdays for the week written on it. Also included on the chalkboard was a teaser question concerning the content to be covered for the day. In the crowded classroom, every inch of space was taken up with multimedia aimed at stimulating student interest.

Doris talked about the problems her students lived with and how it affected the classroom and her:

I think the kinds of kids that we deal with here ... their families are so different from what I'm used to ... It's like I have not been exposed to this kind of environment where kids have so much on their mind and so much to deal with in their lives. I mean school seems kind of irrelevant to a lot of them. They're very physical. They're very quick-tempered. I don't remember ... my children never got in a fist fight. And these kids are all the time up in each other's face. I mean that's the first thing they think of. So that for me, last year, my first year was really difficult. You know one minute they'd be sitting there talking and the next minute they're up killing...
each other. And I had a student attack me last year and they took him out in handcuffs. I've never been exposed to anything like that.

Table 16
Checklist Summary of Case Four Instructional Strategies and Media

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* N= 329 Total number of instructional strategy and media use incidences tallied

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Data Collection Instruments

Prior to observing Doris, I showed her the checklist I would be using (see Appendix B). During the first observation I added several items: calculator, manipulatives, and worksheets. The strategies and media observed were then tallied (see Table 16). Post-observation interviews were quite brief because of the short time between periods. Doris tended to talk about what had happened on previous days in the class and those were the strategies and media we discussed.

One of the observations of Doris was videotaped, tallied separately and used for a stimulated recall interview. The tape was then viewed and tallied by a colleague for purposes of triangulation.

The observations included data from Gagné and Briggs' (1974) Nine instructional Events: 1) Gain Attention; 2) State Objective; 3) Prerequisites; 4) Prestimulus; 5) Provide Guidance; 6) Elicit Performance; 7) Feedback; 8) Assess; 9) Enhance Retention and Transfer. The data is organized according to these events, highlighting the instructional strategies and media used during each event. Lectures for this participant were mainly two to three minutes of explanations, rather than long sessions of oral narratives.

Gaining Attention

For this first instructional event, Doris used announcements eight times, directions twice, and began by turning on the overhead projector and waiting for
silence twice. The announcements tended to be for classroom management, predominantly directed toward the boys in the class.

**Stating Objectives**

In this lesson segment, Doris used announcements six times, directions ten times and, a lecture-demonstration twice, once using the chalkboard and once using the overhead projector. Twice she held up manipulatives demonstrating how the class would use them and once did the same with the calculator. Objectives for each day were also written on the chalkboard along with the lesson's activities, the week's birthdays, and homework assignments.

**Prerequisites**

Prerequisites were covered with directions, teacher-led discussion and a demonstration, each once. Doris also used lectures twice, supported by work at the chalkboard, and a lecture-demonstration using the overhead once. During this instructional segment, Doris used question-and-answer strategies eight times.

**Prestimulus**

This instructional event was generally homework correction. The predominant strategy was question and answer with Doris eliciting homework solutions from the students as she used overhead projections of the assignments. During this event, Doris also used directions twice, discussion once, demonstrations twice and lecture-demonstrations combined with
chalkboard and overheads 17 times. She demonstrated with manipulatives three times and the calculator once, using an acetate calculator on the overhead.

**Providing Guidance**

This was the instructional event during which Doris presented the major activities of the day. There was usually more than one activity so some instructional events occurred more than once during a class. Doris relied heavily on lecture demonstrations on chalkboard and overhead and on question and answer segments to engage students in this activity. Although she felt that students worked better as a result of small group activity rather than by listening to lectures, she said:

> I like group work. I really do. You know, I'm not most comfortable like a lot of math teachers standing up there talking to the kids. I would rather have them figure stuff out and find stuff out for themselves. But I'll tell you what; with these kids it's very difficult. It is very, very difficult to have them work in groups and to give them an investigation because they don't have any sense of that. They don't know how to cooperate and they don't know how to start from here and move on. And so, it's been just like little baby steps. It's like I can let them do such a limited thing.

During post-observation interviews, Doris talked about her real-time reflection that goes on during this segment of instruction. She noted that she often sees how an activity is going and adjusts it accordingly if students are having a difficult time. She then uses that information for the next class, again reflecting and adjusting the content and the strategies she uses to provide guidance. This real-time reflection, assessing and revising strategies based on prior experiences as she is teaching, is characteristic of Doris' teaching.
Eliciting Performance

During this instructional event, Doris used a one-on-one strategy 35 times, usually grouping her students in small groups (six times). She walked around the room checking each student's work individually, then checked for group cooperation. Asked what grouping patterns she preferred in a classroom, Doris answered:

Having three kids [laughs], I guess I'm at my best when I'm working one-on-one with a kid. I tutored last year. I love that. I just totally feed off of that, off that interaction. The last thing I want to do is stand up there. I don't get ... I don't see the light bulb go off when I'm standing up in front of the room the way I do when I'm working with a kid and I see him doing something and I just really get excited. It's for my need more than theirs.

Doris also used lecture-demonstrations with chalkboard 29 times and questions and answers 22 times. Students used manipulatives four times, paper and pencil (worksheets) four times and the calculator once. One of Doris' lecture demonstrations modeled calculating mentally, a skill she thought important.

There's no answers there [on the overhead]. I told the kids there's no answers. I don't have them. I do it in my head at the time so I show them that's possible. Every day I do that. Every day. You can do it. It just takes practice, that's all. That's how I try to model for them.

Doris noted that one of the departmental goals is to get students to learn to calculate in their heads. She said it is a difficult goal because "there's a bunch of kids who you just say 'you can't touch your pencil and they go bananas on me because they have to use their fingers or draw little marks, particularly in that class [second period developmental math]." I asked Doris if she thought part of their difficulty with mental calculations might be that some students were
kinesthetic learners and needed manual contact to calculate problems. She responded:

I think a lot of it is because the kids in that class, their stanines are one and two. And they are so unsure of themselves, if you take any kind of tool away from them ... sometimes I'll say 'hold your pencil' or I'll just stand there and hold their hand. They just need that extra assurance that they can do it. So I try not to ever say 'You know you must do it this way, or whatever.' So sometimes I'll let them take their calculators — even though I know their calculators are no use whatsoever in the problem that they're doing, but they just ... they want them. It just makes them feel better. It would be like [if I said], 'You can't use your finger,' they would probably just freeze up and not be able to do anything.

Feedback

Most of Doris' feedback relating to class work tended to be brief affirmative comments. These included: "OK." "Right." "You're close." "You tried hard, but that's not what they want in the book." However, the bulk of Doris' feedback comments were directed toward classroom management. They were corrective and were directed predominantly at boys in both classes. Examples included: "Where's your paper. Are you awake? What a terrible surprise to wake up and find you're in school." "I'm speaking to Chuck. Don't yell at me like that." "Hello. This is Chapter 9 and your name is?" "What did she say. I can hardly hear her with all the noise going on." "Try to keep your mouth closed. I used to have that problem as a child."

I observed several examples of the girls in the class managing cooperation within their own groups. One girl addressed another who was not cooperating in the small-group activity with: "Girl, just move and stop making
trouble." I also noted two girls who were consistently off-task but who were not causing verbal disruption. Doris either didn’t see them or chose to focus on other students who were causing disruption. I asked Doris about the two girls who were off-task during the post-observation interview. Doris told me they had stanines of 7 or 8, didn’t really belong in the class, and came from homes with major problems. She added:

There are several like that. All these kids I worry about. There isn’t one of them I don’t worry about. All these kids … they have such horrible lives at home. Even the most normal-seeming ones. You find out all kinds of stuff.

Assessment

This instructional event usually took two forms: question and answer segments (four times) and worksheets (four times). Doris noted that she gave the regularly scheduled departmental math tests, but I was never in class when that occurred. Students were evaluated by a number of factors including homework completion and accuracy, classroom work, cooperation, testing and extra credit.

Mr. Delgado talked about the affective part of assessment that was his focus, a focus supported by Doris’ words and classroom behavior.

Test scores aren’t everything. I mean the legislature, my boss, you know it’s very important for them to have test scores, but we want a safe school. And we want to teach our kids some character values that will be very important for them when they go on to high school [and] eventually go to the work force. Of course we want to teach subject matter, and we want to make sure that we’re teaching every thing that we want to teach but we really feel that we’re good at giving them those character values that they need.
Retention and Transfer

Doris' main strategy for reinforcing retention and transfer was games, usually done on worksheets, but also including electronic games available for students on the two classroom computers. She also employed lecture with overhead once and a question and answer session once.

Triangulation

In addition to observation and interviews, I used peer observations of videotapes and member checking, participant reading of the manuscript, for triangulation. With the exception of the one-on-one strategy, both videotape tallies were close. The discrepancy came from the peer tallying segments of similar actions being repeated and my tallying individual actions. After Doris read the manuscript of her case study, she and I met to discuss it. With the exception of some typographical errors and clarifications of some of her direct quotes, she totally agreed with the narrative. She added more information on her reasons for teaching, information that has been included in this case study.

Other Factors Influencing Teaching

Other factors that influenced Doris' teaching, in addition to her personality type, were education, school administration, resource accessibility, prior experience and beliefs. These were all present in varying degrees.

Influence of Education

Doris remembered well the influence of her student teaching and her education courses. As noted before, she felt frustrated because her supervising
teacher was traditional and would not let her try her innovative ideas. Her teacher educators, on the other hand, modeled for Doris what she thought was best in teaching. They included professors who taught math methods, general methods and science methods.

Those classes modeled for me the experiences I try to give my kids now. They modeled group work. They modeled many different teaching strategies so not only did we read about them but we did them. I remember we had to teach using different strategies and we taught the strategies so that was kind of an interesting experience. In Dr. ___'s class we had to read case studies and then we did a lot of reflecting. And I can remember some case studies now and having situations pop up that are almost identical to them.

Influence of Administration

When asked if there were any teaching strategies or media that her school was emphasizing, Doris responded:

No, in fact, that's really been ... we had an inservice where we learned about learning styles which I had already been exposed to several times and they encouraged us to use as many strategies as possible. And she did present several things which I was already aware of so it was like a review. I don't know how useful that was to a lot of the other teachers. They just sort of said, 'Oh, that's nice,' and went back to doing what they do. It reinforced for me and I also took the learning styles [instrument]. We gave them to the kids and I spent a day going over those with the kids. And I know I'm the only teacher in the whole building that's done that.

Mr. Delgado, Doris' supervisor, talked about what the school system and the school were emphasizing:

We have certain elements of quality ... that we evaluate teachers on. Basically it concerns using assessment scores, how they assess students; whether there's mutual respect in the classroom; whether the students relate well with the teacher; whether there's kind, caring, nurturing things going on in the classroom; and whether they use services
of the counselor and the dean; again, classroom management, whether their classroom is alive with learning, looks good – posters up on the walls – and then the last, but not the least, how they teach. Do you have a good opening lesson? Do they teach what they’re supposed to teach according to the syllabus? Are their lesson plans reflective of what they teach in the classroom? You know, everything that would go on in the lesson.

Mr. Delgado also explained that Devon did not completely follow the middle school model (Carnegie Council on Adolescent Development, 1989) since they did not have a common prep time for teachers “because we are so small.” They did, however, have natural teams with the tracks because they were a year-around school.

Mr. Delgado also noted that the school was emphasizing math computation at present.

You know, our test scores were low in math computation, therefore we’re emphasizing that... I think our test scores came down a little bit because we did transition from traditional nine month to year-around. We were concerned about various things that didn’t have anything to do with the testing situation and administering the test, and I don’t think our focus was really good as far as administering the test.

Doris had mentioned to me that the first few minutes of each class were supposed to be devoted to doing basic math computations in support of improving the students’ skills in that area.

**Availability of Resources**

Both Doris and Mr. Delgado lamented the lack of computers for the students. Asked what he would buy for the school if he had sufficient resources, Mr. Delgado replied:
I'd have three computer labs. I'd have three Mac computer labs with the finest software in every subject matter that I could get. I would have a parent-link program which is a program where you can do callout. I'd have it structured so that I knew who all the Hispanic parents were so that I could call them with messages every once in a while ... what's going on in the school. Then I'd have English messages with what's going on in the school too.

Several times Doris noted her desire for computers in the classroom. Six months after my observations concluded, I saw Doris. The first thing she said to me after we had greeted each other was, "I managed to scrounge three old computers for my classroom." The fact that all had different platforms and she didn't have sufficient software for the computers did not daunt her. She felt it was a "real beginning."

Another resource that Doris felt strongly about was peer interaction. She said, "One of the things that we've been talking to Mr. Delgado about is that we need more time together. We need time together and we need input." She added:

I'm on the learning team here and we had an all-day thing which we were doing trying to figure out how we're going to improve the kids' test scores. We need more of it even if it's ten or fifteen minutes that we get together and say, 'Hey, this is a cool idea I saw and here's how to do it', or whatever.

Influence of Prior Experience

Doris did not feel that her previous skills used in real estate were being used particularly in the classroom. She did say that she had used her math skills in real estate and in accounting but that she had not gotten her degree in math
until she had left real estate. She noted that her ongoing use of math in her prior career had reinforced the idea that she wanted to continue working in math.

**Influence of Beliefs**

Doris believed strongly that her being in the classroom could make a difference in her students’ lives.

... pretty quick I figured out that what I’m doing here is making a difference in these kids’ lives from a lot of different aspects and maybe a small part of it is mathematics. And I can changes their lives, if they’ll let me, not only by being present to them in a lot of ways, but also through mathematics and through their education, if they can see that. But the hardest thing for me has been to realize that there are some kids that will not grab on to that. And there’s not much I can do about it. I’ve got to let go of it or it will drive me crazy.

Doris noted how reality had set in for her in terms of student motivation.

I guess I thought they were like my kids and they wanted to learn. I guess I thought they just needed somebody who loved them and cared about them and wanted to teach them and was willing to give it their all and that, you know, that would be enough. And I’m learning that’s not always true. You know, that there’s a lot of other things that impact on kids that I was not ... that I was aware of but it was not in my immediate consciousness. And, you know, that I’m not all-powerful and all-knowing and can’t do these things to make their lives better.

Doris also talked about her belief that students would benefit from being in the classroom in ways other than learning math skills.

See, I believe that even if they don’t learn what they’re supposed to learn, that even if they only learn how to cooperate and learn from each other, that that’s a tool that these kids aren’t getting. And that that in and of itself is worthwhile and I really believe that. I’m one of maybe two or three teachers in this whole school that even tries to put their kids in groups.
Case Three Summary

Figure 8 displays the summary of instructional strategies and media used by Doris. The major strategy Doris used was short lectures/explanations delivered with the aid of chalkboard and overheads. This was followed in

![Graph showing incidences of use for various instructional strategies and media.]

Case Four-SF

Figure 7. Case Four Summary

frequency by one-on-one work with students that occurred 44 times. Doris asked 70 questions in seven of nine instructional events, gave directions 29 times, and used announcements 16 times.
Discussion

Myers and McCaulley (1985) identified type differences in teaching styles. For the Sensor Feeler, they detail six characteristics, some of which were consistent with Doris' teaching styles, others which were not.

Role of the Teacher

On a number of occasions, Doris talked about the importance of remaining with these students who needed her. She felt it important to build their self-esteem and to give them skills that would serve them in the work world. Her emphasis on encouraging cooperative activities in the classroom was an indication of the value she placed on being able to work together toward a goal. Her assignment of a daily greeter to sit by the door and open the door for visitors as well as to deliver messages to the office was another example of her building responsibility in her students. These teaching behaviors were congruent with Myers and McCaulley's (1985) description of the SF as believing that "the role of the teacher is to instruct, discipline, encourage, support, role model, and serve others" (p. 135).

Despite some previous problems with violence in the classroom, Doris demonstrated trust in her students on an ongoing basis. During a lesson, Doris had a student distribute scissors to all the class members. She told me after class that she had gotten the "pointy" scissors from the head of the math department who asked, "Who are you going to use them with?" Doris responded, "My sixth graders." She also related that she had told the students,
"If I see anyone poking or stabbing someone, you're gone and the scissors are gone." To date, Doris has not had any problems with the scissors.

**Curriculum Planning**

Doris often tried activities she had learned the night before in her university classes. After she had used a birthday calculation activity, I asked her if she did that type of non-textbook activity often. She replied:

Anywhere I can get them. Any time I go to like the ACTM thing or whatever, I have all kinds of neat things. And like any time I see something neat, I want to do it within a day or two. Because if you put it in a file somewhere, you tend to have a file with neat things and not do it.

Doris' curriculum planning fit Myers and McCaulley's (1985) description of the SF teacher whose "Ideas for teaching come from curriculum guides, manuals, textbooks, workshops, other teachers, and experience" (p. 135).

**Lesson Planning**

Explaining her lesson planning, Doris again cited her attraction to innovation:

It doesn't matter [if it's in the lesson plans] because it's good practice for basic skills. And even though maybe it didn't exactly fit in with what I was doing ... you know by your second year ... I found out that it's not so important that on day one [I do] page 334 and on day two I do page 335. If I want to stick in something in there then I do it. So you know, I do that, plus it helps break things up.

Myers and McCaulley (1985) wrote that for the SF teacher, "Teaching is planned by establishing complete objectives and detailed teaching plans using yearly school calendar; taking students' abilities into consideration" (p. 135). Again, Doris' attraction to innovation was more an example of the NF teacher than the
SF. She planned her lessons in great detail, then changed them when she was introduced to some new strategy at a workshop or in her graduate classes.

**Teaching**

Doris was somewhat atypical for her teaching style as documented in the literature. Her focus was on adjusting her lessons to student needs and to her need for variety. Myers and McCaulley (1985) wrote that for the SF teacher, the "Typical method of teaching is described as following ordered daily pattern adjusted for person-centered interactions" (p. 135). Doris related that a lot of teachers told her that introducing variety was the 'wrong thing to do ... that those kids need the same thing day in and day out. That their lives are too unstructured." She said she saw their point and it was a point well taken, but:

I like structure ... don't get me wrong ... I do. But I also get bored by too much structure, so I have to like do something different. I don't do the same thing all day. I, generally speaking, after I've had time at lunch to think about it, fifth hour will be totally different than second or third. And I generally change things depending on the class or depending on my mood or you know, do the same thing.

In that same conversation, Doris related what was probably the reason for her changing strategies – reflection. She talked about teaching the same subject matter all day, except for her fourth period accelerated eighth grade class.

That's a total switch-over. But that comes after lunch and I don't go to lunch. I sit in my room usually and I get things ready and I get myself ready and I think, 'OK.' And at the same time I reflect and say – and you know I'll say it to the kids – 'You know, I tried this in first period and this didn't work too well so let's do it this way.' Or like I'm by third period – first and second didn't get what I did here at all so maybe we can find some other way to do it or let's do less homework, or let's do more. And I watch the clock. And like if I had 20 minutes left, I assign things differently ... so
lots of times kids will say, 'How come they got that assignment or how come they got that assignment?'

In adjusting her lessons for person-centered interactions, Doris was demonstrating characteristics of the SF teacher as described by Myers and McCaulley. During the course of the interviews, I noted three different types of reflection that Doris used. Louden (1991) described two of them as preactive and postactive. The third that I identified as real-time reflection occurred when Doris adjusted her teaching moment by moment depending on how students were responding to her strategies. The quote above is an example of all three types of reflection that Doris used.

**Evaluation/Assessment**

Homework completion, including timeliness and accuracy, was a big part of Doris' assessment process. That, as well as in-class work, cooperation, test grades, and extra-credit work, constituted her criteria for grades. In describing the SF's teacher's preferences for evaluation and assessment, Myers and McCaulley (1985) wrote that "Student's work is evaluated by using points and percentages, plus extra credit options" (p. 136). Doris' evaluation and assessment was consistent with this description.

**Criteria for Success**

Myers and McCaulley (1985) wrote that "The [SF] teacher feels successful if student behavior and grades improve, and there is the feeling of having contributed to students' education" (p. 136). This description very much
reflected Doris' point of view. Numerous times Doris talked about how important it was for students to develop self-worth and to experience some success. This, along with teaching them skills to get along in the world were of paramount importance to her.

They've been beaten down, those kids, and you know, it's like they don't believe they can do it, especially the Hispanic kids. They have so little self-confidence. The parents have little self-confidence and they have little self-confidence. And I know that those kids, a lot of them, are able to do things. There's a lot of kids who aren't.

Doris talked about the gratification that came with watching the students develop self-worth and grow in the math skills as well as in their interpersonal skills. She said that many of her students had no concept of "civil behavior" nor of how to resolve conflict without violence. She felt successful when developed both content and interpersonal skills.

Conclusion

From the data collected, it would appear that Doris, the math teacher, was true to her personality type/learning style predominantly in the affective domain (see Table 17). The Feeler characteristics of being person-focused were strongly documented. These characteristics included her concern for the students' difficult lives, and their need for self-discipline and cooperation skills, as well as her preference for one-on-one work with students.

It did not appear that there were any major external constraints to Doris' selection of teaching strategies and media with the exception of lack of computer resources. Because of the characteristics of the students, many of whom could

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be considered at-risk, Doris spent a great deal of time focusing on classroom management and motivation, not her preference, but what she felt was necessary to create a learning environment in the classroom.

In a conversation sixth months after the study was completed, Doris talked about what her priorities were. She recalled Fuller's (1970) Stages of Concern that we had discussed early in the study. She felt she had reached Stage Three, Concern for Impact, rather quickly. She did not know if it was because of the stressful environment in which she worked or because she was a mature person when she entered teaching, but she felt her focus was most definitely on student achievement. She had quickly moved through Stage One, Concern for Self, and Stage Two, Concern for Task, in her constant efforts to help students with Impact, learning and retaining life skills and knowledge.

Doris' preference for innovation was uncharacteristic of Sensor Feelers, as described in the literature. One can only speculate whether this was driven by a constant need to find material that would touch her students, or whether it was a variation from personality type. Perhaps Doris had developed the Intuitor aspect of her personality already. Typically, Myers (1980) wrote, the development of the opposite occurs during and after mid-life in a person who is working consciously on personal development.

Another example of Doris manifesting her opposite --Intuitor-Thinker -- characteristics was her lack of sequencing of activities in her lessons. The Sensor, particularly the Sensor Thinker, prefers clearly sequenced activities.
found it interesting that all of the Sensors that I have worked with tended to be meticulous about numbering their work in sequence, either alpha or numeric, no matter what the subject. Doris talked about never numbering her work. She said she had never thought of doing it for the students, but always did it "in her head." When we met later in the year, she told me she had decided to start numbering activities and plans for the day's lessons, posting them in visible areas in the room. She thought it might help students who preferred that structure.

Other aspects of Doris' teaching, however, did reflect the literature of ISFs. Her high need for structure in her planning and in her teaching, her focus on students' feelings, and her leadership in the math department were all characteristic of SFs.

Of the four case participants, Doris' was the most atypical. She did, however, fit some of Lawrence's (1993) descriptors of SF mental priorities, including:

working in harmonious, familiar, predictable situations; attending to the tangible needs of individuals; making a distinctly personal physical environment in which to live and work; being in situations where their keen attention to the here and now is useful and appreciated (p. 193).

Doris fit Lawrence's (1993) descriptors of her opposite, the NT, in several areas, including:

... working on problems that respond to their own new techniques and solutions; having opportunities to independently produce innovative, ingenious solutions (p. 193).
Table 17
Examples of Learning/Teaching Styles Data from Case Four

<table>
<thead>
<tr>
<th>Doris' (ISFJ) Learning Style Preferences (from Lawrence, 1993)</th>
<th>Doris' (ISFJ) Teaching Style Preferences (from Lawrence, 1993)</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attends to relationships; personalizes issues and causes they care about; seek harmony in relationships; naturally appreciate people and their accomplishments.</td>
<td>The role of the teacher is to instruct, discipline, encourage, support, role model, and serve others.</td>
<td>Doris focused on helping her at-risk students become good citizens and acquire skills and knowledge to succeed in life.</td>
</tr>
<tr>
<td>Prefer skills and facts they can use in their present lives.</td>
<td>Ideas for teaching come from curriculum guides, manuals, textbooks, workshops, other teachers, and experience.</td>
<td>Frequently used materials from external sources for teaching, as well as using her planned lessons.</td>
</tr>
<tr>
<td>Believe the adult world has specific skills and knowledge they should be taught and are disappointed in any teacher who expects them to discover them for themselves.</td>
<td>Typical method of teaching is described as following ordered daily pattern depending on topic and student need.</td>
<td>Was atypical in that she used a great deal of innovation in her teaching; was typical in adjusting lessons to student needs based on reflection.</td>
</tr>
<tr>
<td>Prefer feedback that shows warm appreciation for the student and his or her effort, and gives corrective suggestions in that context.</td>
<td>Appreciated her supervisor's constant positive reinforcement; looked for opportunities to share with peers.</td>
<td>Students' work is evaluated using points and percentages, plus extra credit options.</td>
</tr>
<tr>
<td>Feels successful with milestones, completion points, with little ceremonies to honor successful completions.</td>
<td>Felt successful in having earned her license, in her progress toward a masters degree, and in staying in teaching.</td>
<td>Used feedback extensively to provide positive reinforcement to students; was typical of SF type in evaluation methods.</td>
</tr>
</tbody>
</table>

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CHAPTER 8

DISCUSSION OF FINDINGS AND RECOMMENDATIONS

Part One: Introduction

This chapter is presented in three parts. Part One, the Introduction, describes the context of the study. Part Two presents a discussion of the findings of the study. Findings are compared across cases and compared to prior research on learning styles and teaching styles. Part Three presents the recommendations resulting from the study. These include recommendations for further research and recommendations for practice.

This study examined the influence of non-traditional teachers' personal learning styles on their teaching styles with the intent of adding to the literature of non-traditional teachers and making recommendations for practice. The researcher identified the personality type and learning styles of four non-traditional, career change teachers, using the Myers-Briggs Type Indicator (MBTI), and then explored the impact of their learning styles on their teaching, as demonstrated by their selection of instructional strategies and media. The study used Keefe and Ferrell's (1990) definition of learning styles as the "composite of characteristic cognitive, affective and psychological factors that serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment" (p. 59). Teaching styles were defined
as characteristics of the unique choices teachers make from the wide range of models that exist to shape curricula, design instructional materials, and to guide instruction in the classroom and other settings (Joyce, Weil & Showers, 1992).

To explore the four non-traditional teachers' personal learning styles and teaching styles, this study sought to answer two questions. The overarching question of the study was: 1. Do participants' selections of instructional strategies and media predominantly demonstrate their learning styles? In addition, a second question was asked: 2. What other factors, e.g., environmental, administrative, educational or experiential, influence the participants choices of instructional strategies and media?

Research Question One focused on the relationship between preferred learning styles and teaching styles of non-traditional teachers. Teachers' personality types were identified through administration of the Myers-Briggs Type Indicator (MBTI) Self-Scoring Form G. Their learning styles were then identified from research based on the MBTI and learning styles. Teaching styles were studied through: (a) interviews with the participants, before and after observations; (b) interviews with their immediate supervisors; (c) observations of the participants' teaching; and, (d) additional triangulation through the use of videotapes and through member checking, participants' reading of the results of the study for concurrence.

Research Question Two focused on other influences that might affect the participants' selection of instructional strategies and media. These influences
were Stages of Concern (Fuller, 1969), prior experience, administrative support, class and classroom size, and resource availability. Data were collected for this question through interviews and observation.

Part Two: Findings

Findings Related to Question One on The Relationship between Preferred Learning Styles and Teaching Styles of Non-Traditional Teachers

Personality Type

The four teachers concurred with the descriptions of their personality types as self-reported on the MBTI. Myers and McCaulley (1985, p. 58) indicated that moderate strength of preference would be any number on a preference greater than 10 (p. 58). The ranges identified by Myers and McCaulley were: Clear Preferences (21-39, or 29 for F); Moderate Preferences (11-19); Slight Preferences (1-9). The four participants and their numerical preferences are displayed below in Table 18.

Although the study design called for selecting participants with preference strengths over 10, Doris was one of only two volunteers who self-reported as Sensor Feelers. She had the stronger direction of preferences of the two volunteers. Her Feeler preference of 9 was within what Myers and McCaulley (1985) described as the slight preference range (1-9). They wrote:

Low scores are often associated with a sense of tension between the poles of the low preferences. (For example, low TF scores are often associated with reports of trouble in knowing whether “to follow my head or my heart” (p. 58).
Table 18

Participant Personality Types and Strength of Preferences

<table>
<thead>
<tr>
<th>Participant</th>
<th>Art</th>
<th>Barb</th>
<th>Carl</th>
<th>Doris</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personality Type</td>
<td>I S T P</td>
<td>E N F J</td>
<td>E N T P</td>
<td>I S F J</td>
</tr>
<tr>
<td>Strength of Preference</td>
<td>13 20 12 16</td>
<td>22 14 11 14</td>
<td>19 15 17 23</td>
<td>21 17 9 18</td>
</tr>
</tbody>
</table>

Learning Styles

The four teachers reflect the descriptions of their learning styles in the literature (Kroeger & Thuesen, 1988; Lawrence, 1993; Myers & McCaulley, 1985). They demonstrate their learning styles in the way they teach, that is, in the strategies and media they select to use in the classroom.

Art, a Sensor Thinker, has a strong preference for experiential learning and for real-world applications of classroom knowledge. Because experience is his learning style preference, he continues to work part-time as a professional musician. As a teacher, he plans numerous activities that will offer the band members opportunities to play in public. He also uses his prior experience as material for teaching points in the classroom. His way of learning is to do it first.
and then extrapolate the theory. He combines practice with some theory in the classroom, believing that both are critical to developing the students. He is comfortable with movement and some student noise in the classroom, expecting the students to be free to express themselves within the boundaries he has established in his classroom.

Barb, an Intuitor Feeler, prefers learning assignments that put students on their own initiative, a characteristic of the Intuitor. Insight, inspiration and opportunities to solve her own problems are preferences she transfers to her teaching. Her preference for opportunities to be inventive and original is shared with her students through the types of special projects she assigns to them. Her preference for learning through personal relationships is very much in evidence. In her classroom she learns all she can about her students in order to help them, and she works extensively one-on-one with them.

Carl's Intuitor Thinker preference for self-instruction plays out in his classroom in the form of individual contracts, his choice, not a school mandate. His preference for finding his own way through new material is offered to his students in the form of individual and small group work, with Carl always available to remove barriers to learning. Although his classes are very organized in terms of individual goals, he departs in one way from the typical learning preferences of Intuitors Thinkers – that of organized teacher lectures. He seldom lectures to the large group, using that strategy only when there is a concept to be reviewed from which most or all students will benefit.
As a learner, Doris prefers student-led demonstrations and presentations. In teaching, this Sensor Feeler preference takes the form of collaboration with students in reviewing homework and in the prestimulus part of presenting new concepts. Her preference for instruction with personal involvement is obvious in the classroom where she is available for long periods before and after school, and where she reminds students of her regular contact with their parents. Her preference for well-organized sensory-rich instruction is evident in her classroom with her use of such media as manipulatives, gaming, computers, and craft projects evolving from concepts being taught.

Doris differs from the descriptions of Sensor Feeler learners in her attraction to innovation and change. Though she strongly agreed with the results of the MBTI where she reported as a Sensor, in practice she demonstrated both the preference of the Intuitor for innovation and variety, and the Sensor preference for “starting with the concrete and moving to the abstract” (Lawrence, 1993, p. 44). She explains this dichotomy of preferences as “doing anything necessary to reach the kids.”

**Teaching Styles**

The descriptions of teaching styles were based on the four-quadrant view of the 16 personality types identified by the MBTI. The quadrants included: Sensor-Feeler (SF), Sensor-Thinker (ST), Intuitor-Feeler (NF), Intuitor-Thinker (NT).
The study used Thompson's (1984) paradigm of how: (a) teachers see their roles; (b) get their ideas for teaching; (c) plan their work; (d) teach their classes; (e) evaluate their students; and, (f) feel successful (cited in Myers and McCaulley, 1985, pp. 135-156). All five of Thompson's factors produced meaningful results when applied to the four teachers.

**Their roles.** The four teachers see their roles in a manner consistent with Thompson's description. Art, the Sensor Thinker, is quite focused on setting an example for students, being a role model, and sharing knowledge and experience, particularly from his prior career as a professional musician. Barb, the Intuitor Feeler, sees her role as encouraging, inspiring, providing variety and creativity, and motivating students to develop. Carl, the Intuitor Thinker, is focused on inspiring, encouraging and helping his at-risk students to develop as citizens and persons. Doris, the Sensor Feeler, sees her role as one of instructing, disciplining, encouraging, supporting, modeling positive roles for her at-risk students, and serving others.

*Ideas for teaching.* In terms of where they get their ideas for teaching, the differences among the four teachers are predominantly between the Sensors and Intuitors and are consistent with the results of Thompson's work. Art (ST) looks to state and local curriculum guides, textbooks, and experience for his ideas. Doris (SF) uses curriculum guides, manuals, textbooks, workshops, other teachers and experience. Barb (NF) draws concepts from content of the subject taught; courses, reading, knowledge of student development, and "ideas from
everywhere." Carl (NT) uses concepts from subject area, knowledge of students' needs and development, synthesis of ideas from several sources, many of which are from the world of work.

**Planning their work.** Each of the four teachers fits his/her quadrant description of work planning provided by Thompson, and each focuses on one aspect of several provided by Thompson for each quadrant. Art, the Sensor Thinker, makes "complete, detailed plans in advance for year and term with specific objectives" (p. 135). He adjusts according to the skill levels of each group, but he follows the sequence of the plan and works toward achieving his specific objectives. Barb, the Intuitor Feeler, structures "plans around general goals, themes, and students' needs; then [adapts] plans to students' needs week to week" (p. 135). Carl, the Intuitor Thinker, makes an individual plan for each student "according to an overall yearly structure; organizing by concepts or [real-world] themes; determining details by student levels" (p. 135). Doris, the Sensor Thinker, establishes "complete objectives and detailed teaching plans using [the] yearly school calendar [while] taking students' abilities into consideration" (p. 135).

**Evaluating student work.** Thompson (1984) described both the SF and the ST as evaluating student work by using points and percentages in a systematic way. He added that the SF also awards extra credit.

Both Doris (SF) and Art (ST) use points and percentages in a systematic way and Doris regularly provides opportunities for extra credit work. Barb (NF)
and Carl (NT) vary slightly from Thompson's description of the ways their types prefer to evaluate student work. Barb (NF) uses a number of factors, the key one of which is grades. Attendance and cooperation are part of her assessment strategy. Carl's primary focus is on attendance and then on completion of individual work contracts. Thompson described both types as "using a number of factors" and the NF having more factors in addition to grades.

**Criteria for feeling successful.** Thompson described the ST as feeling successful if student grades and behavior improve. Art (ST) indicates that he feels successful if students transfer the discipline and skills from their classes into their lives. Doris (SF) speaks frequently of feeling successful if there is "a feeling of having contributed to students' education" (Thompson, 1984, p. 136), as well as seeing their grades and behavior improve. Barb (NF) fits Thompson's description of the NF feeling successful if "student learning and participation increased and there is the feeling of having made a personal contribution to students' education." (p. 136). She speaks of the satisfaction of visiting with former students who describe how they use math in their work and in their daily lives. Carl (NT) goes beyond Thompson's description of the NT feeling successful if "students have increase involvement with learning" (p. 136). Carl feels successful if his at-risk students stay in class long enough to learn some useful skills for their adult life, and if they manage to develop interpersonal skills that will replace behaviors that have gotten them in trouble.
Strategies and media. All four participants teach quite differently even though three of four of the participants are teaching in the same subject area, Mathematics. Their environments include two middle schools, a traditional secondary school, and an alternative high school. All had taken some of their education coursework within an eight-year time span, at the same southwestern university, hence had been exposed to similar educational methods and some of the same faculty.

With the exception of directions and lecture-demonstrations, the teaching styles differ greatly and are consistent with descriptions of the quadrant preferences in the literature. The three mathematics teachers are most alike in their use of directions (10, 13, 19 incidences respectively), and lecture-demonstrations (20, 20, 21). With the remainder of strategies and media, there were large differences: feedback (9, 15, 20); lecture with overhead projector (0, 0, 26); question and answer segments (35, 32, 70). The fourth participant, the Sensor Thinker music teacher, also uses directions extensively (68).

Classroom management strategies of the participants are consistent with the literature. The Thinkers, Art and Carl, demonstrate characteristics cited by Myers and McCaulley (1985) of allowing “more individual activity in the classroom and [attempting] to control the resulting disorder with nonverbal negative behavior” (p. 135). Conversely, the Feeler participants, Barb and Doris give more “positive verbal and nonverbal feedback to students”, characteristics observed in Feeler teachers according to Myers and McCaulley (1985, p.135).
The Intuitors, Barb and Carl, are documented as having high use of one-on-one interaction with students while moving around the classroom, a characteristic noted by Myers and McCaulley (1985, p.135) as common in Intuitor teachers. Doris, the Sensor-Feeler teacher also has a high incidence of one-on-one interaction. The lowest incidence is Art, the Sensor-Thinker teacher.

The two Feeler teachers, Barb and Doris, have an open-door policy before class and greet students. This is consistent with the literature that describes Feelers as focusing first on personal aspects and then on the academic. One Thinker teacher, Carl, opens the door for class after all the students are lined up outside. The other Thinker teacher, Art, is busy in his office in the band room with administrative work up until the time for class to begin. He does, however, stop what he is doing when students came to his office with questions or greetings.

All four teachers establish caring in the classroom by learning as much as possible about the students. They make a point to learn and use student names early in the semester, explore student backgrounds when there are problems, and take the time to speak individually to students to anticipate and/or resolve academic and personal issues before they are magnified. This occurs despite the fact that each is teaching at least six classes a day and each is involved in a number of extracurricular activities.
Relationship to Previous Findings

The relationship between preferred learning styles and teaching styles does not appear to be stronger in the sensing function (S/N) than in the judging function (F/T) as Huelsman (1983) found. Her sample, however, included a dominance of elementary teachers who, according to the CAPT data bank, are predominantly Extroverted Sensor Feeler Judgers (ESFJs). Myers (1993) described the ESFJs as "practical, realistic, down to earth, decisive, thorough and consistent" (p. 22). The Sensing preference appears to be well developed in many elementary school teachers (Myers & McCaulley, 1985; Lawrence, 1993).

Findings Related to Question Two on the Influences That Might Affect the Participants' Selection of Instructional Strategies and Meida Stages of Concern

The four teachers demonstrate and verbalize their personal development as being at Concern for Impact, a stage described by Fuller (1969) as the third of three developmental stages of teachers. With the two more experienced teachers, Art and Barb, both with more than seven years in the classroom, this is to be expected. The other two teachers, Carl and Doris, have much less experience but appear to have reached that stage already. These findings appear to be consistent with Bendixen-Noe and Redick (1995) who described non-traditional teachers as moving more quickly through the stages than their traditionally prepared counterparts.
Reflection is described as part of the growth process of teachers (Meyerson, 1993; Zehm & Kottler, 1993). These four teachers demonstrate consistent use of reflection. Barb spends her first period prep time preparing the day’s lessons, reflecting in what Louden (1991) calls the preactive and postactive modes, on problems and progress from the previous day. In real-time reflection during lessons, she considers what isn’t working and why, and changes her strategies accordingly. Art does the same with his classes, usually stopping for small-group or individual work, if he hears his students having problems with a musical selection. Doris employs preactive, real-time and postactive reflection in her teaching. Carl’s use of real-time reflection is usually demonstrated with his stopping one-on-one work with a student to present a brief lecture-demonstration on the chalkboard for the entire class. It would appear that this concern for outcome, as demonstrated by ongoing reflection, indicated an advanced developmental stage of concern (Fuller, 1969).

All four teachers consistently focus on student growth and achievement. There is no evidence of Stage One, Concern for Self, nor of Stage Two, Concern for Task. In fact, all four teachers allude to and minimize the need to “get through the syllabus,” in favor of helping students master the content before moving on. They do not minimize the always-present criteria of standardized testing in their schools; however, they are unanimous in identifying student growth as their priority (Bendixon-Noe & Redick, 1995).
Influence of Education

In terms of the influence of education on their teaching, all four teachers took classes at the same local university in the College of Education. Barb and Doris completed their undergraduate degrees and the requirements for licensing as returning adult students. Carl and Art took graduate courses, already having undergraduate degrees. Carl completed his licensing requirements at another university. Art took the courses required by the state to update the out-of-state license that he had never used.

Art could not recall any university course work that had a significant impact on his teaching. Barb credits her supervising teacher as having modeled many of the classroom management methods she uses. Carl credits his military instructor training with giving him his classroom skills. Doris credits her current graduate courses with offering her ideas for classroom activities. Generally, the four teachers do not cite any specific university course work as having had a significant impact on how they taught.

Prior Career Choice

All four teachers elected to teach in areas related to their undergraduate degrees and/or their initial career choice fields. Based on personality type data, the four teachers selected career choices in teaching – content area and level – strongly represented by their personality type data. Only one, Barb, is teaching at a level lower than her personality type usually selects. She is at the high school level and NFs are more frequently found at the community college or
university level. She does periodically substitute teach in a community college math class.

Prior Experience

All four teachers feel that their prior work/life experience has more of an impact on their teaching than does their educational course work. One in particular, Art, elected an initial career as a professional musician in order to teach music more skilfully.

The four teachers speak of their work and life experience as enabling them to better relate to and manage their students. They feel that the skills they have learned in other careers, as well as their interaction with their peers in other careers, give them skills they transfer to the classroom.

Administration

Administrative support does not appear to have been a factor in the participants’ selection and use of instructional strategies and media. All study participants feel that they have administrative support for whatever strategies or media they chose to use in the classroom, and for any resources allowed in the budget. All four of the teachers have opportunities for professional growth workshops and seminars made available to them by their supervisors. Their supervisors rate them highly and frequently observe their classes, not to evaluate them, but to experience what they feel is superior teaching.
Resources

Resource constraints appear to have more to do with available money than with philosophical differences between teacher and administration. A constraint shared by the math teachers is a lack of computers. Also, Carl described feeling hampered by lack of funds to develop more real-life applications of math for his math students. Art feels constrained only by the school schedule that makes it difficult to bring in guest artists during the day. He feels that this experience of interacting with professional musicians is an important part of his students' musical education.

Class Size

The teachers do not appear to be constrained by the sizes of their classes or classrooms in their selection of instructional strategies and media. The three math teachers are all working in very crowded classrooms but manage to configure the seating to match their preferences for small or large group work. In Carl's and Doris' classrooms, there is barely room to walk between the desks but each has made the most of the space available to set up individual work stations and small-group configurations. Because of unprecedented growth in the district, overcrowding is predicted to continue for some time. These teachers appear to be skilled in dealing with this constraint.
Part Three: Recommendations

Following a review of the findings of this study, several recommendations were formulated. These included recommendations for further research, and for practice.

Recommendations for Further Research

1. This present study yielded data on the relationship between learning styles and teaching styles of four teachers over a limited period of time. It is recommended that this study be replicated with a larger group of participants for each MBTI learning styles' quadrant, over a longer period of time.

2. Psychological type theory posits that people self-select into career choices that support their type preferences. This study looked at four teachers teaching in two content areas, music and mathematics. It is recommended that the study be conducted with teachers in varying content areas, as well as with all teachers in the same content area.

3. The data indicate that Carl, an NF, was eminently suited to his position in an alternative high school, embodying the school goals and philosophy and implementing strategies that often resulted in motivated learners. Carl was replaced by a teacher with his personality type who was already feeling the commitment to teaching in the alternative environment that Carl had had. It is recommended that teachers in alternative schools be studied to identify whether they share common characteristics and/or personality traits.
4. Peer/researcher triangulation resulted in low inter-rater reliability because of lack of uniform methods for tallying instructional strategies. It is therefore recommended that greater emphasis be placed on training prior to video coding by another reviewer. A practice tape could be developed that would be coded by both the researcher and the peer reviewer for practice. In addition, it is recommended that permission be obtained for more than one peer reviewer for the videotapes for additional triangulation.

Recommendations for Practice

1. The present study yielded noteworthy findings on the impact of prior work and life experience on non-traditional teachers. All participants attributed their teaching practices more to the prior work and life experience than to their education courses. All used examples from their prior careers in their teaching, and tended to focus on real-world applications for lesson content, when possible. All noted the interpersonal skills developed in prior careers as being helpful with activities such as managing the classroom and helping students work through personal problems. It is therefore recommended that teacher educators consider prior work and life experience in planning and implementing curricula for non-traditional preservice teachers. For example, class discussion could focus on real-world applications of content areas, draw on prior experience, and surface strengths as well as weaknesses of prior experience as a model for teaching. Non-traditional teachers who thrived in pre-teaching careers where attention to minute detail was required (Sensors) may not be
aware that they need to include global, big-picture aids for their students who
are not detail-minded (Lawrence, 1993; Myers & McCaulley, 1985). The opposite
is also a consideration. Big-picture abstract thinkers (Intuitors) may sometimes
ignore the details some students need to complete assignments and progress
(Lawrence, 1993; Myers & McCaulley, 1985). Teachers have heard both needs
expressed by students. The detail-minded student asks “How long?” “How big?”
“What order?” “When?”; the more global student chafes at specific directions
and may say, “Just tell what to do and I’ll do it. Skip the details.”

2. Teacher educators should make greater use of learning styles
instruments to help preservice teachers understand their own preferences and
how they might affect their teaching. For example, the use or avoidance of
collaborative learning, viewed through the lens of the preservice teachers’
personality types could be used in curriculum planning for teacher education.
Much research evidence proves the worth of collaborative learning in the
classroom, but if preservice teachers have always worked alone effectively, or
prefer to learn individually, they may not be open to collaborative learning
environments (Johnson, Johnson & Stanne, 1985; Slavin, 1990; Sharon, 1980).
If a teacher’s personality type is one that has not been found to be open to
learning and using technology (Jones, 1993; Rude-Parkins, Baugh, & Petrosko,
1993), and their prior careers or experience did not expose them to the uses of
technology, strategies can be developed to help preservice teachers understand
that their personal preferences or experiences are not always shared by
students (Lawrence, 1993). Instructional strategies that incorporate technology into the curriculum are essential and have been validated by numerous studies and recommendations of researchers and governmental bodies (Dwyer, 1994; The Secretary's Commission on Achieving Necessary Skills, 1991; U.S. Congress, 1995).

3. Learning styles differences should be addressed in methods classes for preservice teachers. Strategies for reaching diverse learning styles should be discussed and practiced. Such strategies can include increased wait time, combined with advance notice of a question, to accommodate Introverts' preference for processing internally before disclosing publicly. Also, a combination of individual and group work accommodates Introverts and Extroverts. Individual learning contracts help Intuitor Thinkers, while group work with clearly detailed instructions helps Sensor Thinkers. Student-led discussions, planned in advance, are helpful to Extroverts who process orally, and to Introverts if given time to prepare by processing internally.

4. It is recommended that teacher educators assess their own learning styles and become informed on the subject in order to better facilitate coursework in the subject with preservice teachers. Teacher educators can model strategies that attend to diverse learning styles informing and explaining to students while they do so. It is impossible to design every lesson to fit every learning style; however, teacher educators can provide strategies for preservice students that can help them include activities that provide something for every
learning style in a given day, if not in a given lesson. Concepts can be presented using one or two strategies, practiced using different strategies, and performed with choices offered to students on assessment.

Postscript

I visited the schools the semester following the study and found that Art’s class sizes had increased enormously. An entire grade level from a school under construction had been moved temporarily to Arlen. In one case, he had 120 students in a band class. Obviously stressed, he was nevertheless attempting to continue with his usual method of teaching. He felt that the biggest loss was his inability to get to know the students better because there were so many.

Despite the fact that Barb had been given an opportunity for a classroom in the main school building, something she had said she wanted, she elected to stay in her mobile classroom. In a conversation that took place after the current semester began, she couldn't believe she said she wanted to leave the mobile classroom. She decided she “loved that classroom.” She was willing to forego the peer interaction she had indicated was important to her until there was a major reason for moving to the main building.

Carl was not able to return to Canyon South. His replacement at Canyon South is James, a teacher very similar to him in a number of ways. A retired military person, James is familiar with the MBTI and told me that his personality type was ENTP. He shared the ENT preferences with his predecessor, an ENTJ, and had also had military instructor training. Coincidentally, I had supervised
James' practicum, so I was familiar with his teaching. In a traditional school, James had established boundaries very quickly and used humor a great deal for classroom management. His consistently positive feedback to students was reminiscent of Carl's positive approach to building self-esteem. James and I had several conversations the first few weeks of his new job. A first year teacher, he was still much concerned with Stage Two—Concern for Task. Because of his maturity and experience, I could also see the potential for his progressing quickly to Stage Three, Concern for Impact.

Doris described her students this semester as being even more troubled than last year's students, and coming to school with many more problems. She had already had several incidences of violence in the classroom. Despite this, she was determined to remain at her school as long as her health remained stable.
APPENDIX A

DIRECTIONS

Do not open the booklet until you have read all the directions and answered all the questions.

There are no "right" or "wrong" answers to these questions. Your answers will help show you how you like to look at things and how you like to go about deciding things. Knowing your own preferences and learning about other people's can help you understand where your special strengths are, what kinds of work you might enjoy, and how people with different preferences can relate to each other and be valuable to society.

Read each question carefully and indicate your answer by making an "X" in the appropriate box next to the response you select. Do not think too long about any question. If you cannot decide how to answer a question, skip it, and return to it later. If you make a mistake, do not erase but blacken in the box marked in error.

Now, unless you have been instructed otherwise, turn the booklet over and begin answering the questions.
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APPENDIX C

Observation Diagram

Date _______________ Time _______________ Location (SA, SB, SC, SD) ¹ ______________

Grade Level _____ Class _____ Lesson ______________________

Subject (A, B, C, D) _____ Number of Students ______________

Student Demographics

Gender

Male _____ Female _____

Ethnic Makeup

Caucasian _____ African-American _____

Hispanic _____ Asian _____

Pacific Islander _____

Classroom Setup Drawing

¹Identification of participants will be as follows: The participants will be A, B, C, D. Schools will be identified by the addition of S to the participant, e.g., SA will represent the school at which subject A is teaching.
APPENDIX D

GAGNÉ AND BRIGGS' (1974) NINE INSTRUCTIONAL EVENTS

1. Gaining attention
2. Informing the learner of the objective
3. Stimulating recall of prerequisite learnings
4. Presenting the stimulus material
5. Providing "learning guidance"
6. Eliciting the performance
7. Providing feedback about performance correctness
8. Assess the performance
9. Enhancing retention and transfer (p. 123)
APPENDIX E

Part 1: Demographics

(Participants will be identified as A, B, C, D. Schools will be identified as SA, SB, SC, SD.)

You understand that this interview will be recorded and that the transcript will assure you and your school anonymity.

This is a two-part interview. The first part of the interview is to help me learn more about your background, how you came to the teaching field, the program you went through to earn your teacher's license, your teaching assignments including your current one, and your long-term professional goals. The second part will cover instructional strategies.

1. How long have you been teaching?
2. What participant area(s) do you teach?
3. What grade level(s) do you teach? Have you always taught at these levels?
4. Have you taught in school districts other than where you now teach? (Probe for length of assignment, participant areas, grade levels.)
5. Did you have another career before you went into teaching? (If yes, continue through #8. If no, go to #9.)
6. What was your undergraduate major? Your graduate major (if applicable)?
7. Was your previous career related to that major, that is, did you use the skills and knowledge from your major in your job? (Probe for information on whether the job/career supported personality type preferences, e.g., working alone or with others, highly structured or unstructured.)
8. Why did you change your career to teaching?
9. What type of program did you go through to prepare to teach? Undergraduate? Graduate?
10. What type of in-classroom preservice experience was required in your program? (observation, practicum, semesters of student teaching)
11. What are your long-term professional goals?
APPENDIX F

Administrator/Chair Interview

(Participants will be coded as AA, AB, AC, AD.)

You understand that this interview will be recorded and that the transcripts will protect your identity and that of the school.

This interview is in two parts. The first part will explore a little bit about your background and about the teaching strategies that are important to your school and to you as administrator/chair. The second part will explore the observations or perceptions you have about (the participant’s) use of instructional strategies.

Part 1: School Emphasis

1. What is your current role at this school?
2. How long have you had this assignment?
3. How long have you worked with (participant)?
4. Are you currently teaching?
5. Are there certain teaching strategies that your school system is emphasizing? What are they? What about your school? What are they? What about (the participant’s) department? What are they?
6. What are some of the strategies you have observed (the participant) using? How do they fit in with the strategies your school system, school, department are emphasizing?
7. How often do you have an opportunity to observe (the participant) in the classroom?
8. What kinds of classes, inservice activities or other experiences are available to the staff? What professional growth activities are encouraged?
9. Given generous funding, what teaching resources would you make available to the school, (the participant), and other teachers?
10. What other observations would you care to share about (the participant’s) use of instructional strategies?
APPENDIX G

Post-Observation Interview

Follow-up interviews with participants will be situation-specific within the framework of the scope and sequence of the period(s) observed. Because the observations will most probably be of two to three classes each visit, with little or no time between for period-specific interviews, the interviews will cover the classes observed that day with verification of use of strategies and media the primary purpose, and clarification of teacher purpose secondary.

If possible, the researcher will schedule the post-observation interviews for the end of the day. Unless the participants have a between-period prep time and are willing to offer that time, shifting their lens from preplanning to reflection in mid-day may be intrusive and counter-productive (Ericcson & Simon, 1980).

Sample Interview Questions

1. In the __________ class today, what were your teaching objectives, that is, what was the scope of what you planned?

2. How did it go for you?

3. I noticed that you used (strategy) to (elicit/model ___behavior). How did you select that strategy?

4. Your use of (media) was interesting. Tell me about your choice.

5. Was there any point in your teaching during which you remember changing your planned strategy? Tell me about it.

6. What did you sense was particularly effective today? Have you used that (strategy, media) before?

7. What, if anything, would you change or vary of the (strategies, media) you used today?

8. Other questions based on specifics observed would be added; however, this interview would be structured for brevity and efficiency.
DATE: December 13, 1995

TO: Teresa M. Delgadillo Harrison - ICS
M/S: 3005

FROM: Dr. Frederick W. Preston
Chairman, Social Behavioral Committee of the Institutional Review Board

RE: Status of Human Subject Protocol entitled:
"The Influence of Teachers' learning Styles on Their Teaching Styles as Demonstrated by their Selection of Instructional Strategies and Media"

OSP #311s1295-100

The Social Behavioral Committee of the Institutional Review Board met on December 7, 1995 to review your human subjects protocol referenced above. The Committee has requested the following revisions be made to your protocol:

On both Consent Forms, the last sentence needs to be revised on the form that starts "Your Signature Below....and that you understand the information..." The words "have read" should be changed to "understand".

Please make the above changes and submit to the Office of Sponsored Programs, ATTN: Marsha Green, in Room FDH 302, M/S 1037. When the revised protocol is received in OSP, the approval letter will be sent to you through your advisor.

If you have any questions regarding the above, please contact the Office of Sponsored Programs - Marsha Green - at Ext. 1357.

cc: Drs. S. Zehm & N. Strudler (ICS-3005)
OSP File
DATE: December 27, 1995

TO: Teresa M. Delgadillo Harrison - ICS
M/S: 3005

FROM: Dr. Frederick W. Preston
Chairman, Social Behavioral Committee of the
Institutional Review Board

RE: Status of Human Subject Protocol entitled:
"The Influence of Teachers' learning Styles on Their
Teaching Styles as Demonstrated by their Selection of
Instructional Strategies and Media"
OSP #311s1295-100

This memorandum is official notification that the protocol for
the project referenced above has been approved by the Social
Behavioral Committee of the Institutional Review Board. This
approval is approved for a period of one year from the date of
this notification, and work on the project may proceed. At the
end of the year, you must notify this office if the project will
be continued.

Should the use of human subjects described in this protocol
continue beyond a year from the date of this notification, it
will be necessary to request an extension.

If you have any questions or require any assistance, please give
us a call.

cc: Drs. S. Zehm & N. Strudler (ICS-3005)
OSP File
February 29, 1996

Teresa Delgadillo Harrison
Department of Instructional and Curricular Studies
University of Nevada, Las Vegas
4505 Maryland Parkway
Box 453005
Las Vegas, Nevada 89154-3005

Dear Ms. Harrison:

At its meeting on February 22nd, 1996, the Clark County School District Committee to Review Cooperative Research Requests reviewed your proposal to study "The Influence of Teachers' Learning Styles on Their Teaching Styles as Demonstrated by Their Selection of Instructional Strategies and Media." The committee is pleased to approve your proposed research, with the following provisos:

1. Release forms for all students who would be videotaped must be obtained prior to any actual videotaping.

2. Prospective teacher participants must be identified through UNLV classes rather than by CCSD.

3. The principal of any possibly participating school must be willing for you to conduct your research in his/her school. We will help you identify schools willing to participate after you have identified prospective teacher participants.

If you have any questions, please feel free to contact me at 799-5403.

Thank you for inviting the district to participate in your research.

Sincerely,

Judith S. Costa, Chairman
Committee to Review Cooperative Research Requests

cc: Don Anderson
    Tom Barberini
    LeRoy Hurd
    Dan Hussey
    Craig Kadlub
    Lauren Kohut-Rost
    Connie Kratky
    Charles Rasmussen
    Carla Steinforth
    Stanley Zehm
APPENDIX J

PROJECT TITLE
Learning Styles and Teaching Styles Project

Statement of Age of Subject
I state that I am over 18 years of age, in good physical health, and wish to participate in a program of research being conducted by a doctoral candidate at the College of Education, University of Nevada, Las Vegas, Department of Instruction and Curricular Studies.

Purpose
I understand the purpose of this research is to explore the influence of teachers' learning styles on their teaching styles.

Procedure
I understand that the procedure will include my completion of a pre-visit instrument, three research interviews, and three observations of my teaching by the researcher, including one of which will be videotaped. I understand the videotape will be destroyed after the researcher uses it as the basis of one of the interviews, thereby protecting my anonymity and that of any students who may have been filmed inadvertently.

Confidentiality
I understand that my participation in this study will not impact on my school system's formal evaluation of my teaching, nor will it substitute for that evaluation.

Benefits and Freedom to Withdraw and Question
I understand that all information collected in this study is confidential and neither my name nor place of work will be identified at any time. I understand that the information collected during this study will be read by the researcher's doctoral committee members: Drs. Zehm, Strudler, Jones, Meyerson and Perkins. When the work is completed and approved, it will be made available to the general public.

I understand that the study is not designed to help me personally, but that the researcher hopes to learn more learning styles and teaching styles to add to the body of literature on teacher education. I understand that I am free to contact Teresa Harrison at 436-6160 with questions or to withdraw from participation at any time without penalty.

YOUR SIGNATURE BELOW WILL MEAN THAT YOU HAVE DECIDED TO VOLUNTEER AS A PARTICIPANT IN THIS STUDY AND THAT YOU UNDERSTAND THE INFORMATION WRITTEN ABOVE.

Signature of Participant, Date ____________________________ Signature of Researcher, Date ____________________________

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Part 2: Strategies and Media


This second part of the interview is to help me learn about the types of instructional strategies and methods you use in your classroom and to gain your perceptions about how you have selected these strategies and media, that is, what might have influenced you to do so. This part of the interview will also be recorded and the transcripts of the interview will protect your identity as well as that of your school.

1. **Warm-Up Question:** It is Open House night at your school, early in the semester, and you are telling parents what they can expect for their children during the coming year. What are the teaching strategies and media you would describe to them?

2. If you had the opportunity to select any resources for your classroom, what would you select?

3. What were some of the teaching strategies that you learned as part of your preservice courses and experiences? Do you use any of these in your classes? How frequently do you use them?

4. What are the teaching strategies with which you feel comfortable? How frequently do you use each of these?

5. Have you tried to modify new teaching strategies for your classroom? If so, tell me about these.

6. What types of grouping patterns do you use in your classroom? Why?

7. Of your preservice educational experiences, what do you think contributed most to your learning about a variety of teaching strategies? (Probe)

8. When you began teaching at your current assignment, what type of inservice, assistance, or information were you given to help you get started as a teacher in relation to the types of teaching strategies you used?

9. To what extent do you share information and ideas about teaching strategies with other teachers on your staff? If you share, how does that sharing take place? (Probe) How often does this happen? Once a month? Once a week? More frequently?
10. When you began working at your current assignment, were you allowed to use whatever teaching strategies you wanted to use? Were there particular teaching strategies that you were encouraged to use? Where there any you were discouraged from using? (Probe for conditions)

11. Are there certain teaching strategies that your school system is emphasizing? What are they? What about your school? What are they? What about other teachers in the building? What are the strategies they are using?

12. What kinds of classes, inservice activities, or other experiences have you participated in that helped you learn teaching strategies? What are the strategies you learned? Have you used these strategies in your classes? How often?
**APPENDIX K**

<table>
<thead>
<tr>
<th>PROJECT TITLE</th>
<th>Learning Styles and Teaching Styles Project</th>
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</thead>
<tbody>
<tr>
<td>Statement of Age of Subject</td>
<td>I state that I am over 18 years of age, in good physical health, and wish to participate in a program of research being conducted by a doctoral candidate at the College of Education, University of Nevada, Las Vegas, Department of Instruction and Curricular Studies.</td>
</tr>
<tr>
<td>Purpose</td>
<td>I understand the purpose of this research is to explore the influence of teachers' learning styles on their teaching styles.</td>
</tr>
<tr>
<td>Procedure</td>
<td>I understand that, as an administrator or department chair, I will be interviewed once by the researcher, after three interviews and observations of the teacher participant from my school have been conducted. I understand that my participation in this study will not impact my school system's formal evaluation of my teacher, nor substitute for that evaluation.</td>
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<td>Confidentiality</td>
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</table>

YOUR SIGNATURE BELOW WILL MEAN THAT YOU HAVE DECIDED TO VOLUNTEER AS A PARTICIPANT IN THIS STUDY AND THAT YOU UNDERSTAND THE INFORMATION WRITTEN ABOVE.

| Signature of Participant, Date | Signature of Researcher, Date |

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Dear Parent or Guardian:

I am presently involved in research for my doctoral dissertation at the University of Nevada, Las Vegas, College of Education. I am studying several teachers' teaching styles by observing them in a number of classes.

One of the activities for my research involves videotaping the teacher while he or she is teaching an actual class. I have selected a class in which your child is a student. The teacher is [NAME REDACTED]. I would like permission for your child to be in the class while I videotape [NAME REDACTED]. My purpose is not to directly videotape the students but there is always a possibility that a student will be recognizable in the videotape. The only persons who will see the tape are myself, another doctoral student who will view it to verify my observations, and my doctoral committee of five professors. The Clark County School District has given me permission to do this research.

If you agree that your child may remain in the room when I videotape [NAME REDACTED], please sign and have your child return this form the day after break, April 8.

Cordially,

Teresa Delgadillo Harrison
Doctoral Student
UNLV/Instructional and Curricular Studies

I have decided to allow my child to participate in a study of teaching that will be conducted in [CLASS REDACTED] class. My signature indicates that I have read the information above and have given permission for my child to participate. My child's signature indicates that he or she understands that Mr. Kissel will be videotaped while teaching and that he or she will be in the classroom and may appear on the tape. I realize that I may withdraw my child (or my child may withdraw) without prejudice at any time after signing this form should either of us decide to do so.

Child's Name ________________________________

Parent/Guardian Signature ____________________________ Date ________

Child's Signature _________________________________ Date ________
### Observation Checklist

#### Nine Instructional Events

1. Gaining attention
2. Informing the learner of the objective
3. Stimulating recall of prerequisite learnings
4. Presenting the stimulus material
5. Providing "learning guidance"
6. Eliciting the performance
7. Providing feedback about performance correctness
8. Assessing the performance
9. Enhancing retention and transfer

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<th>Event</th>
<th>Example</th>
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<td>Gaining attention</td>
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<tr>
<td>Informing the learner of the objective</td>
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<tr>
<td>Stimulating recall of prerequisite learnings</td>
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<tr>
<td>Presenting the stimulus material</td>
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<tr>
<td>Providing &quot;learning guidance&quot;</td>
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<tr>
<td>Eliciting the performance</td>
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<tr>
<td>Providing feedback about</td>
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<tr>
<td>Assessing the performance</td>
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<tr>
<td>Enhancing retention and transfer</td>
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<th>realia</th>
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# Appendix N

## Synopsis of Study Phases

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<tr>
<th>Research Step</th>
<th>Rationale</th>
<th>Criteria</th>
<th>Method</th>
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<tr>
<td>1. Identify approximately 50 teachers to complete Form G of the MBTI.</td>
<td>General population figures indicate % of 4 quadrants is uneven in the U.S. population; need larger number to find representatives of the four quadrants: ST, SF, NT, NF.</td>
<td>&gt;2 years of teaching to insure socialization process is advanced and Fuller's Stages of Concern are beyond Stage 1 (self); 28-50+ years to include more developed personality type.</td>
<td>Ask Advisement for possible candidates from files; check M.Ed. files in ICS; contact principals at schools in area; explore possibility of in-class administration of MBTI in Grad Ed. Classes.</td>
</tr>
<tr>
<td>2. Identify 8 potential participants from the pool of 50.</td>
<td>Two from each quadrant (ST, SF, NT, NF) to make sure there is a substitute available in case of drop out.</td>
<td>Willingness to participate in study; plans to stay at school site through semester of research.</td>
<td>Scoring of MBTI</td>
</tr>
<tr>
<td>3. Compare MBTI results with database to explore types and participants taught.</td>
<td>Establish further validity of MBTI for study.</td>
<td></td>
<td>CAPT Manual data</td>
</tr>
<tr>
<td>5. Conduct initial semi-structured interview with each of 4 participants; begin constant comparative method.</td>
<td>Identify each participant's assessments of instructional strategies and media they use in the classroom.</td>
<td>Interview will suggest strategies and media if participants do not identify them.</td>
<td>Recorded interviews transcribed and coded for themes and media selection.</td>
</tr>
<tr>
<td>6. Observe each participant during at least five class sessions.</td>
<td>This many observations are necessary to get good picture of patterns of strategy and media use.</td>
<td></td>
<td>Checklist of strategies and media and notepad for narrative.</td>
</tr>
<tr>
<td>7. Identify a class to videotape for each participant and obtain parental permission from students who will be in the class.</td>
<td>Video is necessary for data collection through stimulated recall.</td>
<td></td>
<td>Videotape and notes for cross-verification.</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Methodology</th>
<th>Data Collection</th>
</tr>
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<tbody>
<tr>
<td>8.</td>
<td>Conduct stimulated recall interviews with each participant; continue constant comparative method.</td>
<td>To have participants explain why they selected given strategies and media and to compare against learning styles preferences.</td>
<td>Lawrence's (1993), Myers &amp; McCaulley's (1985), and Thompson's (1984) identification of learning styles preferences.</td>
</tr>
<tr>
<td>9.</td>
<td>Observe final time using checklists with participants' previously identified preferences for strategies and media.</td>
<td>Validation of prior interviews.</td>
<td>Consistency with prior checklist with additions and deviations noted.</td>
</tr>
<tr>
<td>10.</td>
<td>Conduct interviews with supervisors who know participants' methods.</td>
<td>Validate that behaviors are displayed consistently.</td>
<td>Checklist results from observations and interviews</td>
</tr>
<tr>
<td>11.</td>
<td>Complete transcription of interviews and observation audiotapes</td>
<td>Needed data analysis through constant comparative method</td>
<td>Separate 4 participants</td>
</tr>
<tr>
<td>12.</td>
<td>Tabulate observation checklists.</td>
<td>Document frequency of use of instructional strategies and media.</td>
<td>Total tally individual observation tally by participant</td>
</tr>
<tr>
<td>13.</td>
<td>Compare interview data to checklist summary</td>
<td>Identify participants' perceptions of what they use and actual tally</td>
<td>Keep comparisons separate by participant</td>
</tr>
<tr>
<td>14.</td>
<td>Identify influences not related to learning styles; compare to personality style data.</td>
<td>Need to document extent of influence.</td>
<td>All influences not previously identified as instructional strategies or media</td>
</tr>
<tr>
<td>15.</td>
<td>Summarize</td>
<td>To provide data for analysis</td>
<td>By case</td>
</tr>
<tr>
<td>17.</td>
<td>Analyze</td>
<td>Answer study questions</td>
<td>Study questions</td>
</tr>
<tr>
<td>18.</td>
<td>Report</td>
<td>To publish findings</td>
<td>Guba's (1981) criteria for qualitative research</td>
</tr>
<tr>
<td>19.</td>
<td>Submit dissertation to committee for review.</td>
<td>Requirement, in part, for doctorate</td>
<td>Follow graduate school guidelines.</td>
</tr>
</tbody>
</table>
APPENDIX 0

CODING PROTOCOL

Data were coded through a series of steps. The major sources for coding were Lawrence (1993), Kroeger and Thuesen, 1988 and 1992, Myers and McCaulley (1985), and Thompson (1984). The sequence is as follows:

1. Transcripts were reviewed for individual examples of MBTI functions, i.e., E/I, S/N, T/F, J/P including learning styles.

2. The transcripts were then reviewed for examples and non-examples (atypical behaviors) of participant quadrant data, i.e., ST, SF, NT, NF.

3. Strategies and media were tallied and accompanying narratives coded for the Nine Instructional Segments.

4. Other factors influencing teaching styles were identified and coded.

5. The data were compared to Thompson's (1984) type-related characteristics of teachers.

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6.1 Test users should evaluate the available written documentation on the validity and reliability of tests for the specific use intended.

6.3 When a test is to be used for a purpose for which it has not been validated, or for which there is no supported claim for validity, the user is responsible for providing evidence of validity.

6.5 Test users should be alert to probable unintended consequences of test use and should attempt to avoid actions that have unintended negative consequences."

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By ____________________________
Authorized Representative

Date 10/25/96

By ____________________________
Teresa Harrison

Date 9/28/96


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