Empowering lifelong learners through knowledge of individual learning processes: a case study at one community college

Ellengray Gutzman Kennedy
Iowa State University

Follow this and additional works at: https://lib.dr.iastate.edu/rtd

Part of the Community College Education Administration Commons, Community College Leadership Commons, and the Curriculum and Instruction Commons

Recommended Citation
Kennedy, Ellengray Gutzman, "Empowering lifelong learners through knowledge of individual learning processes: a case study at one community college" (2003). Retrospective Theses and Dissertations. 595.
https://lib.dr.iastate.edu/rtd/595

This Dissertation is brought to you for free and open access by the Iowa State University Capstones, Theses and Dissertations at Iowa State University Digital Repository. It has been accepted for inclusion in Retrospective Theses and Dissertations by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.
NOTE TO USERS

Copyrighted materials in this document have not been scanned at the request of the author. They are available for consultation in the author's university library.

167,192-196

This reproduction is the best copy available.

UMI®
Empowering lifelong learners through knowledge of individual learning processes:

A case study at one community college

by

Ellengray Gutzman Kennedy

A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Major: Education (Higher Education)

Program of Study Committee:
Larry H. Ebbers, Major Professor
   Robert J. Barak
   Sharon K. Drake
   Daniel C. Robinson
   Mack C. Shelley

Iowa State University

Ames, Iowa

2003

Copyright © Ellengray Gutzman Kennedy, 2003. All rights reserved
This is to certify that the doctoral dissertation of

Ellengray Gutzman Kennedy

has met the dissertation requirements of Iowa State University.

Signature was redacted for privacy.

Major Professor
Signature was redacted for privacy.
For the Major Program
DEDICATION

This dissertation is lovingly dedicated to my husband, Charles Ambrose Kennedy, who is my foundation and my soul mate; and to my sons, Wm. Patrick and C. Stuart, who are my pride and inspiration. Your sacrifice, love, and support enabled me to pursue my MBA from the University of South Dakota and my Ph.D. from Iowa State University.

I also dedicate this work to my late father, Dr. Wayne W. Gutzman. You will always be my cornerstone and my inspiration to “do my best.” Your dedication to our family and to higher education greatly influenced my philosophy on life and education.

Thank you for being “the men in my life”, and for being such wonderful examples and mentors.
TABLE OF CONTENTS

LIST OF TABLES vii

ABSTRACT viii

CHAPTER 1. INTRODUCTION 1
  Background and Overview 1
  The Paradigm Shift 2
  Statement of the Problem 7
    Research topic 7
    Overarching research and exploratory questions 7
    Justification of the research problem 8
  Need for the Study 9
  Audience 10
  Study Limitations 10
  Definition of Terms 11

CHAPTER 2. LITERATURE REVIEW 14
  Overview 14
  The Learning Process 15
  Brain-based Learning 17
  Preferred Learning Styles and Methods 24
    Learning styles 24
    Multiple intelligences 25
    Learning styles and multiple intelligences 29
    Myers-Briggs Type Indicator 31
    Learning styles and Myers-Briggs Type Indicator 34
  Implications for Learning 39
  Summary 42

CHAPTER 3. RESEARCH METHODS 43
  Overview 43
  Qualitative Research Approach and Rationale 44
  Background and Rationale for the Study 46
  Reliability of the LSA Tool 49
  Pilot Project 52
  Research Design 54
  Gaining Access 56
  Participant Selection and Description 59
    Student participants 61
      Focus Group 1 62
      Focus Group 2 62
    Colleague and faculty participants 65
CHAPTER 4. RESULTS AND DISCUSSION
Overview
Development of the Case Study Method
  Designing the study
  Conducting the study
  Analyzing evidence
  Developing conclusions, recommendations, and implications
Results of the Study
  Student focus groups
    Overarching research question 1: Changes in learning
    Overarching research question 2: Perceived outcomes
  Peer debriefing interviews
    Overarching research question 1: Changes in learning
    Overarching research question 2: Perceived outcomes
  Successful learning course evaluations
    Overarching research question 1: Changes in learning
    Overarching research question 2: Perceived outcomes
    Other evaluation results
  Student testimonies
Summary

CHAPTER 5. CONCLUSIONS, RECOMMENDATIONS, AND IMPLICATIONS
Overview
Conclusions
  Theme ONE: Students create environments conducive to learning and improve study skills
  Theme TWO: Students improve grades and reduce stress levels
  Theme THREE: Students gain understanding and appreciation of how they best learn; improve satisfaction and confidence
  Theme FOUR: Teachers influence the learning experiences
Theme FIVE: LSA tool and training accurately reflects students’ learning styles 141
Theme SIX: Communication improves between students and faculty 142
Recommendations 143
Implications 147
Concluding Remarks 150
What is Success? 153

APPENDIX A. COMMUNICATION MATERIALS 154
APPENDIX B. RESEARCH MATERIALS 163
APPENDIX C. TRAINING MATERIALS 172
REFERENCES 207
ACKNOWLEDGMENTS 214
# LIST OF TABLES

Table 1. Myers-Briggs Type Indicator 34
Table 2. Job description of the brain 36
Table 3. Participant roles: Students 64
Table 4. Participant roles: Colleague and faculty members 66
Table 5. Focus group categories 78
Table 6. Emerging themes and related categories 83
Table 7. Relating the research questions and the emerging themes 101
Table 8. Successful learning course evaluation responses to the open-ended question: Has the LSA made a difference in terms of how you approach your other other classes? 129
ABSTRACT

According to Armstrong (1999), almost all students struggle at one point or another in their academic careers. True learning often eludes students due to ineffective study strategies, poor understanding of teacher expectations, limited knowledge of individual learning preferences, and a general confusion over what is superfluous and what is meaningful. The purpose of this study was to determine if students can learn strategies that enhance their ability to learn, reduce intimidation and, thus, manage stress during the learning process in order to maximize learning potential.

The case study method (Yin, 1994) was selected, with the research site being a small, rural Midwestern community college. Status sampling and snowball sampling techniques were utilized to identify research participants (primary data source), and other secondary data sources were used. The overarching research questions were:

1. What are the changes in learning when individual learners gain knowledge of their preferred learning styles?
2. What do students perceive as the outcome of the Learning Style Analysis (LSA) tool and training on their educational and personal lives?

The results of the study revealed six emergent themes:

Theme ONE: Students Create Environments Conducive to Learning and Improve Study Skills.

Theme TWO: Students Improve Grades and Reduce Stress Levels.

Theme THREE: Students Gain Understanding and Appreciation of How They Best Learn; Improve Satisfaction and Confidence.
Theme FOUR: Teachers Influence the Learning Experience.

Theme FIVE: LSA Tool and Training Accurately Reflect Students’ Learning Styles.

Theme SIX: Communication Improves Between Students and Faculty.

This study has implications for students as well as educators who are interested in maximizing learning potential through learning strategies that reduce intimidation and manage stress during the learning process. The study revealed that changes took place in the learning of the students when the individual learners gained knowledge of their preferred learning styles. In addition, the majority of the students perceived the outcome of the LSA tools and training as having a positive impact on their educational experience. The community college in the study should continue to use the LSA tool and training, increase faculty involvement, add additional follow-up tools for the student, and reach out to other educational entities.
CHAPTER 1. INTRODUCTION

Change is the law of life.
Those who look only to the past or present
are certain to miss the future.
John F. Kennedy

A mind once stretched by a new idea
can never go back
to its original dimension.
Oliver W. Holmes

Background and Overview

Teaching is experienced by the participants as deeply emotive and bafflingly chaotic (Salzberger-Wittenberg, Henry, & Osborne, 1983). “Periods of apparent calm are interspersed with sudden frantic turbulence ... classrooms are arenas of confusion where the teachers are gladiators of ambiguity” (Brookfield, 1990, p. 2). Amidst such a puzzling and often perplexing combination, students are left wondering why they were not able to learn from a particular course or instructor. For teachers, it can be equally as difficult to analyze student learning and the learning process accurately. “Being responsive to students’ experiences of learning makes your assessments of your effectiveness as a teacher at least partly dependent on students’ perceptions of what is happening to them” (p. 42).

John Dewey (1933) touches upon the issue of student learning in his book, How we think. Active learning often does not appear neat and orderly. Administrators and faculty sometimes are deceived into thinking learning can take place only amidst a structured and traditional learning environment. Dewey states, “Yet under the name of discipline and good order, school conditions are often made to approximate as nearly as possible to monotony
and uniformity” (p. 53). Students often are left feeling bored and disinterested amidst a sterile and confining classroom atmosphere. Seventy years later, Fink (2003) described frustration with the learning experiences for students:

Beneath several levels of concern is a fundamental need, and that is for students to have a significant learning experience. If this could happen more frequently and more consistently in higher education, everyone – faculty, students, parents, institutions, and society at large – would be more satisfied with the quality of higher education. (p. 7)

**The Paradigm Shift**

According to Barr and Tagg (1995), the mission of higher education is not instruction, but rather producing learning with whatever means works best for each individual student. In order to accomplish this, colleges must shift from the traditional “Instructional Paradigm,” based on the premise of providing instruction, to the “Learning Paradigm” based on the premise of providing learning.

Colleges that understand the concept of the Learning Paradigm take responsibility for learning at two levels: the success for the aggregate of student learning as well as the success of the individual learning. If students participate in the discoveries and problem solving and the college creates environments and experiences that bring students to discover knowledge for themselves, then the college has shifted from the Instructional Paradigm to the Learning Paradigm. In this environment, the college and its stakeholders are concerned with learning productivity versus teaching productivity. Faculty are evaluated and rewarded based on whether or not students are learning, not on whether their lectures are organized or adequate material is covered in each course (Barr & Tagg, 1995).
Barr and Tagg (1995) explained further that the power of an environment is judged in terms of impact on learning in the Learning Paradigm and students are routinely and constantly assessed:

The Learning Paradigm prescribes no one “answer” to the question of how to organize learning environments and experiences. It supports any learning method and structure that works, where “works” is defined in terms of learning outcomes, not as the degree of conformity to the ideal classroom archetype.

Ideally, an institution’s assessment program would measure the “value-added” over the course of the students’ experience at the college. Student knowledge and skills would be measured upon entrance and again upon graduation. (p. 20)

The chief agents for learning in the Learning Paradigm are the learners acting as discoverers and constructors of their own knowledge in a holistic framework. Learning environments and activities are learner-centered and learner-controlled. Unfortunately, many education programs are designed to prevent the natural learning systems from operating. In the Learning Paradigm, learning environments are challenging, win-win, cooperative, collaborative, and supportive. “They are designed on the principle that accomplishments and success are the result of teamwork and a group effort, even when it appears one is working alone” (Barr & Tagg, 1995, p. 23).

Tagg (2003) related that many students “have internalized a separation of school from life, and that virtually assures a surface orientation to learning” (p. 90). When facing a challenge, the Instruction Paradigm creates a new course. Unfortunately, many of the courses developed to show students how-to-learn fell short of the goal of changing the overall experiences of the student because students extracted only what was perceived as useful (Ramsden, Beswick, & Bowden, 1986). A single experience does not change a fundamental orientation to school learning (Tagg).
David Perkins (as cited in Tagg, 2003) coined the term “cognitive economy” of schools to bring to light the costs and gains that students encounter in their educational experiences. A deep approach to learning is a high-cost activity for students as it requires more time, effort, and risk of failure. Tagg considers an institution with a “hot” cognitive economy (Learning Paradigm) as one having an orientation to deeper learning that encourages risk-taking by the students and includes five characteristics that describe the way the institution interacts with the students. A hot cognitive environment emphasizes intrinsic goals, high levels of cognitive activity with appropriate rewards, information with a high ratio of feedback to evaluation, long time horizon with decisions based on the long term, and a strong sense of community. These categories are highly interdependent and the interrelation of the first five is described by alignment. Alignment ensures that institutional behavior is aligned with the learning mission, meaning that all activities, policies, and rewards reinforce desired outcomes. For example, learning environments with organizational structures, such as classrooms with variable seating choices versus lecture halls, need to be aligned to the goal of providing a hot cognitive environment that is learning-centered (Tagg, 2003).

According to Dunn and Dunn (1992), the current educational system (based on the Instruction Paradigm) appears inadequate, considering that approximately 13% of the learners are capable of teaching themselves when provided the appropriate resources. In addition, depending on age and independence levels, close to 30% are able to learn well in pairs or in small groups. Of the individuals who are able to teach themselves, almost 50% are in environments that restrict their progress and proceed based on the needs of the average students in the class and the content, pace, resources of the teacher (Dunn & Dunn).
Teachers who know how to teach to diverse learners are able to statistically increase the students’ standardized test scores (Andrews, 1990; Brunner & Majewski, 1990; Dunn, 1990; Dunn & Griggs, 1988).

The classroom environment, along with the sensory preferences, influences the effectiveness of the student learning. By examining an individual’s multidimensional characteristics, the learning style can be identified, along with what triggers concentration, maintains it, and enhances long-term memory (Dunn & Dunn, 1992).

According to Prashnig (1998), the creation of new paradigms occurs in times of crisis when people often expect and demand change. Joel Barker (as cited in Prashnig) explained the general cycle of the ten steps of the paradigm shift:

1. effective paradigm becomes less effective;
2. affected community begins to lose trust;
3. turbulence grows as the crisis increases;
4. paradigm creators offer solutions;
5. turbulence increases as paradigm conflict becomes apparent;
6. communities become upset and demand clear solutions;
7. new paradigm demonstrates ability to solve problems;
8. community accepts new paradigm out of desperation;
9. paradigm gains momentum with stronger support; and
10. turbulence wanes as new paradigms solves problems.

A combination of holistic education, learning styles, and creative, accelerated learning methods can then become a new standard in schools and the cycle completed as higher
education becomes comfortable with the new paradigm (Learner Paradigm) and level of intolerance for new ideas decrease (Prashnig, 1998).

Traditional educational practices based on mathematical and linguistic intelligences, formal delivery of education, and analytically based teaching methods, do not allow students to develop lifelong learning skills that enable them to survive in the current fast-paced world. Self-esteem and motivation will be increased when students understand themselves as learners, know what is happening to them throughout the learning experience, and produce results that are successful (Prashnig, 1998).

According to Dunn and Dunn (1993), Learning Style is the way in which people “begin to concentrate on, absorb, process, and retain new and difficult information” (p. 2). Learners of all ages can learn better if they know their learning style, strengths, weaknesses, and personal preferences. “When human diversity is taken into account and respected in the learning process ... the results are always positive” (Prashnig, 1998, p. 9).

Prashnig developed the Learning Style Analysis (LSA) tool and training based on the work of Dunn and Dunn and their Learning Style Model (see Appendix C). Both instruments contain scientifically researched style elements that are biologically based and, therefore, remain fairly stable over a lifetime. According to Dunn and Dunn (1993), research dating back thirty years reveals that “three-fifths of learning style is genetic; the remainder, apart from persistence develops through experience” (p. 25). The participants in this case study had been involved in the LSA tool and training at a small, rural, Midwestern community college.
Statement of the Problem

Research topic

Since Dewey, many new trends in education have been created, identified, and applied. In the past, traditional teaching methods and practices worked well in mainstream educational settings. Today the learning environments have changed to include diverse students groups with a broad range of different expectations and attitudes (Prashnig, 1998). Researchers need to look at the effect of empowering students with knowledge of learning processes in order to determine if stress can be reduced and individual learning improved. New paradigms for learning as well as for teaching should be explored.

As long as paradigms are useful and help us perform better, feel better and achieve what we want, they are good for us. But, when existing frameworks do the opposite for us, or are even damaging, particularly in education, we have to look for new ones which serve us better ... For teaching, the new paradigm is: “When students cannot learn the way we teach them, we must learn to teach them the way they CAN learn.” ... For learners it means that understanding one’s own unique brain functions and learning styles will lead to more confidence, greater achievement and long-lasting learning success. (p. 47)

Research evidence is necessary to convince individuals to come to terms with their learning strengths and weaknesses and to ensure that lifelong learners utilize their abilities more confidently (Prashnig).

Overarching research and exploratory questions

The purpose of this case study was to determine if students can learn strategies that enhance their ability to learn, reduce intimidation, and thus manage stress during the learning process in order to maximize learning potential. The overarching research questions were:
1. What are the changes in learning when individual learners gain knowledge of their preferred learning styles?

2. What do students perceive as the outcome of the Learning Style Analysis (LSA) tool and training on their educational and personal lives?

The exploratory questions were:

a. As a result of the LSA tool and training, how, if at all, do learners feel empowered and responsible for their learning, thus, creating environments conducive to successful and satisfactory learning?

b. How, if at all, has the LSA learning experience changed student grades?

c. How has the LSA learning experience affected student satisfaction with the educational experience?

d. Do students feel more or less stress with their academic experiences?

Justification of the research problem

According to Armstrong (1999), almost all students struggle at one point or another in their academic careers. True learning often eludes students due to ineffective study strategies, poor understanding of teacher expectations, limited knowledge of individual learning preferences, and a general confusion over what is superfluous and what is meaningful. “Harvard neurologist Norman Geschwind once said, ‘... practically all of us have a significant number of special learning disabilities.’ They may not be in school-related areas and thus may have evaded detection for years” (cited in Armstrong, p. 171).

Thus, this study examined learning strategies and styles in greater detail from the perspective of the learners at one rural Midwestern community college. It examined how
learners can benefit from a comprehensive understanding of how they best learn, and how the individual learner can use this understanding of learning strategies and styles to take responsibility for creating an environment that maximizes learning potential.

Need for the Study

The importance of understanding brain-based learning, multiple intelligences, the Myers-Briggs Type Indicator, and learning styles are topics of interest to many researchers. According to Prashnig (1998), many students and adults have used the important research of Dunn and Dunn over a period of over 30 years to release learning power. Research dating back to 1979 reveals that experience and persistence are important and that three-fifths of learning style is genetic (Prashnig). Although much has been written about the learning process, brain-based learning, learning styles, and multiple intelligences, most studies and initiatives have focused on the responsibility of the educators to understand the diverse needs of the learner and to create an environment sensitive to individuals. Students have not been the targeted audience for the dissemination of the results.

Tools such as the LSA tool and training are available to assist individuals in assessing their preferred learning styles. According to Prashnig (1998), the learning style model developed by Dunn and Dunn is a research instrument containing scientifically researched style elements that are biological and remain fairly stable over a lifetime. Educators and learners need a method to ensure the understanding of multiple intelligences, personality types, and learning styles and what their implications are for the individual learner. With this common method, all stakeholders can work together, or as individuals, to create positive
learning environments and develop an appreciation of diversity in individual learning (Prashnig).

**Audience**

This study was based on the assumption that if individual learners identify their preferred learning styles and gain an understanding of the multiple intelligences, they can become empowered learners, responsible for their own learning, reduce feelings of inadequacy, and thus manage stress during their learning process. The study examined learning strategies and styles in detail, how lifelong learners at a rural Midwestern community college can benefit from a comprehensive understanding of how they learn best, and how the individual learner can use this understanding of learning strategies and styles to feel empowered, thus, creating an environment that maximizes learning potential. It is important to seek out the silenced and give them voice (Lincoln, 1995). Students will be given a voice about what is important to their learning. Faculty and administrators can also benefit from the results by more fully understanding diverse learning styles and adopting strategies that enhance learning.

**Study Limitations**

The principal limitation of this case study is that the sample was taken from a small rural Midwestern community college, and may not represent the larger population of lifelong learners not included in this research. The majority of the students studied live in rural areas with a low socioeconomic background. While the results could be extrapolated to populations of community college students in similar socioeconomic regions, caution is
warranted in generalizing the results beyond these parameters. Further application to other populations would require additional study.

*Generalizations* are not without risk. "Qualitative case researchers orient to complexities connecting ordinary practice in natural habitats to the abstractions and concerns of diverse academic disciplines. This broader purview is applied to the single case" (Denzin & Lincoln, 1998, p. 92). In fact, the value of the case study is its uniqueness (Denzin & Lincoln). The researcher teaches what he or she has learned and provides material for readers to learn on their own what the researcher does not know as well. What we can learn from a single case is determined from how the case is similar to, and not similar, to other cases. We come to know partly what has happened through others' experiences. The case study researcher emerges from a set of experiences and the observation to write the report and, thus, assist the readers in the construction of knowledge; at this time, generalizations often are an unconscious process. Case researchers are moved to share ideas and pass along to readers' personal meanings of events and relationships, while failing to pass along others. Readers with intrinsic interest in the case learn from the description. Illustration as to how the phenomenon occurs in the particular circumstances can be valued and trustworthy knowledge (Denzin & Lincoln).

**Definition of Terms**

For clarity of understanding, key terms are defined as follows:

*Brain-based Learning*: Learning that recognizes the brain's rules for meaningful learning, and thus organizes the teaching/learning environment based on these rules (Caine & Caine, 1991).
Learner: According to the Random House Dictionary, a learner is one who acquires knowledge or skill by study, instruction, or experience.

Learning Disabilities: A term that refers to neurological dysfunctions that affect how a learner gathers, commits to memory, and later retrieves information (Wahlstrom & Williams, 2002).

Learning Process: How one absorbs information, thinks about information, and then evaluates the results (Silver, Strong, & Perini, 1997).

Learning Strategies: Learning skills or a set of knowledge and skills that make learning easier. Learners demonstrate good learning strategies or skills with the ability to control their behaviors, thoughts, emotions, and motivation (Pintrich, 1995).

Learning Styles (LS): Refers to an approach to learning whereby individuals take in information in more than one way (McCarthy, 1996). Learning styles focus on the variety of ways individuals think and feel as they create products, solve problems, and interact (Silver et al., 1997).

Learning Style Analysis (LSA): A learning style assessment tool that comes in three versions: primary, secondary, and adult. The LSA assesses 49 individual elements in six basic areas: left/right brain dominance, sensory modalities, physical needs, environment, social groupings, and attitudes; the first four areas seem to be biologically or genetically determined and the last two areas conditioned or learned (Prashnig, 1998).

Lifelong Learners: Refers to changes in consciousness that take place throughout a lifespan and results in an active and progressive process in order to comprehend intellectual, societal, and personal changes that confront each individual. Lifelong learning suggests the learning and transformation process that takes place from birth to death (Galbraith, 2003).
Multiple Intelligences (MI): a theory to explain how cultures and disciplines shape human potential, to examine and to show varying levels of aptitude in different content areas (Silver, et al., 1997). Eight specific intelligences identified by Howard Gardner (1983) include: linguistic, logical/mathematical, spatial/visual, bodily/kinesthetic, musical/rhythmic, interpersonal, intrapersonal, and naturalist.

Myers-Briggs Type Indicator (MBTI): A method for comprehending, understanding, and eventually accepting differences in human behavior. An instrument used to understand how and why individuals tend to behave and contribute in situations the way they do (Isachsen & Berens, 1988).

Neuroscience: Refers to the study of the brain and the human nervous system, and is the physical foundation of the process of learning (Slywester, 1995).

Paradigms: Sets of rules which define boundaries and help us to behave so that we are successful (Prashnig, 1998).

Traditional Instruction: A model that focuses on teacher-directed instruction, memorization, and recall (Prashnig, 1998).
CHAPTER 2. LITERATURE REVIEW

Chapter 1 outlined the new Learning Paradigm, stated the problem, outlined the study limitations, and defined the terms used as the basis for this study. This chapter explores the learning process, brain-based learning, preferred learning styles, and implications for learning.

Overview

The purpose of this literature review is to identify the attributes of an empowered learner who is responsible for his or her own learning. More specifically, this review and qualitative study focuses on factors that influence the learning process. Traditionally, Western societies focused on educational systems that included the following traits: students seated upright at a desk or table, well-illuminated areas for reading and work, absolute quiet, learning difficult subjects in the early morning, students sitting still, eating not permitted in the classroom, and the thought that older students are better able to adapt to a teacher's style (Prashnig, 1998). The traditional model was teacher-directed and focused on memorization and recall.

As a result of extensive research on maximizing student learning, alternative theories such as MI, LS, and MBTI have replaced the traditional model. However, the theories are still fragmented and limited to specific approaches (Caine & Caine, 1991). This literature review demonstrates that, while much has been written about learner outcomes and achievement, little has been captured about the learners' responsibility for their own learning. Through this brief overview, themes of the learning process, brain-based learning, preferred
learning styles, and implications for learning will begin to emerge. The need for student responsibility for learning, or the benefits of empowered learning, will become palpable.

The Learning Process

Today’s learners require new kinds of skills and knowledge from the learning process, which includes the roles played by teachers, employers, and other leaders. Chief among these is the ability to recognize and foster effective learning processes. Today’s learning environments, whether the classroom, the workplace, or a public forum, require greater skills in communication, collaboration, and community building (U.S. Department of Education, 1999).

Intensive research by University of Chicago Professor Csikszentmihalyi (as cited in Armstrong, 1999) found that employees were most satisfied in jobs for which there is an optimal level of engagement with work tasks. People who were not challenged in their jobs became bored with their work. Workers who had too many work-related demands imposed on them experienced anxiety. Similarly, learners in all environments are most satisfied when there is an optimal level of engagement with their tasks.

In describing the experience of optimal connection, Csikszentmihalyi coined the term flow to explain what happens when a person is totally absorbed in an activity or project. During flow, “an individual experiences a heightened sense of vitality, alertness, strength, control, satisfaction and even transcendence” (as cited in Armstrong, 1999, p. 188). Therefore, a person can experience flow regardless of his or her occupation or learning environment (Armstrong).
Joel Shawn, of the California Center for School Restructuring, said that many aspects of our educational system "are almost toxic to teaching and learning" (U.S. Department of Education, 1999, p. 6). Prashnig (1998), in reflecting on her own formal learning, described it as difficult, frustrating, stressful, and often boring. She attributes negative attitudes toward learning as being a direct result of inadequate formal learning situations that can benefit the learner for a lifetime. Like Csikszentmihalyi, Prashnig believes that learners who are intrinsically motivated tend to retain more of what they have learned and make better use of it in their private and professional lives (p. 271).

The study of the learning process is not new. In 1933, Dewey stated that education took place primarily through individual thought and subjective attitudes. He found learning to consist of both product and process. In other words, the learning process was both logical and psychological. Dewey advocated that teachers should create attitudes favorable to effective learning. Furthermore, he believed that it was critical to learning to arrange subject matters around student interest. Learning could be accomplished through careful and reflective pursuit of an actual process. When the process is too controlled, he agrees with Prashnig's finding that learning results are decreased. Dewey (1933) states that true learning is a reflective activity. His premise is that learning cannot be mere memorization. Instead, learning occurs when the mind grasps the demonstrated proposition and is aware of the points that prove it.

According to Watson (2001), self-explanation is the best method for remembering material. Explaining material to yourself as you read improves your ability to understand and to remember. Knowledge is constructed by building upon existing knowledge. In other words, self-explanation is thinking about and relating to what you already know to
understand something new. In one study, a group of students used self-explanation when studying for a difficult biology test. The students using self-explanation scored on average 32 percent higher than those who did not use self-explanation. The ones who used self-explanation averaged grades of high B or A, and those who did not use this method of study averaged grades of low C or high D (Chi, DeLeeuw, Dhiu, & LaVancher, 1994). A similar study found that students who frequently used self-explanation when studying science achieved at a higher level than students who did not use self-explanation when studying (Chi, Bassok, Lewis, Reimen, & Glaser, 1989).

Fink (2003) searched for ways to provide students with significant learning experiences with both a process and an outcome dimension. A positive learning experience will have a high energy level, engaged students, and will have important outcomes or results. One or more of the following values will be evident: Enhancing our individual life, enabling us to contribute to the many communities of which we will be a part, and preparing us for the world of work (Fink).

According to Fink’s (2003) work, faculty are ready for change and dream of students who “develop a deep curiosity, engage in lifelong learning, experience the ‘joy of learning’, be creative problem solvers, develop key skill in life such as communication skills, mentor others, continue to grow as critical thinkers, and value continuous improvement” (p. 9). Institutions must support the faculty members who make the decision to change.

**Brain-based Learning**

Educators and policy makers are giving heightened attention to the research in *brain-based learning* and its application to teaching and learning. Research in the areas of
neuroscience, biology, and pedagogy are enlightening educators regarding how the brain works and its implications for the classroom (Abbott, 1997).

Brain research is now being used by educators to answer the question, “How do we learn?” Caine and Caine (1997) defined brain-based learning as learning that acknowledges the individual brain’s rules for meaningful learning and organizes learning within those rules. They have identified twelve general theoretical principles for brain-based learning (Caine & Caine):

1. *The brain is a complex adaptive system.* The brain is a parallel processor, which is always doing many things simultaneously. Our thoughts, emotions, and imagination operate concurrently and interact with other modes of information processing.

2. *The brain is a social brain.* Throughout our lives, our brains change in response to the engagement we have with others. Our identity is dependent on finding ways to belong and establishing community. Therefore, learning is influenced by the nature of the relationships in which we are involved.

3. *The search for meaning is innate.* Our search for meaning is driven by our purposes and values, and is dependent upon making sense of our experiences. The search is survival-oriented and continues as we proceed through various experiences in our lifetime.

4. *The search for meaning occurs through “patterning.”* Patterning refers to the organization and categorization of meaningful data. The brain registers the familiar while simultaneously searching for new and novel stimuli. It is constantly searching for meaning, and has difficulty processing meaningless or isolated pieces of information unrelated to what makes sense to a learner.
5. *Emotions are critical to patterning.* Our attitudes and feelings influence what we learn, and our emotions impact our ability to remember and recall information (Rosenfield, 1988). Therefore, an appropriate emotional climate can significantly impact student learning.

6. *Every brain simultaneously receives and creates parts and wholes.* This principle addresses the brain laterality, which identifies the differences between the right and left hemispheres of the brain. Although there is a distinction in a healthy person, the two hemispheres operate interactively and simultaneously in processing information into parts and wholes.

7. *Learning involves both focused attention and peripheral perception.* The brain has the capability to absorb information upon which it is focusing, as well as what is beyond its immediate focus or peripheral perception. Most of the information we perceive peripherally enters the brain unconsciously and without our awareness.

8. *Learning always involves conscious and unconscious processing.* Much of our learning is unconscious and is processed below the level of awareness. Understanding may occur days or weeks after the initial learning experience has transpired.

9. *We have at least two ways of organizing memory.* O'Keefe and Nadel (1978) have distinguished them as taxon and locale memories. The *taxon* system allows for rote learning and recalling relatively unrelated information, which is not related to prior experience or knowledge. The system for *locale* memories, or the spatial/autobiographical memory system, is motivated by discovery and novelty, and searches for meaning by making sense of our experiences. It is always operating and
is inexhaustible. The brain functions more efficiently through the assimilation of meaningful information and experiences, and it remembers best when facts and skills are embedded in the spatial memory.

10. *Learning is developmental.* Although there is no limit to the growth and capabilities of humans to learn more, predetermined sequences in childhood establish the basic hardware necessary for later learning. Development also is shaped by people’s experiences throughout life.

11. *Complex learning is enhanced by challenge and inhibited by threat.* The brain functions most efficiently when appropriately challenged and in an environment that encourages risks. Conversely, learning is inhibited by perceived threat or stress, known as “downshifts” (Hart, 1983). Portions of our brain become inaccessible and are less flexible under threat. However, the brain functions at optimum levels in an environment of relaxed alertness involving low threat and high challenge.

12. *Every brain is organized uniquely, and the structure of the brain changes as we continue to learn.* Thus, with increased learning, our brains continue to become more individualized. Differences in learning also are manifested in various learning styles, talents, and intelligences.

Advanced technologies and dramatic developments in brain research have advanced our understanding of the human brain. Educators believe that the use of brain-based learning will have significant impact upon and substantial implications for the learning process (Sylwester, 1994). More specifically, the fields of genetics, physics, and pharmacology contributed to the knowledge explosion on brain research in the 1990s. The resulting body of
technical knowledge about the brain has developed into a new way of thinking about the organ and has implications for the learning process (Sylwester, 1995).

I still remember the lecture of my life.... I gave a brilliant lecture on how cells get their energy from sugars and fats. I had no notes, but I covered the board systematically from left to right as the period progressed. Everything was organized in my head, and it just poured out the end of that piece of chalk. Nuances were crystal clear. The underlying concepts were powerful and yet obvious. I was hot!

At the end of class, I put my chalk down, dusted my hands on my pants, and asked for questions. I was slightly surprised that there weren’t any, but I attributed that to the clarity of my lecture. ... I used my second meeting with the students to check what they had learned from my brilliant lecture. ...

You may have guessed the outcome already. The lecture of my life was followed by one of the greatest surprises of my life. As I probed their understanding with increasingly easier questions, I was met with complete silence. Finally, I was relieved to see a hand go up at the back of the room. “Yes?” I responded eagerly. “Dr. Zull,” he said, “could you explain about mitochondria again?” (Zull, 2002, p. 136)

In his book, *The art of changing the brain*, Zull (2002) explained that teachers should balance their teaching so that students use both the front and back of their brains. The learner can be challenged in their cerebral cortex in order to enhance learning. The sensory brain is in the back portion of the cortex and in terms of learning, this is where concrete experiences are first recorded. The sensory brain gathers the raw materials or data for reflection, abstraction, and action. The rich mix of light, sound, and sensation taken in should not be underestimated. Vision is central to any concrete experience and understanding how the brain processes vision leads to understanding of the processing of the other senses (Zull).

Zull (2002) further explained that during concrete experiences, physical information from our bodies and the world around us enter the brain through the sense organs. From entry, the data are sent to both the amygdala (emotion monitor) and the specific part of the
cortex relating to the appropriate sense organ, where cognitive meaning begins to form (Zull).

Educators should be encouraged that the brain is capable of seeing great detail and nuances. Whether we are an experienced learner or a novice, our brains basically sense the same things, the difference is the experienced learner or expert knows which part of the sensory data is important. If a student (novice) has difficulty understanding a concept, the learning experience should be reviewed, as observations on how the subject was first introduced as sensory input lead to understanding of why there was a breakdown in the learning experience. Seeing detail requires attention; however, focusing on detail is not necessarily the answer. The amygdala may serve as a barrier to learning by screening instinctively for difficulty or threat. For survival, the amygdala processes data material quickly, but misses the details. Another barrier to learning occurs when one does not understand what “paying attention” means. Attention is about focus and suggests sitting physically still. For biological reasons, paying attention does not mean unrelenting focus on one point. Scanning versus focusing allows the brain neurons to rest as different neurons are stimulated, thus allowing us to “pay attention” for longer periods of time. Implications for learning include asking learners to look at material from a different angle or moving around instead of “sitting still” (Zull, 2003, p. 143).

According to Zull (2003), one of the most “powerful aspects of experiential learning is that the images in our brains come from the experience itself” (p. 145). When all senses are included in the learning experience, our brain is more likely to trust the sensory input, which may in turn calm the amygdala, which means clearer thinking. Therefore, the closer
together the student and teacher are in terms of concrete experiences, the better the learning
(Zull).

Experiential learning engages all of our senses. Lecture format relies heavily on
auditory input to the cortex. If we hear a repeated sound for extended periods of time, the
related neurons become tired and eventually we are mesmerized or tranquilized, literally not
hearing the sound in the end. The apparatus for each of us that forms the sound of the
lecturer’s voice is unique in shape, size, and conformation. The brain can both produce and
detect sound that causes a personal and emotional response (Zull, 2002). Therefore, sound is
a natural vehicle for learning and should be used to enhance learning, not detract from
learning.

According to Zull (2003), emotion is key to learning and there is no more powerful
sensory stimulus of the emotions than smell and taste. The sense of touch also enriches
learning. In addition, there is a sense of body position. Our brain knows if we are seated or
standing, moving or still, relaxed or tense, and the sensory input into our brain as a result of
these actions becomes part of the maps of concrete experiences (Zull). This knowledge on
how the brain works supports the incorporation of the use of all senses into the learning
environment to enhance the learning experience.

According to Bucko (1997), traditional instruction, according to researchers in brain-
based learning, actually may be at odds with how the brain works. In addition, the typical
classroom environment actually may inhibit the brain from learning (Bucko).
Preferred Learning Styles and Methods

Learning styles

O’Keefe (1987) defines learning styles as “characteristic cognitive, affective and physiological traits that serve as relatively stable indicators of how learners perceive, interact with and respond to the learning environment” (p. 16). Messick (1976) posited that our cognitive style addresses the way a person perceives, remembers, thinks, and solves problems. It addresses the “how” of learning. How does one process and experience knowledge? How does one organize and retain information? Does one approach learning sequentially or randomly?

According to Dunn and Dunn (1978), effective components of learning styles include personality characteristics related to areas of responsibility, motivation, persistence, and peer interaction. One should ask, “Do I prefer to work alone or in groups? Am I more cooperative or competitive?”

Physiological components are biologically based as they relate to differences in gender, nutrition, and the physical environment, giving rise to the following questions: Do I learn best in the morning or evening? Am I bothered by temperature variations in the room where I am working or learning (Dunn & Dunn, 1978)?

The research conducted in the area of learning styles shows that individuals learn in different ways. Personal motivation and performance also play a key role in determining an individual’s learning style. Learning is a continuous process of integrating and differentiating experiences. Learners refine differing modes by experiencing them (McCarthy, 1980). Armstrong (1994) pointed out that, within natural learning contexts,
learning styles are pragmatic manifestations of intelligences. However, multiple intelligence theory has its basis in cognition and describes how people use intelligence to solve problems and fashion products (Armstrong). *It is important to appreciate the individual diversity of learners and to understand the differences between learning styles and multiple intelligences.*

**Multiple intelligences**

Traditionally, standardized tests assessed capabilities or intelligences in the area of language and mathematics. Howard Gardner (1983), a developmental psychologist, saw the traditional definition of intelligence as too narrow. He proposed that intelligence could be measured by an individual’s capacity to solve problems or create products that are valued in one or more cultural settings. Gardner did not believe that intelligence could be measured merely by standardized tests.

Gardner’s theory of “multiple intelligences” grew out of our understanding of the human brain. It is more a philosophy of education than a succinct set of teaching methodologies (Armstrong, 1994). In his book, *Frames of mind*, Gardner (1983) suggested the existence of seven basic intelligences that expanded upon the theory that defined intelligence in terms of logical-mathematical and linguistic intelligences that were measured on an IQ test. The seven intelligences evidenced in individual learners originally were described by Gardner as follows:

1. **Verbal/Linguistic:** The capacity to gather, understand, and use both oral and written language. This intelligence includes sensitivity to sound, rhymes, meanings of words, and the different functions of language. Examples of individuals with a high degree of linguistic intelligence would be authors, journalists, and politicians.
2. **Logical/Mathematical:** The capacity to use numbers effectively and to visualize relationships between objects and the environment. This implies sensitivity to the scientific thinking of categorizing, classifying, and understanding abstract patterns. Examples of individuals with a high degree of logical/mathematical intelligence would be scientists, mathematicians, and computer analysts.

3. **Spatial/visual:** The capacity to think in pictures and images, and the ability to perform transformations on these perceptions without the help of visual stimuli. It involves sensitivity to color, line, shape, form, and space. Examples of individuals with a high degree of spatial/visual intelligence would be architects, artists, and designers.

4. **Bodily/kinesthetic:** The capacity to use the whole body to symbolize thoughts and feelings and the ability to produce and work with objects. This includes the fine and gross motor skills involved with coordination, balance, flexibility, and strength. Examples of individuals with a high degree of bodily/kinesthetic intelligence would be actors, athletes, sculptors, and dancers.

5. **Musical intelligence:** The capacity to produce, express, and appreciate musical forms. It includes sensitivity to rhythm, pitch, melody, and tone. Examples of individuals with a high degree of musical intelligence include composers, musicians, and critics.

6. **Interpersonal intelligence:** The capacity to understand people’s motivations, temperaments, intentions, and feelings. This includes sensitivity to facial expression, voice, and body language, and the ability to communicate well and to influence and
organize others. Examples of individuals with a high degree of interpersonal intelligence would be teachers, counselors, and political leaders.

7. **Intrapersonal intelligence**: The capacity to access one's own feelings, including individual strengths and weaknesses. Those with a high degree of intrapersonal intelligence have a high degree of self-awareness and are self-reliant, self-confident, and respond to their intuition. Examples of individuals with a high degree of intrapersonal intelligence would be psychotherapists and religious leaders.

Two additional intelligences explored by Gardner (1999) are as follows:

1. **Naturalist Intelligence**: The capacity to recognize and classify numerous species in the environment and to recognize historical trends and how they have influenced history. Those with a high degree of the naturalist intelligence create analogies between events in history and events in nature. Examples of individuals with a high degree of naturalist intelligence would be environmentalists and historians.

2. **Existential Intelligence**: The concern with "ultimate" issues, the capacity to locate one's role in the universe and to comprehend the "significance of life, the meaning of death, the ultimate fate of the physical and the psychological worlds, and such profound experiences as love of another person" (Gardner, 1999). Examples of individuals with a high degree of existential intelligence would be artists and philosophers.

Traditionalists advocate that intelligence is a trait fixed at birth that remains stable throughout the life span. The MI theory recognizes that different intelligences emerge at varying points in childhood, have the potential to develop, and then begin to decline as a person ages. White European culture values verbal/linguistic and logical/mathematical as the
"apex of intelligence," and this emphasis is promoted by IQ testing. MI theory recognizes that different cultures show intelligent behaviors in a diversity of ways. A variety of assessments are available, enabling individuals to discover that unique combination of intelligences that each person possesses (Armstrong, 1999).

Gardner (1983) stated that each intelligence had to arise from basic tests of talent, skill, or aptitude. The intelligences work together interactively, and it should be noted that within each category there are many ways to be intelligent. In addition, each intelligence can be developed to an adequate level of competence by most people.

In the heyday of the psychometric and behaviorist eras, generally it was believed that intelligence was a single inherited entity, and that human beings, initially a blank slate, could be trained to learn anything, provided that it was presented in an appropriate way. Nowadays, an increasing number of researchers believe precisely the opposite: that each intelligence has its own strengths and constraints; that the mind is far from unencumbered at birth; and that it is unexpectedly difficult to teach things that go against early “naïve” theories or that challenge the natural lines of force within an intelligence and its matching domains. (Gardner, 1983, p. xix)

Gardner (1983) posits that the seven types of intelligence are part of the theory of multiple intelligences. The theory of multiple intelligences (MI theory) describes a more variegated and contextualized picture that challenges the concept of intelligence as a single general capacity that equips its possessor to deal with every situation more or less effectively. MI defines intelligence as the capacity to solve problems or to fashion products that are valued in one or more cultural settings. The intelligences seldom work in isolation, and, although they are not necessarily dependent on one another, Gardner’s approach considers the individualized ways in which people learn (Blythe & Gardner, 1990).

Empirical evidence suggests that the human mind may be modular in design and that different types of symbol use appear in different portions of the cerebral cortex.
(Smerechansky-Metzger, 1995). Gardner noted that people are much more complex than the way they are viewed traditionally by the theories of intelligence, learning, and development. His premise is that people naturally have specific areas of both strength and weakness, and that intelligence and abilities exist in multiple areas of development, as well as in the traditional curricular areas of language and mathematics that most methods of instruction, assessment, and reporting are able to measure (Burchfield, 1996).

Gardner’s theory is based on the simple and profound premise that people are different and are much more capable than previously believed. According to the theory of differences, people learn on a continuum, from novice to expert, in any given domain of learning and development (Hatano & Inagaki, 1983; Walsh, 1991, as cited in Burchfield, 1996). Gardner (1983) proposed that all humans possess the seven intelligences (later expanded) in varying degrees, and, depending on the culture, were identified and valued differently. The distinct characteristics affect what content is taught, but not the process of learning. Multiple intelligence theory has its basis in cognition and describes how people use intelligence to solve problems and fashion products, unlike “learning styles,” which are “pragmatic manifestations of intelligences operating in natural learning contexts” (Armstrong, 1994, p. 13).

**Learning styles and multiple intelligences**

MI theory and Learning Style theory contain several common elements, such as the visual, auditory, and tactile/kinesthetic (Sherfield, Montgomery, & Moody, 2002). Silver et al. (1997) stated that both MI and LS theory combine insights from the fields of biology, anthropology, psychology, and medical case studies, as well as examine art and culture.
However, while some elements and background research overlap between MI and LS theories, there are many more differences. According to Silver et al., learning styles focus on the variety of ways individuals think and feel as they create product, solve problems, and interact. Learning Style models focus on the process of learning and how people absorb information, think about information, and evaluate results.

On the other hand, MI theory focuses on understanding how cultures and disciplines shape human potential and shows different levels of aptitude in various content areas. We know that no individual is universally intelligent, and that certain fields of knowledge engage or elude everyone (Silver et al., 1997).

The interrelatedness, yet distinctiveness, of the MI and LS theories are demonstrated by the following example: A person with a visual learning style may not have visual/spatial intelligence as a dominant intelligence. The individual learner may not be a talented artist who paints well, but may learn best by watching someone else paint a picture. However, the learner’s attempt at painting may lack feeling, depth, and expression. Therefore, this learner has a strong visual learning style but the visual/spatial intelligence is not the dominant intelligence. If, on the other hand, the learning style was visual and the dominant intelligence were verbal/linguistic, the learner would learn to paint by watching someone go through the process, and use his or her verbal/linguistic intelligence to describe successfully how to paint and be able to talk through the process observed (Sherfield et al., 2002).
Myers-Briggs Type Indicator

The Myers-Briggs Type Indicator (MBTI) benefits individuals by helping them learn about themselves and their preferences, indicating why some things come easily to some and why other things are more difficult to do, providing self-awareness in a variety of areas, and helping individuals identify the role that the environment plays in their well-being (Robinson, 2001).

Several researchers and practitioners have made individual and unique contributions to the development of the MBTI, among them being Ernst Kretschmer, Carl Gustav Jung, Isabel Myers, and David Keirsey. Studies have described personality in many ways down through the ages. With the focus on behaviorism in the first part of the twentieth century, the work of several great minds was almost lost. Isabel Myers and David Keirsey, working separately, revived and refigured the work into practical tools that described human behavior in similar ways (Isachsen & Berens, 1988).

Prior to the work of Myers and Keirsey, Carl Gustav Jung contributed greatly to the understanding of the human psyche. Unlike many of his contemporaries, his studies of human understanding were not purely from the point of view of Freud. Jung determined that the population was made up of two basic “types” of personalities. The extraverted was an object-oriented type and the introverted was an abstract type. From there he proceeded to look at the process of thinking and feeling, and of intuition and sensation. Jung’s significant and lasting contribution suggested that human typology could be reduced to the following: Extraverted-Thinking, Extraverted-Feeling, Extraverted-Sensing, Extraverted-Intuiting, Introverted-Thinking, Introverted-Feeling, Introverted-Sensing, and Introverted-Intuiting. Jung contributed to new ways of thinking about people and the way they handle themselves.
in various situations. His studies provided behavioral predictability, making it possible to more reasonably understand those who do not fit in our own mold or comfort zone (Isachsen & Berens, 1988).

A contemporary of Jung’s, Ernst Kretschmer, furthered understanding of the patterns of human behavior by describing a constitutional psychology that encompasses physical build, behavior under normal circumstances, and behavior under abnormal circumstances. He viewed people on a continuum as an integrated whole and as unique. However, he described two basic types, determining that individuals favored one or the other: the cyclothymic, who were practical, observed first, and whose functioning varied according to their mood; the schizothymes, who were somewhat removed from direct experiences, focused first on abstraction and sequence of thought, then on experience, and were capable of splitting their awareness and having abstract attitudes. Kretschmer broke each of these types down further into sub-types and believed this basic typology was the most decisive factor in determining differences among individuals (Isachsen & Berens, 1988).

Isabel Myers worked with her mother, Katharine Briggs, who had observed some basic human differences among people and formulated theories based on individual differences. The mother-daughter team worked together to develop new ways of thinking about individuals and their behaviors based on the theories of Jung. In the early 1940s, Briggs and Myers developed the tool that measured psychic functions and attitudes, allowing anyone to better understand herself or himself as well as others. The MBTI emerged as a method of comprehending, understanding, and eventually accepting differences in human behavior. The MBTI instrument is insightful and individuals gain understanding of the how
and why of diverse individual behavior; no amount of coaching, resolutions, or pronouncements will alter individuals in the long haul.

Jung primarily focused on psychic functions; Briggs and Myers refined the concept of attitudes. To further differentiate the types, they clarified the attitudes of perceiving versus judging. The MBTI provides insight into functions as well as attitudes. Every individual relies upon one rational function, either thinking or feeling, and one irrational function, either sensing or intuition. Thoughts and feelings can be controlled and directed at will; sensing and intuition appear to have a life of their own. Attitudes toward the outer world cause individuals who want structure to enjoy a sense of direction and goal setting; individuals who are the perceptive type and do not seek structure are content to flow with events as they happen. Attitudes toward interaction with the external world are manifested in extraversion or introversion: extraverts are energized in the presence of others, enjoying a great deal of satisfaction from involvement with other people; introverts are energized when alone, enjoying a rich inner life and sense of personal being as shown in Table 1 (Isachsen & Berens, 1998).

In 1956, David Keirsey started formulating an applicable and pragmatic “temperament theory” based on the work of Kretschmer. Keirsey studied the works of Jung and was aware of the Myers-Briggs Type Indicator. He designed an innovative and successful counselor training program that taught not only the theory behind therapy, but also taught what successful therapy involves. The concept of this theory was based how people are different and the patterns behind their behaviors. Keirsey unified the many descriptions of the four basic patterns of behavior that had been studied and identified underlying themes.
Table 1. Myers-Briggs Type Indicator

People attend to or take in data through:
Sensing (S) or, Intuition (N)

People process data and make decisions through:
Thinking (T) or, Feeling (F)

People have modes of meeting the world around them through:
Judgment (J) or, Perception (P)

People have attitudes toward others and are energized by:
Extraversion (E) or, Introversion (I)

The themes or core value of the type are emphasized. The four temperaments, described in terms of behavior patterns which are inborn are as follows: (1) Idealist value ethics and want to be authentic and whole; (2) Rationals value knowledge and competence and want mastery over nature; (3) Guardians value enculturation and civilization and want to have membership; and (4) Artisans value art and play and want to be free to choose the next act (Isachsen & Berens, 1998).

**Learning styles and Myers-Briggs Type Indicatator**

In an environment of the theories of behaviorism, Myers and Briggs provided an opportunity to apply insights and method that had not been addressed for many years. Students and teachers tended to be the natural forum for experimentation as they worked on theories and concepts. The mother-daughter team felt that if a person was to be free from his
or her own typo-centric view of the world, it is critical to know one’s own type. It follows that this knowledge would contribute to a genuine tolerance for individuals of another type (Isachsen & Berens, 1998). The self knowledge of an individual’s MBTI would augment the benefits of the knowledge of one’s learning style and together increase the appreciation for self and for diverse learners.

According to Isachsen and Berens (1998), ultimately, in the workplace motivation comes from within. The same could be said for the educational environment as well. Hence, if an environment is created where individuals are allowed and encouraged to be all they can be, they will be more satisfied and successful. When work is satisfying, meaningful, and enjoyable, people naturally strive to improve and perform better. In an environment that is filled with conflict, tension, and threat, individuals will be preoccupied with surviving and productivity or learning will suffer.

The premise behind MBTI and the appreciation of diverse learning is similar. As a result of knowledge and application of the concepts of typology and temperament, according to Isachsen and Berens (1998), people have gained four insights allowing them to function more efficiently:

All the conditions are present for things to be the way they are and no conditions are present for them to be different. Hence, they have come to accept people for who they are rather than being upset with the fact they are not molded into some other kind of personality.
Judging people from their own objective point of view is less productive than assisting them in their subjective realities. In other words, they have begun to manage people from the “inside out” as opposed to the “outside in.”
... They have become far more conscious of how people work and have thus abandoned attempts to manipulate situations in their favor. (p. 23)
As a result of the above, they no longer impose their personal values, beliefs, and norms on others. They have learned to suspend their own needs for expressing their point of view and opinion for the benefit of the people with whom they work.

For purposes of this study, it would be important to make a comparison between the MBTI and learning styles. The context for this discussion will be based on the following sources of information: (1) Job Description of the Brain, as described by Prashnig (1998) and shown in Table 2; (2) the six basic areas and their elements as described in the LSA, a learning style assessment tool developed by Prashnig (1998); and (3) Learning Styles Associated with Each Preference of MBTI (see Appendix B-1).

Table 2. Job description of the brain

<table>
<thead>
<tr>
<th>LEFT: ANALYTIC</th>
<th>RIGHT: HOLISTIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logical</td>
<td>Fantasy</td>
</tr>
<tr>
<td>Linear</td>
<td>Random</td>
</tr>
<tr>
<td>Sequential</td>
<td>Patterns</td>
</tr>
<tr>
<td>Analytic</td>
<td>Intuitive</td>
</tr>
<tr>
<td>Objective</td>
<td>Holistic</td>
</tr>
<tr>
<td>Literal</td>
<td>General</td>
</tr>
<tr>
<td>Structured</td>
<td>Integrated</td>
</tr>
</tbody>
</table>
The LSA assesses 49 individual elements in six areas; the first four areas appear to be genetically determined and the last two appear to be conditioned or learned:

1. **LEFT/RIGHT BRAIN DOMINANCE**: showing *sequential* or *simultaneous* brain processing strategies, *reflective* or *impulsive* thinking styles, overall *analytic* or *holistic/global* learning styles. This area relates to Table 2.

2. **SENSORY MODALITIES**: including *auditory* (hearing, talking, inner dialogue), *visual* (reading, seeing, visualizing), *tactile* (manipulating, touching), *kinesthetic* (doing, feeling) preferences.

3. **PHYSICAL NEEDS**: identifying needs for *mobility* (preference for moving or being stationary), *intake* (eating, nibbling, drinking, smoking), *time of day* (personal biorhythm) preferences.

4. **ENVIRONMENT**: revealing preference for *sound* (needing music/sound or wanting quiet), *light* (needing bright or dim lighting), *temperature* (needing cool or warm), *work area* (wanting formal or informal setting).

5. **SOCIAL GROUPINGS**: including preferences for working *alone*, in *pairs*, with *peers*, or on a *team*; and *authority* preference (wanting to learn with guidance or without).

6. **ATTITUDES**: showing *motivation* (internally or externally), *persistence* (high, low, fluctuating), *conformity* (conforming or non-conforming), *structure* (self-directed or needing guidance, directions), *variety* (needing routine/consistency or needing variety/change-oriented) (Dunn & Dunn, 1992, 1993; Prashnig, 1998).

Major similarities between the learning styles associated with each MBTI preference and the learning styles as described in the LSA tool and training are evident (see Appendix
B-1). The MBTI Extraversion (E) seems to include tendencies for auditory and kinesthetic, but not visual sensory modalities; the physical need is for mobility; the environmental preference is for sound or music; and likes to work in pairs, with peers, or on a team for social grouping. The Introversion (I) sensory modality indicates preference for visual; the environmental need is quiet; the social grouping indicates preference for working alone; and the need for clear lecture from the instructor indicates a usage of the left-brain. The MBTI Sensing (S) indicates a strong left-brain dominance, wanting information to be presented in logical and linear method and appears to be quite literal in thinking style; the sensory modality is tactile; the social groupings indicates a preference for an authority figure presence; and the attitudes show conforming and structure in the form of guidance as preferred. The Intuition (N) appears to be left-brained dominant with global insights and the use of fantasy and intuition; the sensory modality is kinesthetic; and the attitudes show internal motivation, non-conforming and self-directed structure. The preference Thinking (T) appears to be very left-brain dominant with specialization in logical, analytical, and objective ways of processing information; the sensory modality preference is kinesthetic and auditory (talking); the attitudes include conforming, and a need for structure. The MBTI Feeling (F) has tendencies for sensory modality of kinesthetic (wanting to feel or related to the material personally); the social groupings indicate preference for working in groups and with authority figures; and the attitudes include non-conforming, need for variety, and external motivation. Again, the Judging (J) appears to be left-brain dominant, appreciating structure and logical well laid-out plans; the social groupings includes preference for not needing authority figure for guidance and structure that is self-directed; attitudes showing preference for needing routine and consistency. The Perceiving (P) prefers processing
information with a right-brain dominance using fantasy, random, impulsive, intuitive, and holistic tendencies; the physical needs include preference for action and movement; and attitudes show external motivation and change-orientation or, in other words, the need for variety. MBTI and knowledge of learning styles used together will assist individuals in accepting and understanding self and others from their frame of reference and enable individuals to build on their strengths rather than agonize over their weaknesses (Isachsen & Berens, 1998).

Implications for Learning

If instructional approaches are sensitive to learning styles, most students can reach a higher level of learning (Claxton & Murrell, 1987). Since more and more students enter higher education with less preparation, they will require a great deal of assistance in order to achieve high academic goals (Artman & Gore, 1992; Bloom, 1976; Roueche & Roueche, 1993). It is the mission of the community college to provide open-door policies and to customize its services to the needs of the student. Skills are needed that improve study habits and strategies such as note-taking, test-taking, stress management, and critical thinking; these skills are learnable (Artman & Gore, 1992; Hsiao, 1992).

Learning styles and personality types are important tools for discovering how individuals process information and react to their environment. Both of these measures or assessments can provide valuable information to students and educators. Learning styles and other types of cognitive measures are essential for the community college in meeting its goals and mission. The MBTI instrument assists in the discovery of learning styles for students (Evans, 2000).
Howard Gardner looks for signs of personalization to indicate evidence of sensitivity to multiple intelligences in the school environment. Curricula, pedagogy, and assessment should be constructed to be responsive to individual differences, as personalized education is at the heart of the MI theory (Gardner, 1995). According to Gardner, if differences are recognized, knowledge of such differences is shared with the learner and materials are presented in ways that afford each learner maximum opportunity to master the materials.

As a result, learners gradually assume responsibility for their own learning. Students feel empowered and energized when they are able to take control of their own learning. Prashnig (1998) also states that using tools such as the Learning Style Analysis (LSA) enlighten students as to their preferred learning style and range of preferences, thus enabling them to teach themselves.

Thomas Armstrong (1994) states that the application of MI “can help us develop neglected intelligences, activate underdeveloped or paralyzed intelligences, and bring well-developed intelligences to even higher levels of proficiency” (p. 24). “Paralyzing experiences” was a term used by Armstrong to describe experiences that “shut down” intelligence. Shame, guilt, fear, anger, and other negative emotions act as “paralyzing experiences” that prevent our intelligences from growing and thriving (Zevik, cited in Kelder, 1994, p. 196).

For 50 years, Peter Drucker urged executives to focus on what people can do, not on what they can’t do. As a child, Drucker was encouraged by a progressive teacher to be responsible for his own learning. Each week he was given a notebook and was required to record his learning expectations for the week. At the end of each week, Drucker was instructed to compare his expectations to his results. Gardner’s theory of multiple
intelligences implicitly suggests this approach. *Learners should be encouraged to concentrate on their strengths and learn from their successes, versus concentrating on problems and mistakes* (Beatty, 1998).

Gardner (1994) believes that ultimately achievements are a result of genetic, cultural, and motivational factors. The importance of both nature and nurture must be acknowledged, as heredity is important, but the choices the learner makes and the effort the learner is willing to make have much to do with the culture in which the learner lives (Gardner). Gardner considers the relationship between multiple intelligences and diverse learning styles when he says:

... it is a principal assumption of this study that individuals are not all alike in their cognitive potentials and their intellectual styles, and that education can be more properly carried out if it is tailored to the abilities and needs of the particular individual involved. Indeed, the cost of trying to treat all individuals the same, or of trying to convey knowledge to individuals in ways uncongenial to their preferred modes of learning, may be great; if at all possible, it is advisable to devise methods for assessing the intellectual profiles of individuals. (p. 385)

Although much has been written about the learning process, brain-based learning, learning styles, and multiple intelligences, most studies and initiatives have focused on the responsibility of the educators to understand the diverse needs of the learner and to create an environment sensitive to individuals.

An idea beneficial for learners would be going beyond educators creating a learning environment conducive to diverse learners to encouraging learners to be responsible for their own learning. If individual learners identified their preferred learning styles and gained an understanding of the multiple intelligences and MBTI, they could become empowered
learners, responsible for their own learning, reduce feelings of inadequacy, and thus manage stress during their learning process.

Tools are available to assist individuals in assessing their preferred learning styles. The MBTI instrument assists individuals in discovering their learning style and personality type; the LSA assesses students in six areas of preferences with specific guidelines represented by 49 individual elements to gain insight into learning style preferences.

Summary

The literature review in Chapter 2 explored the learning process, brain-based learning, preferred learning styles, and implications for learning. The next chapter will outline in detail the research methods used in this case study.
CHAPTER 3. RESEARCH METHODS

Overview

This case study examined the changes in learning when individual learners gained knowledge of their preferred learning styles. What happens to the process of learning when the learning environment is conducive to successful and satisfactory learning? What happens when we move beyond traditional education practices with a strong emphasis on linguistic and mathematical skills? What happens when students understand themselves as learners?

Data collection and analysis relied on several different sources: pilot project student testimonies, student focus groups, faculty and student debriefing interviews, and feedback from class survey questions relating to Learning Style Analysis (LSA) tool and training. The overarching research questions that guided the study were:

1. What are the changes in learning when individual learners gain knowledge of their preferred learning styles?
2. What do students perceive as the outcome of the Learning Style Analysis (LSA) tool and training on their educational and personal lives?

The exploratory questions were:

a. As a result of the LSA tool and training, how, if at all, do learners feel empowered and responsible for their learning, thus, creating an environment conducive to successful and satisfactory learning?

b. How, if at all, has the LSA learning experience changed student grades?
c. How has the LSA learning experience affected student satisfaction with the educational experience?

d. Do students feel more or less stress with their academic experiences?

**Qualitative Research Approach and Rationale**

To determine the approach or research method to be used, the research paradigm, the purpose of the research, and the role of the researcher(s) must be determined. According to R. Usher (1996), paradigms are frameworks that guide scientific communities, define what problems or issues need to be addressed, and define acceptable techniques or theories to solve the problems or issues. Glesne (1999) explained the quantitative paradigm:

Quantitative methods are, in general, supported by the *positivist* paradigm, which characterizes the world as observable, measurable facts. Positivists assume a fixed, measurable reality exists external to people. In contrast, qualitative methods generally are supported by the *interpretivist* (also referred to as *constructivist*) paradigm, which portrays a world in which reality is socially constructed, complex, and ever-changing. The ontological belief for interpretivists, therefore, is that social realities are constructed by the participants in those social settings. To understand the nature of constructed realities, qualitative researchers interact and talk with participants about their perceptions. The researchers seek out the variety of perspectives; they do not try to reduce the multiple interpretations to a norm. (p. 4)

The quantitative paradigm also produces a kind of science that "silences too many" (Denzin & Lincoln, 1998, p. 10).

On the other hand, the qualitative paradigm provides opportunities for voices, especially voices with little power, to be heard providing a new way of understanding humans in society (Brotherson, 1994). Qualitative research refers to a point of view about reality as well as a method of gathering and analyzing situations. According to Krathwohl (1998), it is essential to note that an individual’s perceived reality is as important as the
objective reality. The *emic* view is often used to describe qualitative research, and proposes that through experiences we construct a world-view that determines our actions as well as our perceptions. When using the qualitative point of view it is important to understand "how the world looks to the people being studied and how those people act on that information" (p. 98).

Qualitative researchers often immerse themselves in a situation or area of interest, starting to gather data and information with an openness that does not impose a framework on the situation that determines what is important. Qualitative research is often appropriate when the researcher carries out the literature review after exposure to a situation, after ideas begin to form about what is important, after relationships begin to emerge, and after general explanations are beginning to advance (Krathwohl, 1998).

My experiences in education to date include teaching, reviewing literature, and providing training using the Myers-Briggs, Multiple Intelligence, LSA, and other development tools. These experiences have set the stage for immersion in a case study using the qualitative approach. As a result of these experiences, I have a passion for the need to appreciate diverse learning styles and the empowerment of lifelong learners. Using the qualitative approach and conducting a case study was appropriate to gaining knowledge of the perceptions of students and their faculty that have been involved in the LSA tool and training. It was important that all voices were heard and that the research reported a world that included the thoughts, values, and emotions of the learners themselves.
Background and Rationale for the Study

Essential to understanding the rationale for this study, is knowledge of the lives and experiences of the community student, as well as, the community college faculty. According to the American Association of Community Colleges’ (AACC) *Faces of the Future* report (VanDerLinden, 2002) community colleges serve a diverse set of learners; students use the community colleges to fulfill many goals simultaneously. There were six main reasons for enrolling in the community college outlined in the AACC report:

1. Upgrading Skills for Career Advancement (skill upgrader);
2. Career Preparation (career prep);
3. Major Life Change (life changer);
4. Personal Enrichment/Intellectual Development with Intent to Transfer (personal enrichment/transfer);
5. Transfer Only; and
6. No Definite Purpose for Enrolling.

The majority of the students were career prep (29%), personal enrichment/transfer (24%), or transfer only (21%). Thirty-nine percent of the career prep students were living with their parents, 39% were first-generation, and 9% were single parents. The personal enrichment/transfer category appeared to reflect a more traditional student population: Less than 10% had children; 57% lived with at least one parent; 49% relied on parental income to fund their education; 43% relied on financial aid; and 33% relied primarily on their own savings or income. Transfer only students included the fewest first-generation students (42% of skill upgraders were first-generation). In addition, the transfer only had the smallest
percentage of single parents (3.3%), 50% relied on parental income, and 37% indicated financial aid as a major source of funding (VanDerLinden, 2002).

Community colleges were found in general to fulfill the needs of the students using “one-stop shopping” and online student services to make necessary procedures convenient to all students’ populations. In addition to effective support services, students also count on community colleges to have flexible time and delivery of courses and to improve their life time skills and career opportunities. For example, 61% of the career prep students reported that the community college experience contributed to their acquisition of training and skills required for career opportunities. Nearly 40% of the skill upgraders and career prep students also relied on the community college experience to contribute to their communication skills in the workplace. The *Faces of the Future* study showed evidence that community college students rely on the college to contribute to their lives in many areas (VanDerLinden, 2002). The mission of community college includes responding effectively to the needs of the lifelong learner.

The other community college stakeholder key to the rationale behind this study is the faculty. The ideal community college faculty member is viewed often as a concerned, dedicated, and effective teacher. Community college faculties, in general, take pride in their commitment to teaching (Ratcliff, 1992) and often seek professional development opportunities that enhance the learning environment of the classroom.

According to McGrath and Spear (as cited in Ratcliff, Schwarz, & Ebbers, 1994), community college faculty members often have difficulty understanding their students, even though they describe themselves as professional teachers and educators. Teaching and student-centeredness are the priorities for two-year institution faculty, versus university
professors’ strong emphasis on scholarship and research. The career track for teachers of the traditional academic disciplines at community colleges consists of four to six introductory-level courses per semester taught every semester for many years. The downside to the emphasis on teaching is that community college faculty may become disengaged, and thus drift away from academic rigor and disciplinary concerns. A quotation from McGrath and Spear (as cited in Ratcliff et al., 1994) states the following:

The proudest claim of community colleges has always been that they are student-centered teaching institutions. As community colleges were largely shaped by this vision, so also their faculty members developed professional identities divorced from scholarship and disciplines, new identities as effective teachers, the vanguard of an instructional revolution. With this came a new notion of faculty development; the new profession was to be single-mindedly concerned with the improvement of instruction. In keeping with that orientation, the most common professional development activities at community colleges purport to help individual faculty members improve their teaching. (p. 361)

The administration of the community college in this case study has supported faculty participation in workshops and professional development centered on enhancing the learning environment and the classroom experience. The faculty members have embraced the idea of the community college as a learning college and, for the most part, take advantage of opportunities to enhance the learning environment of the classroom to serve the learner better. Because the community colleges were established in the sixties, there are many faculty members who are reaching retirement age. As the community college faculty members retire and new faculty are hired, increased opportunities for education and support of learner-centered concepts present themselves.

The mission of the community college in this study is as follows: “Provide quality lifelong learning and promote economic development for our communities.” To enhance
further the quality of lifelong learning, it was determined that the college should explore
going a step further than faculty enhancing the classroom learning environment and begin to
focus also on the role of students as lifelong learners.

Educators and learners need a method to ensure the understanding of multiple
intelligence, Myers-Briggs Type Indicator, and learning styles and what their implications
are for the individual learner. With this common method, all stakeholders can work together,
or as individuals, to create positive learning environments and develop an appreciation of
diversity in individual learning. The search for tools to communicate learning styles,
learning strengths, and areas of needed growth for individual students from the community
college in this study lead the college to Barbara Prashnig of New Zealand. Based on research
by Dunn and Dunn, Prashnig (1998) developed a tool and training centered on gaining
knowledge and appreciation for individual learning styles.

**Reliability of the LSA Tool**

The primary tool used in this case study is the LSA tool and training developed by
Prashnig and based on research by Dunn and Dunn (Prashnig, 1998). According to Dr. Ken
Dunn (as cited in Prashnig, 1998), thousands of students and adults have used the Dunns’
research to release personal learning power. Reliable results have been validated by research
in hundreds of colleges and universities and responses from more than three million children
and adults (Dunn & Dunn, 1993). Prashnig, a practioner, worked directly with Ken Dunn in
developing the basis for the Learning Style Analysis (LSA) tool and training, basing the LSA
on the work done previously by Dunn and Dunn (Prashnig, 1998). The Dunns’ Learning-
Style Inventory (LSI) (Dunn, Dunn, & Price, 1996) identified learning-style preferences for
adults. The LSI tool consists of 100 statements that elicit self-diagnostic responses on a five-point Likert scale and takes approximately 25 minutes to complete. The results indicate the preferred learning style based upon the Dunn and Dunn Model. The LSI has repeatedly evidenced predictive validity and has established impressive reliability and face construct reliability (Dunn & Dunn, 1990; Dunn, Bruno, Sklar, & Beaudry, 1990).

To validate the connection between Prashnig’s LSA tool and training and the research of Dunn & Dunn, the community college in this study communicated directly with Dr. Ken Dunn by telephone and email. Dr. Dunn sent a follow-up letter summarizing the discussion (see Appendix A-1). The first assessment instrument developed and completed in 1996 by Prashnig was the Working Style Analysis (WSA) and was derived from the original Dunn & Dunn Learning Style model. Based on the original Dunn & Dunn model and the WSA, separate LSA tools were developed for the primary, secondary, and adult learners (Prashnig, 1998). This study focused on the “LSA for Adult Learners” (see Appendix C-1).

Research has shown that individuals prefer to learn and concentrate in different ways, and learning is greatly enhanced when people can think, work, and concentrate in their preferred environment. An individual’s success is not only influenced by his or her intelligence or unique personality, but also by the physical space where one works or concentrates, by the type of interaction with other people, time of day, physical needs, and the learner’s frame of mind (Dellinger, 1989).

The Prashnig LSA tool assesses 49 individual elements in the following six basic areas:

1. *Left/right brain dominance* including sequential or simultaneous, reflective or impulsive, analytic or holistic/global;
2. Sensory modalities including auditory, visual, tactile, and kinesthetic;

3. Physical needs including mobility, intake, and time of day preferences;

4. Environment including sound, light, temperature, and work area preferences;

5. Social groupings including preferences in working alone, in pairs, with peers, or on a team and need for authority;

6. Attitudes showing motivation, persistence, conformity, structure, and variety needs (Prashnig, 1998).

The first four areas appear to be biologically or genetically determined and the last two areas appear to be conditioned or learned. By responding to the questionnaire containing a series of statements about themselves, learners receive a computer-generated personal profile LSA report that allows them to identify their individual strengths and personal preferences for learning, studying, reading, and general information intake. In addition, the LSA report gives a detailed explanation of the individual elements and how to capitalize on personal strengths and diminish the effects of individual weaknesses in learning, remembering, and problem solving (Prashnig, 1998). An important component of the LSA tool and training package developed by Prashnig was the follow-up training materials for the students to be used by trained college personnel to enhance students understanding of the LSA tool results (see Appendix C-2 and C-3). After extensive communication and training of selected staff by Prashnig, the community college in this study purchased the LSA tool and training. This case study provided an opportunity to research the LSA tool and training and to further validate the effectiveness of the LSA tool and training.
Pilot Project

Prior to implementing the use of the LSA tool and training college wide, the community college where this study took place conducted a pilot project to ensure that the LSA tool and training was effective and improved the learning skills of individual life long learners. While I was employed as administrator at the community college where the case study took place, the college initiated the pilot project that used the LSA tool and training.

The LSA tool is a comprehensive instrument giving detailed insight into various aspects of human behavior, thinking, and personal preferences. The LSA combines cognitive, biological, psychological, and social style aspects of learning. “The result is a very detailed description of the student’s preferences, flexibilities, and non-preferences during the learning process” (Prashnig, 1998). Small group follow-up informed college students of their unique styles, personal strengths, and effective use of feedback from the LSA tool. The follow-up was referred to as the LSA training. Skill building sessions were offered by the college for those students wishing to improve knowledge and application of learning skills further.

The purpose of the pilot project was to discover whether self-knowledge, specifically, the use of the LSA tool and training, would improve the student’s grades, reduce frustration, and encourage each student to take responsibility for his or her learning environment. After a successful pilot project, the goal was to have all full-time students enrolled at the college complete the LSA tool and training in order to ensure a better understanding of their individual learning styles, empower their learning by gaining skills to create a positive learning environment, and learn to take responsibility for their learning.
The college faculty and administrators commenced a college-wide initiative the following fall using similar guidelines for all new, full-time students entering the college. The LSA tool and training was eventually included in a newly designed one-credit course, Successful Learning, required for all incoming full-time Arts and Sciences students and in required program courses chosen by the coordinators of all Career Option and Vocational/Technical programs.

Participation by faculty in the LSA tool and training initiative was optional for two reasons. First, if a faculty member were resistant to the idea, it would cast a negative shadow over the initiative. If a faculty member were an effective “sage on the stage,” the college determined that it would be prudent to let that faculty member continue in the manner he or she had found to be successful, if that is what the faculty member chose to do. Negativism by skeptics would have caused avoidance, anxiety, and blocked learning of the methods and tools to apply to the classroom. Second, if all the classes for all courses at the college were transformed into innovative learning environments that contained strategies sensitive to diverse learners, it would not empower the individual student to learn strategies to adapt the environment. At some point, when students transferred or were employed, they would find themselves in “hostile environments” and not have the tools or skills to adapt their learning environments to those conducive to their individual needs.

The pilot project was deemed a success by the community college in this study. Students and staff who had participated in the pilot project presented the results to the Board of Trustees in March 2001. The college administration determined that the LSA tool and training initiative was to be implemented college-wide for all new full-time students, beginning Fall 2001. This pilot project became an integral part of this case study in two
specific ways. First, the successful results of the pilot project, and more specifically the testimonies of the students at the Board of Trustees meeting, were important to the design of this research. Second, two of the student testimonies were used as data sources in the analysis and results stage of this case study.

**Research Design**

The four stages of the case study method as recommended by Yin (1994) were used for this research study. The stages include: (1) designing the case study; (2) conducting the case study; (3) analyzing the case study evidence; and (4) developing the conclusions, recommendations, and implications. While conducting the case study, six primary and secondary sources of data were used: documentation, archival records, focus groups and interviews, direct observation, participant observation, and physical artifacts (Yin, 1994).

According to Tellis (1997), case studies are considered intrinsic when the researcher has an interest in the case and tends to be selective, focusing on one or two issues. In this study, the focus was on the perception of the community college students and faculty who had participated in the LSA tool and training. The points of view of the students, as well as the faculty, and the interaction between them were considered in this case study (Tellis, 1997).

The presentation made to the community college Board of Trustees in the spring following the LSA tool and training pilot project included testimonials from two college students and a middle-school student and his parent. I reviewed the two college student testimonials’ and used their reactions as I designed, formulated, conducted, analyzed, and developed conclusions for this case study. In addition, I conducted student focus groups, a
student peer debriefer interview, and faculty peer debriefer interviews. The students had participated in the college-wide LSA tool and training initiative and the faculty members had observed and worked with these students.

Focus groups were chosen for the students who had participated in the LSA tool and training because the unique features of focus groups created safe environments where students could share their thoughts openly. Interactive focus group interviews can lead to understanding attitudes, behaviors, and contexts from many points of view (Patton, 1990). Because of the design of focus group interviews, they elicit multiple perspectives and are suited to address questions that inform or assess policy and practice (Brotherson & Goldstein, 1992a). Focus groups are very similar to group interviews; however, they capitalize on group interaction to gain data and insights that would otherwise be less attainable (Krueger, 1988).

Because of the subjective nature of this case study, focus groups and interviews with open-ended questions were used in a partially-structured and semi-structured environment. The process was conducted in both directive and nondirective manners, beginning with open-ended questions, moving into topic-specific questions as needed. Each focus group or interview ended with an open-ended question allowing for comments or input that had not been previously addressed during the session. Questions were formulated beforehand, with a planned sequence. However, I used a nondirective approach to probe for more information and feedback, and changed the order of the questions as appropriate to enhance the discussion and responses from respondents. As the data were collected and analyzed for the student focus groups, the initial data were used to guide the collection and interpretation of subsequent data at the peer debriefer interviews (Lincoln & Guba, 1985). The information
gathered from the pilot project testimonies was used to develop the research questions and subsequent student focus group questions; the information from the focus groups was used to guide and focus the faculty peer debriefing interviews and the student peer debriefing interview (Fontana & Frey, 1994).

Gaining Access

The President of the rural Midwestern community college had granted permission for me to gain access to the students, faculty, and records needed to conduct my research. He felt that the information gained from the research study would be useful to the rural community college in the case study for purposes of evaluating and determining future plans for the LSA tool and training. The President delegated the responsibility of contact person to the Chief Academic Officer (CAO); the CAO delegated the role of liaison to the campus Dean. The Vice President of Administration worked with the CAO and campus Dean to determine the policy and procedures to be followed by researchers having access to college students, personnel, and records. The administrative team determined that participants should be selected on a voluntary basis only; names of students participating in the LSA tool & training could not be given out for the purposes of research. The campus Dean recommended that I make direct contact to students through daily announcements, asking for volunteers to participate in a study being conducted by an Iowa State University graduate student (see Appendix A-2). The dean edited and approved the wording of the notice. In addition, at the request of a faculty, I designed and emailed a notice for potential student participants to faculty who had agreed to hand the notices directly to students (see Appendix
A-3). This solicitation did not work effectively and as researcher, I attempted to wait patiently to allow the plan time to work. Notices were posted twice with no response.

It was at a retirement party for a former colleague that a faculty member inquired about the status of my research. He recommended that I attend a meeting with Successful Learning faculty and explain my research questions and proposal, as the Successful Learning course delivered the LSA tool and training to the Arts and Sciences students at the college. The meeting was scheduled for the next month during professional development week prior to the beginning of the spring semester. I discussed this idea with the CAO, who agreed that it would be a viable alternative to gain access to students. The campus Dean position was in transition, with the interim dean completing responsibilities at the end of the fall semester and the newly appointed dean arriving at the beginning of the spring semester after the holiday break.

Attendance at this meeting resulted in the identification of faculty and student participants by snowball sampling and status sampling strategies (Dobbert, 1982; Krathwohl, 1998). Snowball sampling is identification of members of a specific group by asking for referrals from individuals who are members of the group or would be expected to be able to identify members of a group (Krathwohl, 1998). The students were identified using both status sampling and snowball sampling; the faculty members were identified using status sampling. Arts and Sciences faculty from the Successful Learning course volunteered to identify students and give me their email addresses. I emailed the letter of invitation to these students (see Appendix A-4). Initially, response was minimal. However, the initial participants identified were Arts and Sciences students recommended by faculty from the Successful Learning course.
I still needed student participants from the Career Option and Vocational/Technical programs. I contacted my former colleague, who was a coordinator for a program that had a career option track and a vocational technical track, as she had been serving as a peer debriefer at various stages of the planning of my research project. She volunteered her seminar class as a focus group. Another colleague, who taught Introduction to Education, volunteered her Arts and Sciences class as a focus group. Another round of emails went out to the students who had been referred by faculty and who had shown an interest, inviting them to join one of the two newly scheduled focus groups.

As mentioned previously, snowball sampling is identification of participants based on referrals. Faculty participants identified students for me to contact; faculty participants contacted students directly and asked them to participate; student participants identified other students who participated. Therefore, snowball sampling, also known as chain referral sampling, was used to identify the remainder of the student participants (Krathwohl, 1998).

Status sampling refers to involvement by those who, by their roles and responsibilities, have knowledge and perspectives on the research phenomena. The students from the seminar class and the Introduction to Education class were identified by their instructors and used for this study because of their direct involvement with the LSA tool and training. When it came time to schedule faculty peer debriefing interviews, Successful Learning faculty members agreed to participate, as did the two instructors who had volunteered to let me use their class time for my student focus groups. The faculty members were eager to participate and generous with their time.
Participant Selection and Description

Selection of the participants can be either random or purposive, depending on the goal of the research. Samples for qualitative case studies may be based on extreme cases, cases that illustrate the greatest variety of variables, typical cases that represent the phenomenon, or cases that confirm or disprove a hypothesis. Key participants in this study were 27 students who have been involved with the LSA tool and training at the small, rural community college. In addition, six faculty members and one colleague served as peer debriefers and/or recorders to enrich the research design and perceptions shared by the students. Feedback from arts & science students and faculty members involved in a Successful Learning course that included the LSA tool and training were used as a secondary data source. The two student testimonies, from the presentation to the Board of Trustees on the original pilot project at the college in this study, were used to enrich the research design, the research questions, and the focus group questions. The pilot project included full-time students enrolled at the rural Midwestern community college that took the LSA tool and had a minimum of one hour of follow-up training.

The original intent was to have two student focus groups consisting of six to ten students chosen to represent homogeneous groups from the college-wide initiative in the fall semester 2001 and 2002 and one faculty group to interview as follow-up to enrich the study by enhancing credibility and confirmability. According to Glesne (1999), random sampling is used for quantitative research when large, statistically representative samples are needed. However, "qualitative researchers neither work with populations large enough to make random sampling meaningful, nor is their purpose that of producing generalizations" (p 28). Therefore, participants were chosen with purposive sampling to represent traditional and
nontraditional students from the disciplines of Arts and Sciences, Career Option, and Vocational/Technical, as well as faculty members who worked with students completing the LSA tool and training.

In actuality, both status sampling and snowball sampling research strategies were also used to identify the participants in this study (Dobbert, 1982; Krathwohl, 1998). The faculty participants utilized as peer debriefers, field note recorders, or filled out Focus Group Worksheet Analysis forms (see Appendix B-2) were identified using status sampling. They had either volunteered as a result of my presentation at the Successful Learning course or they were contacted directly by me, because of their involvement or close association with the LSA tool and training and my research.

Eventually, after the daily announcement attempts failed to secure volunteers, the student participants were selected using snowball sampling and status sampling strategies with the assistance of the faculty members from the Successful Learning course. As mentioned earlier, the administrators at the community college determined that participation should be totally voluntary and should be solicited through the daily announcements (see Appendix A-2), which did not result in any leads or volunteers for the student focus groups. After attending the Successful Learning course faculty meeting and with the approval of the CAO, faculty members volunteered names and email addresses of Arts and Sciences students that they felt would be candid about their experiences with the LSA tool and training. An email letter of invitation (see Appendix A-4) to participate resulted in a limited number of students responding in the affirmative; however, the students responding asked if another time would be possible as the suggested times in the letter were not convenient.
Concurrently, I discussed the need to have Career Option and Vocational/Technical students represented in my research, with my former colleague serving as peer debriefer; she volunteered her students and class time. Because of the limited number of Arts and Sciences students committed, I contacted the faculty member who taught Introduction to Education for Arts and Sciences transfer students; she volunteered her students and class time. I now had times and locations secured for two focus groups. Emails were again sent to potential student participants who had been recommended by faculty or students with an invitation to attend one of the two newly scheduled focus groups. In addition, the volunteer faculty members were notified so that they could pass the new time and location on to students that they had secured for focus groups.

It was not until later that I learned that the Introduction to Education course was broadcast to five sites with two-way audio and video capabilities. Fortunately, I was comfortable with the technology as I had previously used this system to give presentations and to conduct college-wide meetings. As researcher, I was now challenged to conduct a meaningful focus group discussion using distance education techniques.

A total of 34 research participants were involved in the study: students (27), faculty (6), and colleague (1). The participants served in various and multiple capacities.

**Student participants**

The students' roles in the research and focus groups included the following: participants in focus groups discussions (23); focus group student recorders (4); focus group member checkers (4); focus group analysis worksheets completers (3); and peer debriefer interviewee (1).
Focus Group 1

A total of eight students participated in the focus group discussion and one student served as student recorder and member checker at the end of the discussion. At the completion of the focus group, this student recorder also requested an opportunity to visit with me again, as he felt he was unable to contribute to the discussion and wanted to share his impressions of the LSA tool and training. He agreed to complete and turn in a focus group analysis worksheet, which he did within approximately one week, indicating that he had provided his point of view versus an analysis of the focus group discussion. In addition, due to his enthusiasm and rich experiences, he was included when I returned to campus to conduct faculty peer debriefing interviews of the emerging themes from the focus groups. Three of the students were walk-ins that faculty had encouraged to participate; six were members of the scheduled class; three were Arts and Sciences students; six were Career Option or Vocational Technical students as shown in Table 3. The focus group lasted just under one hour.

Focus Group 2

The second focus group consisted of eighteen students at four sites (the course was televised to five college locations; however, the fifth location had only one student who had not taken the LSA tool and training and merely observed the focus group). Fifteen students participated in the discussion from the other four locations. All but one of the students in Focus Group #2 were Arts and Sciences students; several planned to transfer for elementary or secondary education; one indicated enrollment in the Criminal Justice Program (career
option). The course faculty recommended the students who served as recorders and member checkers.

*Site One* (8) had seven participate in the discussion and one serve as focus group student recorder, member checker, and analysis worksheet completer. *Site Two* (6) had five participate in the discussion and one serve as focus group student recorder, member checker, and analysis worksheet completer. Four students at location 2 had not taken the LSA tool and training and therefore observed the focus group discussion. *Site Three* (2) had one participate in the discussion and one serve as focus group student recorder and member checker. The student recorder at location 3 had not participated in the LSA tool and training; neither had four other students who observed the focus group as shown in Table 3. *Site Four* (2) had two students participate in the discussion and no student recorder; their responses were recorded by the field note recorder at the origination site.

The origination site for the televised course was at location two. Therefore, I facilitated from location two and my colleague served as focus group field note recorder and ran the tape recorder from location two. The Introduction to Education course faculty served as field note recorder for location one and ran a second tape recorder from that location also. In addition, a video recording of the course included all five locations. The second focus group lasted approximately 90 minutes.

The student participants, as shown in Table 3, provided invaluable support for this study and enriched the results by participating in a variety of roles. The informed consent statement was reviewed with all the participants at the beginning of the focus groups; all students contributing to the discussion signed the form to indicate their understanding of their rights as participants in this study (see Appendix A-5).
Table 3. Participant roles: Students

<table>
<thead>
<tr>
<th>Focus Group</th>
<th>Discussions</th>
<th>Focus Group Recorder</th>
<th>Focus Group Member Checker</th>
<th>Focus Group Analyst Worksheet Completer</th>
<th>Peer Debriefing Interviewee</th>
<th>Arts and Science</th>
<th>Career Option or Vocational Tech.</th>
<th>Male or Female</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Focus Group 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>-</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>-</td>
<td>M</td>
</tr>
<tr>
<td>B</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>M</td>
</tr>
<tr>
<td>C</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>F</td>
</tr>
<tr>
<td>D</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>✓</td>
<td>-</td>
<td>M</td>
</tr>
<tr>
<td>E</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>F</td>
</tr>
<tr>
<td>F</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>F</td>
</tr>
<tr>
<td>G</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>✓</td>
<td>-</td>
<td>M</td>
</tr>
<tr>
<td>H</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>✓</td>
<td>-</td>
<td>M</td>
</tr>
<tr>
<td>I</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>✓</td>
<td>-</td>
<td>F</td>
</tr>
<tr>
<td><strong>Focus Group 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>-</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>-</td>
<td>F</td>
</tr>
<tr>
<td>K</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>F</td>
</tr>
<tr>
<td>L</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>M</td>
</tr>
<tr>
<td>M</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>F</td>
</tr>
<tr>
<td>N</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>✓</td>
<td>-</td>
<td>M</td>
</tr>
<tr>
<td>O</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>F</td>
</tr>
<tr>
<td>P</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>F</td>
</tr>
<tr>
<td>Q</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>F</td>
</tr>
<tr>
<td><strong>Focus Group 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>-</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>-</td>
<td>M</td>
</tr>
<tr>
<td>S</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>F</td>
</tr>
<tr>
<td>T</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>M</td>
</tr>
<tr>
<td>U</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>F</td>
</tr>
<tr>
<td>V</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>F</td>
</tr>
<tr>
<td>W</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>F</td>
</tr>
<tr>
<td><strong>Focus Group 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X*</td>
<td>-</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>-</td>
<td>F</td>
</tr>
<tr>
<td>Y</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>M</td>
</tr>
<tr>
<td><strong>Focus Group 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>F</td>
</tr>
<tr>
<td>AA</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>F</td>
</tr>
</tbody>
</table>

* Note student recorder X had not participated in LSA tool and training.
Colleague and faculty participants

The colleague and faculty members’ roles included peer debriefer for designing the case study (3), focus group field note recorder (2), focus group analysis worksheet completer (2), and peer debriefer interviewee (5). My colleague served as peer debriefer for the design of the focus groups, focus group field note recorder, and focus group analysis worksheet completer, and ran the tape recorder at both focus groups. Two faculty members from the community college where the study took place were former colleagues of mine and served as peer debriefers for the various phases throughout the research design, as well as participated as peer debriefer interviewees. One of these faculty members was the Success Center instructor and provided me with the data from the Successful Learning course evaluation questions that pertained to the LSA tool and training. The other faculty was a coordinator of a program with two tracks: (1) Career Option track, and (2) Vocational and Technical track. Three additional faculty volunteers from the community college participated in the peer debriefer interviews. One faculty member served as focus group field note recorder for location one during the second focus group and completed a focus group analysis worksheet on the discussion from the same location for the purpose of enriching my research results. All of the faculty participants encouraged students to participate in the focus groups or provided me with names of students to contact. Five of the six faculty members from the community college participated in the peer debriefer interviews, as shown in Table 4.

The colleague and faculty participants involved provided rich and meaningful data as a result of the experiences they brought to this study. The faculty participants are employed
Table 4. Participant roles: Colleague and faculty members

<table>
<thead>
<tr>
<th></th>
<th>Peer Debrief for Research Design</th>
<th>Focus Group Field Notes Recorder</th>
<th>Focus Group Analysis Worksheet Completers</th>
<th>Peer Debriefing Interviewee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colleague</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Faculty</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B*</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Note: Faculty B also served as resource for records and documents.

by the community college in this study. Below is a brief biography of each, including their direct involvement with the LSA tool and training:

*Colleague A* was a graduate research assistant at the university, where I served in the same role. She has extensive experience in conducting and analyzing focus groups.

*Faculty B* was a full-time instructor at the community college Success Center. Her job description includes 25% time for planning, coordinating, and evaluating the internal college-wide LSA tool and training initiative. This responsibility includes coordinating and facilitating the college-wide Returning Results sessions for the students completing the LSA tool as well as facilitating the two-hour Discovery Sessions for faculty interested in knowing more about the LSA tool and training. In addition, Faculty B coordinates the Successful
Learning course and curriculum, designs the evaluation tools, analyzes the data, and prepares the reports.

*Faculty C* served as the Coordinator and a faculty member for a program with dual tracks, the Career Option track and the Vocational Technical track. Faculty C also serves as a student advisor, participates in the LSA tool and training Returning Results sessions, and attended the Faculty Discovery Session.

*Faculty D* was a part-time Success Center instructor. A retired middle-school science teacher, Faculty D is director of the college’s middle-school academic summer camp (which incorporates the Primary LSA tool and training), and she is also an instructor for the Successful Learning course.

*Faculty E* was an Arts and Sciences faculty member, student advisor, and Successful Learning course instructor. Faculty E participated in Prashnig’s two-day LSA tool and training and the Faculty Discovery Session.

*Faculty F* was an Arts and Sciences faculty member, student advisor, and Successful Learning course instructor. In addition, Faculty F participated in the Faculty Discovery Session and the two-day training by Prashnig.

*Faculty G* was coordinator of secondary programs and instructor of the Introduction to Education course.

My colleague and several faculty members, as shown in Table 4, provided rich data for this study by participating in a variety of roles such as peer debriefers, field note recorders, analysis worksheet completers, and peer debriefing interviewees. The informed consent statement was reviewed with each faculty peer debriefer at the beginning of the
interviews. All faculty members signed the form to affirm their understanding of their rights as participants in this study.

Researcher Role

According to Stake (1995), the qualitative researcher may assume many roles: teacher, participant observer, interviewer, reader, storyteller, advocate, artist, counselor, evaluator, consultant, and others. The role of interpreter and gatherer of interpretations is central. The qualitative researcher may conceive of three realities: the first reality is external and capable of stimulating us in simple ways; the second reality is formed by the interpretations of the simple stimulation; the third reality is a universe of integrated interpretations, our rational reality. The aim of research was not to discover the first, but to construct a clearer second reality, and a more sophisticated third reality (Stake).

This researcher acknowledges that she brought biases to this study. For this study, I served as researcher, interviewer, evaluator, and analyst of the data, thus reconstructing the participants' stories. While employed at the small, rural community college in this study, I was extensively involved in the search for a process to help each individual learner optimize learning. Ultimately, the search led to the evaluation and acquisition of the LSA tool and training. Prior to this study, I had been involved in extensive training of the LSA, had presented to the students the Returning Results sessions designed to explain and facilitate understanding of individual results to students at the community college, had presented two-hour Discovery Sessions to interested faculty members, and had presented one-hour sessions on Knowing Your Style at other colleges and conferences. I had witnessed the emotional response of students as they discovered their individual learning styles and began to
appreciate the diversity of individual learners. According to LeCompte and Preissle (1993), a researcher must openly express individual bias and understand his or her impact on the study:

The roles the researcher assumes within the culture and the researcher’s identity and experience are critical to the scientific merit of the study. They are part of the research design because researchers are dependent on and involved with participants over a sustained period of time and in ways far more intimate and complex than simply filling out questionnaires. ... To the extent that they become a part of the community and have the same experiences as natives do, the quality of their data is improved. (p. 92)

My aim as researcher was to listen to and reconstruct the experiences of the students as they share their realities of their roles within the context of the LSA tool and training. In addition, the goal was to determine if the LSA tool and training change the students’ perceptions of the learning process, given the theories discussed in the literature review and the qualitative research of this study. Specifically, I wanted answers to the following questions concerning the LSA tool and training: Is it helpful to lifelong learners at a small, rural Midwestern community college? As a result of the LSA tool and training, do they feel empowered and responsible for their learning? Have their grades improved, and has their satisfaction with learning improved? Do they feel less stress?

**My Background and Beliefs**

I must begin by sharing my experiences that are the setting for my personal agenda and biases. I was fortunate to come from a family that values education. When my mother was asked by a friend why I needed an MBA if I was going to live in Bancroft, Iowa, my mother replied: “Because she lives in Bancroft, Iowa, it is even more important for her to finish her MBA. Then she can take advantage of any opportunity that becomes available.”
When relating the story to me, my mother added: “You will never regret more education.”

The greatest influence was my father, who grew up on a “dirt farm” in Kansas during the Depression and made many sacrifices to earn his Ph.D. in mathematics from the University of Iowa. His philosophy was that two kinds of teachers exist in the world—those teachers who put up barriers and only the student who figures out how to get over them is successful, and those teachers who teach the student how to get over, under, or around the barriers. My father spent the greatest portion of his career as a faculty member and administrator at the University of South Dakota, and taught many students how to get over, under, and around barriers.

Another life experience that had an impact on me had to do with learning and the transfer of knowledge. My educational experience as an undergraduate was very quantitative in nature. My K-12 experience was during a phase when memorization was downplayed. An example was the curriculum Modern Math Through Discovery, which did not emphasize the memorization of facts. In fact, we never did memorize the multiplication tables; we simply had to understand that eight sets of six were one more than seven sets of six. To this day, for me, adding and multiplying simple computations are better done on the calculator.

My study partner at the University of South Dakota during my MBA experience had just completed undergraduate studies in history. She was as great at memorizing as I was at analysis and logic. She taught me strategies for memorizing. At age 32, I began to believe that I could memorize. One night as we were hashing and rehashing our notes, tying it to the lecture and text, in frustration I stated that many of our classmates were out having a beer by this time. She looked at me calmly and said, “Yes, Ellengray, but we are lucky, because we know that if we work at it we can eventually get it. Not everyone can say that.”
statement had a great impact on me as an educator. I have never forgotten that everyone learns in a unique and individual way. *Lifelong learners can be taught strategies that reduce frustration and facilitate the learning process.*

Strategies for learning can be taught and applied through self-awareness. My philosophy on education continued to formulate while working with middle-school students for two years as a science teacher. I observed that what we called the top students did well in the traditional classroom setting, while other students became leaders when we went to the science laboratory and learning was hands-on. It frustrated me to have the traditional learners leave the class every week for the Talented and Gifted program, knowing that the students left behind were the ones who needed the hands-on experiences to enhance their learning. My outlook continued to be shaped by my experiences in my graduate programs of study, as well as my personal and professional experiences. Again, I will not forget the feeling of intimidation and frustration at having to take the GRE. It had been years since I had studied mathematics basics and the time to review was hard to come by. However, more importantly to me was what if I “failed”? Students and lifelong learners across the country feel this sense of inadequacy every day.

The mission of the community college where I worked included a dedication to lifelong learners. One of the college campuses included Arts and Sciences, Career Option, and Vocational/Technical programs, as well athletics, fine arts, and housing. As Executive Dean of this campus, my responsibilities were to provide for all student, faculty, and personnel needs, as well as coordinate all activities and budgets for the campus. At the same time, I was responsible for Chief Academic Officer (CAO) duties for the entire college and for implementing the Academic Structure that was adopted just prior to my assignment. The
Academic Structure was composed of four faculty driven committees: Curriculum, Assessment, Policies and Standards, and Academic Review. The Academic Council was composed of faculty and administrators and reviewed all proposals that had been discussed and recommended on the committee level; the CAO acted as facilitator. The Academic Council could send recommended items back to the same or another committee for further discussion and investigation, pass the motion, or deny the motion. My responsibilities included ensuring that administrators, staff, and faculty throughout the entire college used the process and did not make decisions prior to discussion, action, and recommendations from the faculty-driven academic structure.

As I moved through my doctoral program of study, I found myself applying learned strategies to empower faculty and staff that were dedicated to serving students. This empowerment was beneficial as we planned, evaluated, adopted, implemented, and assessed the LSA tool and training. We determined early on that the goal was to have the LSA tool and training mandatory for all new full-time students entering the community college. A second goal was to teach students learning strategies to empower them to be more effective and successful lifelong learners. One of the objectives was to give students the tools to create a positive learning environment for themselves. While processing and assimilating all these experiences, I began to develop a clear vision of what needed to be done to create safe learning environments that empowered learners.

In addition, discussion in a qualitative research course, Dr. Mary Jane Brotherson’s HDFS 604 “Advanced Qualitative Research Methods,” revealed that qualitative research is an ongoing process that changes as the researchers immerse themselves in the research. Understanding the flow of ideas that takes place in the statement of the problem is important.
One chooses a subject area, a research problem to be solved, finds evidence from literature and practical experience, determines what is missing in the evidence, and addresses the audience that the research will serve. This is in contrast to the quantitative positivist point of view. Positivists believe that a real world exists independent of thoughts, values, and emotions. In other words, a universal truth exists and researchers remain rational and objective throughout the process. In addition, if appropriate methods are used, then the quantitative researcher can claim that the result of the research is truth and can be generalized to a larger population.

This class discussion had an impact on me as a researcher and affirmed that qualitative research was appropriate for this research topic in that there is no one truth. The voice of each diverse learner and the learner’s perception of the effect of knowledge of the individual learning style on the lifelong learning process are important. This researcher believes that individuals can be empowered to take responsibility for their own learning!

Data Collection

Data collection for qualitative research may take many forms; the most widely used types include observation and interviewing. Observation methods can be described best on a continuum ranging from covert participant observer to non-participant observer. For this study, the most appropriate form of observation was unconcealed participant observation, wherein observations were recorded in sight of the observed (Krathwohl, 1998).

Creswell (1998) agrees that interviewing and observing issues are the most common forms of data collection used in the case study method. He noted the importance of using
multiple sources. Glesne (1999) also noted the importance of using multiple methods of data collection to increase confidence in the findings.

This study reviewed various documents, including the LSA for Adult Learners (see Appendix C-1) and the LSA tool and training material used in the Returning Results training for students and the Discovery Sessions for faculty, the testimonies of students from the pilot project, and the survey results of the Successful Learning course that facilitates the LSA tool and training for the Arts and Sciences students. The review of the first two secondary sources was used in the design stage of the case study; the review of the second two was used in the design stage, the analyzing the case study evidence stage, and developing the conclusion, recommendations, and implication stage. The transcriptions of the student focus groups and the faculty peer debriefer interviews also added dimension to the field notes by serving as primary data sources.

Focus groups

The two student focus groups were held on January 21, 2003, at 9:00 a.m. and at 3:00 p.m., three months after the daily announcements included the first notice for volunteers. The focus groups and interviews were conducted on the campuses of the rural Midwestern community college at a location and time convenient for the participants. Each focus group met one time for approximately one to one and one-half hours.

Student recorders wrote key phrases on the white board; field note recorders recorded the details of the discussion of the focus groups, noting actions and interactions, while I served as facilitator. The field notes included direct observation, participant observation, and physical artifacts. Audio tape recordings and/or videotapes ensured that details of the
discussion were accurate. A checklist for focus group interviews was used to ensure that the facilitator followed effective processes throughout the planning and implementation (see Appendix B-3). The checklist included suggestions for advance notice, questions, logistics, moderator skills, and what to do immediately following the session (Krueger & Casey, 2000).

Copies of focus group questions were available for students who preferred to have a visual copy of the semi-structured discussion (see Appendix B-4). A thank-you note at each participant’s location included the definition of a focus group and the two open-ended focus group questions (see Appendix A-6).

The initial focus group questions were developed over time, with many revisions, as it was vital that the questions related to the purpose of the study and the overarching research questions. The purpose of this study was to determine if students can learn strategies that enhance their ability to learn, reduce intimidation and thus manage stress during the learning process in order to maximize learning potential. The overarching research questions were as follows:

1. What are the changes in learning when individual learners gain knowledge of their preferred learning styles?
2. What do students perceive as the outcome of the Learning Style Analysis (LSA) tool and training on their educational and personal lives?

The exploratory questions are as follows:

a. As a result of the LSA tool and training, how, if at all, do learners feel empowered and responsible for their learning, thus, creating an environment conducive to successful and satisfactory learning?
b. How, if at all, has the LSA learning experience changed student grades?

c. How has the LSA learning experience affected student satisfaction with the educational experience?

d. Do students feel more or less stress with their academic experiences?

As previously noted, the focus group interviews were partially-structured and semi-structured. The questions were directed in both a directive and nondirective manner. The initial open-ended focus group questions that began the focus group discussions were as follows:

1. How, if at all, has the LSA experience impacted you? Tell me about it.

2. What changes, if any, has the LSA had on your academic experience?

The following topic-specific questions were also used as appropriate to facilitate discussion:

3. In what ways, if at all, do you use the knowledge gained by the LSA tool and training to create a positive learning environment for yourself?

4. Could you describe for me what, if any, study strategies or techniques you have adopted since using the LSA?

5. Could you describe for me how your satisfaction with learning has changed since receiving the LSA tool and training?

6. What were your expectations today? Is there anything else you would like to share?

As previously mentioned, the second focus group was televised to five locations. To ensure that the experience was consistent for all participants at all sites during the second focus group, my colleague and I traveled to, and delivered materials and instructions to, the proctors at four of the five sites over the course of three hours. During this time, the discussion with my colleague as to “what went well” and “what could be changed” based on
the first focus group experience was invaluable. During the first focus groups two major issues became apparent: (1) a review of the LSA elements was needed half way through the discussion; and (2) several participants commented that the LSA tool and training reflected their learning styles accurately.

As a result of this discussion and the added logistics of participants at four locations, the order of the questions as outlined above were more closely followed for the second focus group. I also decided to review elements of the LSA tool first and have the participants at all broadcast locations introduce themselves, telling us when they had taken the LSA tool and training and what they had learned about themselves as a result. Following this, we began the focus group questions. In addition, three questions were added to the end of the second focus group in place of number 4 of the original topic-specific questions:

1. Did the LSA tool accurately reflect your learning style?
2. Did you take advantage of the follow-up sessions offered by the college?
3. Is there anything else we should have asked you today?

**Interviews**

The faculty peer debriefer interviews were arranged for the purpose of verifying the themes emerging from the student focus groups (see Appendix A-7). The faculty members from the Successful Learning course and the faculty members volunteering their course for the focus groups were contacted by email and volunteers were secured. The student serving as recorder and member checker from the 9:00 a.m. focus group was also contacted, due to his extreme interest in the LSA tool and training. A peer debriefing interview was scheduled
with him to review findings of the focus groups. The peer debriefing interviews were held on March 4, 2003, six weeks after the student focus groups.

As mentioned previously, five faculty members and one student participated in the peer debriefing interviews. The purpose of the interviews was to increase credibility and confirmability of the study by verifying the emerging themes found by coding and categorizing the data from the student focus groups into categories, as shown on Table 5. A handout explained the research questions, the additional points addressed by this study, the definition of credibility and confirmability, and the categories that lead to the emerging themes (see Appendix A-7).

Table 5. Focus group categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Wish known/taken LSA sooner</td>
</tr>
<tr>
<td>2</td>
<td>Able to figure out why not doing well</td>
</tr>
<tr>
<td>3</td>
<td>Able to determine how learned; learn about self; whether right- or left-brain dominate</td>
</tr>
<tr>
<td>4</td>
<td>Grades improved; test better</td>
</tr>
<tr>
<td>5</td>
<td>Learned best time of day to study or take classes</td>
</tr>
<tr>
<td>6</td>
<td>Learned what environment need (quiet/noise, formal/informal, alone/group)</td>
</tr>
<tr>
<td>7</td>
<td>Teacher’s style not match learning style; teachers s/b aware of different styles</td>
</tr>
<tr>
<td>8</td>
<td>Confidence level increased; feel good about what works; no right or wrong way</td>
</tr>
<tr>
<td>9</td>
<td>Improved study habits; LSA helped with how to study</td>
</tr>
<tr>
<td>10</td>
<td>Helps teachers realize more than one way to learn</td>
</tr>
<tr>
<td>11</td>
<td>Learned about four modalities (visual, auditory, tactile, kinesthetic)</td>
</tr>
<tr>
<td>12</td>
<td>Helped make choice of certain class/teacher who complements [style]</td>
</tr>
<tr>
<td>13</td>
<td>Appreciation of how others learn; no right or wrong style</td>
</tr>
<tr>
<td>14</td>
<td>Helped create environment need; helped adapt to teacher [style]</td>
</tr>
<tr>
<td>15</td>
<td>Reduced stress; enjoy learning/studying more</td>
</tr>
<tr>
<td>16</td>
<td>Reinforced what already knew</td>
</tr>
<tr>
<td>17</td>
<td>No change</td>
</tr>
<tr>
<td>18</td>
<td>LSA tool accurate reflection of learning style</td>
</tr>
</tbody>
</table>
As a result of the student focus groups discussing the impact of the LSA tool and training, five emerging themes evolved from eighteen categories. The five emerging themes and categories as shown in Table 6 were shared with the peer reviewers in their interviews.

**Data Analysis**

Data analysis was ongoing and continued throughout the data collection process. The data analysis was subject to revision as I developed a system of coding and categorizing field notes from the audiotape transcriptions and the focus group analysis worksheets, allowing for the most effective way to tell the case story. As primary researcher, I came to the fieldwork with some orienting ideas, as did the field note recorders, the student recorders, and the two peer debriefers, who provided a sounding board throughout the design, collection, and analysis stages. Tighter designs provided clarity and focus, especially important for beginning researchers (Miles & Huberman, 1994).

Well-delineated plans kept the task of data collection and analysis from becoming overwhelming. Processed field notes, audiotape transcriptions, and focus group analysis worksheets were carefully documented. Continuous journaling provided an audit trail of my experiences, reflections, thoughts, and ideas. According to Miles and Huberman (1994), the researcher will become submerged in the data and might need months to sort through the data. Therefore, in order to plan the faculty debriefing interviews carefully, they were scheduled six weeks after the student focus groups. This time was used to synthesize and review the student focus group data, identifying patterns, categories, themes, and areas of questions (see Appendix A-7).
This researcher used analytic induction to determine the common themes in the data collected from the focus group discussions and to determine a proposed explanation based on the accumulated data. The point of saturation, where new observations cease to add new information, was reached after the pilot project student testimonies, two student focus groups, one student debriefer interview, and five faculty debriefer interviews were completed. A major conceptual responsibility of qualitative case researchers is to seek patterns of data to develop the issues (Denzin & Lincoln, 1994).

The purpose of being in the field was to describe and analyze patterns and relationships. The task required analytic categories determined in advance by deduction, or arrived at gradually by induction. Both approaches required input from multiple sources in order to organize the facts and findings into a comprehensive, meaningful set of generalizations (Miles & Huberman, 1994). As researchers and participants, my colleague, the faculty members serving as peer debriefers, the student recorders and member checkers, and I all brought background knowledge to the table. We observed and deciphered details, complexities, and subtleties that would have eluded less knowledgeable observers. “Leading” with conceptual strengths, knowing which questions to ask, and which observations to attend to closely was important (Miles & Huberman). Therefore, the information load was great and the process for tracking and organizing the field notes was vital to ensure a rich and meaningful case story.

Immediately following each focus group, my colleague and a faculty member, who served as recorders and three of the four students serving as member checkers filled out a Focus Group Analysis Worksheet to record key impressions of the focus group discussion (see Appendix B-2). The worksheet began with the date of the focus group, location, number
of participants, investigator's name, recorder/board name, and recorder/field notes name.

The worksheet also included the two open-ended questions and the topic-specific questions that were used when necessary to probe further during the focus groups. Each question on the worksheet included a section that provided an opportunity for a brief summary of the key points and notable quotes.

The notes for data analysis included detailed comments recorded by the field note recorders, main points recorded by the student recorder on the flip chart or white board throughout the focus group, the audio tape, the video tape, transcriptions documents, and the focus group worksheet analyses. In addition, I reviewed the LSA tool and training material and the results of the Successful Learning survey questions and open-ended comments. The multiple sources of notes facilitated the sorting and analysis of the field notes as I blended the findings with my background knowledge to ensure that emerging patterns and important anecdotal information were not overlooked.

The sources of data were fractured, coded, and analyzed in a meaningful and logical way. This was critical to the data analysis (Krathwohl, 1998). Data source organization was clearly laid out for this case study to enrich the research analysis, results, and conclusion stages. Four sources of data were used for this study: the first two were the primary data sources, and the second two were the secondary data sources:

1. Student focus groups (January 21, 2003);
2. Peer debriefing interviews (March 4, 2003);
3. Reports and primary data from the Successful Learning student and faculty course evaluations (Fall 2001, Fall 2002); and
4. Pilot project student testimonies from the board of trustees meeting (March 20, 2001).
The constant comparative method of analysis, which included: (1) organizing and reducing the raw data or field notes; (2) generating general categories, and (3) interpreting patterns and themes, was used to interpret the data collected (Glaser & Strauss, 1967). The field notes were organized, read, and reviewed; relevant points were highlighted; categories were determined and numbered. The various sources of primary and secondary data were grouped and assigned data codes, as shown in Table 5.

For each focus group data set, the transcribed notes and other appropriate documents were reviewed, relevant points highlighted, and these points were transferred to a summary chart and categorized and numbered. The highlighted items on the original documents were assigned a number corresponding to the appropriate category on the summary chart. A separate summary chart was made for each set of documents and organized by using the same consistent numbered categories for each set. The charts facilitated the visualization and identification of categories and themes, as well as the movement and manipulation of the field notes as needed to ensure that the points were collected, analyzed, and grouped appropriately. Then each highlighted item with the same assigned category number was counted and the total recorded on the summary charts. The results from the summary charts for the 9:00 a.m. and the 3:00 p.m. focus groups were combined. These results were compared with the recorder's analysis on the Focus Group Analysis Worksheet to ensure that all data recorded and coded was consistent and accurate. As related categories were grouped, emerging themes were observed. The working transcripts were placed in the sequence by which the groups were conducted (Krueger & Casey, 2000).

As the categories were determined for each set of transcripts, relationships between the information within the categories were analyzed, points of conflict were identified, and
themes began to emerge. As shown in Table 6, numbers ONE through FIVE were used to label the emerging themes. In Chapter Four, the results of the student focus groups will be reported by the assigned group data codes, with relating categories and quotes within each data source group. The input, reflections, and feedback of the participants were sought at

Table 6. Emerging themes and related categories

<table>
<thead>
<tr>
<th>Theme</th>
<th>Related category</th>
</tr>
</thead>
</table>
| Theme ONE: Students Create Environment Conducive to Learning and Improved Study Skills | 1. Learned about environment need  
2. Learned to create environment need  
3. Improved study habits  
4. Discovered time of day best for studying & learning |
| Theme TWO: Grades and Stress Impacted | 1. Wished had LSA tool and training at younger age  
2. Grades improved  
3. Stress declined |
| Theme THREE: Gained Understanding/Appreciation of How Learn Best and Improved Satisfaction | 1. Determined how, right or left brained  
2. Learned what modalities are strengths  
3. Increased confidence, no right or wrong way – in how I learn  
4. Reinforced what already knew  
5. Gained appreciation of how others learn |
| Theme FOUR: Teachers Impact on Learning Experience | 1. Helped teachers realize more than one way to learn  
2. Helped select teacher and courses with complementary style  
3. Recognized that teaching style did not match learning style |
| Theme FIVE: LSA Accurately Reflected Student’s Learning Styles | 1. Majority of the 9:00a.m. focus group voiced that the LSA reflected their style accurately  
2. The 3:00p.m. focus group indicated unanimously in a go around that LSA accurately reflected learning style |

Note: Categories in each emerging theme is listed by most frequently occurring to least frequently occurring.
various times and through various tools throughout the analysis to ensure authenticity of the data interpretation.

The process followed for sorting and coding the data from the peer debriefer interviews was focused around the emerging themes from the student focus groups. Each interview transcription was reviewed, main points were highlighted, and potential quotes were marked. The transcription for the first interview with Faculty B was not detailed due to poor tape recording. This peer debriefer’s interview had been rich and meaningful, so after contact by phone, she agreed to write additional comments for the research. The original transcription of poor quality and the Peer Debriefer: Verification of Findings hand out was emailed to Faculty B for reference; additional detailed comments were added to the incomplete transcription by Faculty B and emailed back to me.

Main points of the transcribed interviews were highlighted; categories were identified, numbered, and recorded on a summary chart for the second interview. It became evident early on that the categories were similar for subsequent interviews. Consequently, the highlighted points were then labeled ONE through FIVE according to the relevance to the original emerging themes from the student focus groups. A sixth theme began to emerge from the faculty peer debriefer interviews. The results of the interviews will be organized around the research questions and reported in Chapter 4.

Similar coding and processes were used for the secondary data sources, student testimonies of the pilot project and Successful Learning course evaluations by students and faculty as appropriate. Relevant sections from course evaluations were sorted, coded, and reported in the results; relevant comments from the testimonies were coded and reported in Chapter 4. Finally, colored highlights and chapter numbers were used to “code” the sorted
and coded data and documents to indicate the chapter and section of the study in which to report the information and findings appropriately. The sorted and coded data were then grouped by type of primary and secondary sources to prepare for the final stages of editing, reporting results, and drawing conclusions.

From the beginning of the case study throughout the fieldwork experience, the research questions and focus group questions were reviewed and revised as needed. The overarching research questions and exploratory questions guided the conducting and analysis of this case study. The overarching research questions were as follows:

1. What are the changes in learning when individual learners gain knowledge of their preferred learning styles?

2. What do students perceive as the outcome of the LSA tool and training on their educational and personal lives?

The additional exploratory questions addressed in this study included:

a. As a result of the LSA tool and training, how, if at all, do learners feel empowered and responsible for their learning, thus, creating an environment conducive to successful and satisfactory learning?

b. How, if at all, has the LSA learning experience changed student grades?

c. How has the LSA learning experience affected student satisfaction with the educational experience?

d. Do students feel more or less stress with their academic experiences?

The open-ended questions used for the student focus group discussions were as follows:

1. How, if at all, has the LSA experience impacted you? Tell me about it?

2. What changes, if any, has the LSA had on your academic experience?
The following topic-specific questions were also used as appropriate to facilitate discussion:

3. In what ways, if at all, do you use the knowledge gained by the LSA tool and training to create a positive learning environment for yourself?

4. Could you describe for me what, if any, study strategies or techniques you have adopted since using the LSA?

5. Could you describe for me how your satisfaction with learning has changed since receiving the LSA tool and training?

6. What were your expectations today? Is there anything else you would like to share?

This continuous evaluation focused the data collection and analysis, ensuring that questions were modified as necessary. In addition, the field notes were richer and more meaningful, as only observations with an obvious, direct, and potentially important link to the research questions were recorded. In addition, familiarity with the questions ensured that an observation or comment that could have been initially ignored, and that could turn out to be important, would be included. Qualitative research allows for modification and second chances (Miles & Huberman, 1994).

For example, after the first focus group my colleague and I discussed the data collected at the initial focus groups to ensure effective organizing and reducing of the raw data. After discussion and gaining familiarity with the data, the colleague noted highlights of the student focus groups on the Focus Group Analysis Worksheet to assist me later when working to generate general categories, meeting the criteria of relevance and meaningfulness (Seidman, 1991). The faculty field note recorder organized the results from her observations and notes in the Analysis Worksheet, as did the student recorders. The student recorders also
assisted in focusing the data analysis by providing member checks at the end of each focus group.

Ethical Considerations

According to Glesne (1999), ethical decisions are not peculiar to qualitative inquiry, and guidelines for research grew out of medical and other intrusive studies, leading to an emphasis on informed consent, avoidance of harm, and confidentiality. Beginning in 1974, the Federal Government required Institutional Review Boards (IRB) for the purpose of reviewing applicants’ proposals to ensure the following: the subjects have sufficient information to make decisions about participation and their ability to withdraw without penalty at any point; unnecessary risks are eliminated; benefits to the subject and society outweigh potential risks; and qualified investigators are conducting the experiment. The Iowa State University IRB approved the Informed Consent Document for this research project (see Appendix A-5). Facilitators of the focus groups began the sessions with an explanation of the document, allowing time for questions.

Glesne (1999) also addresses several roles that qualitative researchers often assume: exploiter, reformer, advocate, and friend. After reviewing these roles, I did not feel that ethical dilemmas would arise in these areas due to the nature of this case study. However, I was sensitive to the potential dilemmas and planned to follow standards of ethicality if and when these dilemmas did arise. From the point of view of the participants, the most common concerns are privacy and confidentiality. Each stakeholder in this study needed to be constantly vigilant that the specifics of what each saw and heard was not discussed with anyone outside of the study (Glesne).
While the students and faculty gave of their time and shared their personal experiences, they did not receive monetary remuneration for this study. Although it may have been inadequate compensation, my listening to participants carefully and seriously provided an opportunity for reciprocity. Participants, both students and faculty, were given a voice and sense of importance, not to mention an opportunity to better understand themselves and their needs as learners by reflecting on, and voicing answers to, the questions. The quality of the questions and attention to the answers by careful listening provided context for personal exploration by the participants (Glesne, 1999).

**Trustworthiness and Verification**

The “scientific rigor” of quantitative research is established on the basis of the following criteria: internal and external validity, reliability, and objectivity. On the other hand, the “trustworthiness” of qualitative research is established on the basis of the following four criteria: credibility, dependability, confirmability, and transferability. Trustworthiness may be described as the credibility of qualitative research based on the appropriate handling of data gathering and interpretations and analysis (Krathwohl, 1998). According to Lincoln and Guba (1985), *credibility* is based on whether or not my data, my interpretations, and my conclusions were accurate. *Dependability* ensures that consistency and stability were maintained, while allowing for an evolving design. *Confirmability* assured that the findings were based on the data and that the interpretations were logical. Finally, the study has *transferability* if the information about the findings can be transferred to another setting (Lincoln & Guba, 1985).
Credibility

Credible qualitative research must demonstrate that the inquiry was conducted in such a way as to ensure that the subject was accurately identified and described (Marshall & Rossman, 1989). In addition, I established credibility by demonstrating that the multiple realities discovered and interpreted during the study were accurate portrayals (Lincoln & Guba, 1986). Triangulation, member checking, and peer debriefing are strategies used to strengthen credibility of the qualitative research in this study (Lincoln & Guba, 1985).

*Triangulation* in qualitative research is achieved most often through multiple data-collection methods. However, to increase confidence in the research findings, “multiple kinds of data sources (i.e., not just teachers, but students and parents as well), multiple investigators, and multiple theoretical perspectives” may be used (Glesne, 1999, p. 31). *Investigator triangulation*, involving more than one investigator in the research process, is considered good practice (Mathison, 1998) and was used to ensure rich and valid results. The Success Center coordinator participated in the research planning, organizing, implementing, and served as peer debriefer of the focus groups. This college employee had worked extensively with the pilot project and the implementation of the LSA tool and training initiative at the rural community college. She had gained the support and trust of the students and faculty. In addition, a program coordinator served as a sounding board throughout the study design and served as a peer debriefer.

*Data triangulation* is simply using several data sources (Mathison, 1998). Data triangulation in this study was achieved through the review and analysis of the LSA tool and training materials, the testimonies from the pilot project presentation for the board of
trustees, the student focus groups field data, the faculty peer debriefer data, and pertinent comments from the Successful Learning course open-ended questions.

For the student focus groups, a field note recorder logged specific responses and quotes, with a transcription of the tape recording used as a backup. In addition, a student recorder noted main ideas on a white board or flip chart as the discussion proceeded. Member checks were conducted at the end of the focus groups by reviewing the information recorded by the student recorder with the student focus group participants. The focus group participants' reflections and feedback regarding their intended meanings during the discussion enriched the study.

After the student focus group field notes and data were analyzed and themes emerged, I met with five faculty members and the one student who had served as a recorder and member checker. The purpose was to have these participants serve as peer debriefers. A handout was designed that included my research questions, additional points addressed, the definition of credibility and confirmability, and the emerging student focus groups themes (see Appendix A-7). The participants were asked to comment on their reaction to the emerging themes and share their perspectives from their experiences with the LSA tool and training.

Dependability

In qualitative research, dependability enhances the trustworthiness of the research and study. Several aspects of the design ensured the stability and consistency of the research process. Evidence of the appropriateness of the study design throughout the process was provided by the student recorder member check of the findings, beliefs, and attitudes at the
end of each focus group. Further evidence enhancing dependability of the research design was the use of the Focus Group Analysis Worksheet by all recorders to summarize their perceptions and observations, the follow-up peer debriefing interviews, the number of participants in the focus groups (22), the student recorders providing member checks (3), the field note recorders (2), and the length of the focus groups (60-90 minutes).

**Confirmability**

Confirmability questions whether the data confirm the general findings and whether or not the data lead to the implications (Marshall & Rossman, 1995). This study ensured the objectivity, or confirmability, through the use of a detailed audit trail. This audit trail was a “record of the data gathering and analysis processes kept by the researcher so that another researcher could judge the appropriateness of those processes or possibly use the record to replicate the study” (Krathwohl, 1998, p. 680). The audit trail also included the videotape and transcriptions of the testimonials from the pilot project, the audiotapes and transcriptions of the student focus groups and the peer debriefer interviews, the Focus Group Analysis Worksheets filled out by the recorders (see Appendix B-2), the charts made to document, code, and analyze the emerging themes, and the Peer Debriefing: Verification of Findings documentation of the emerging themes (see Appendix A-7). In addition, I maintained an extensive and comprehensive journal, with regular entries of my thoughts, emotions, reactions, and ideas for design. I referred to my journal throughout the study as a guide to where I had been and where I needed to go with the study in order to ensure trustworthiness of the results.
Transferability

Finally, the findings of this study have the potential of transference to another context (Whitt, 1991). The triangulation of multiple sources of data achieved the goal of providing information about the general phenomenon, allowing extrapolation to situations with similar contexts (Marshall & Rossman, 1995). As is the purpose with a case study, this case study does not attempt to generalize to others, but rather provides a detailed account of the experiences of the participants, in other words, to tell their story. Through this in-depth study of these students and faculty who have participated in the LSA tool and training and a small, rural Midwestern community college, the readers have an opportunity to reasonably assess the appropriateness of applying the observations of these students, faculty members, and this rural community college to their own situations. Thick description, or detailed information, on the participants’ characteristics, positions, experiences, and reactions should help others determine whether the information and findings apply to similar situations.

Summary

This chapter outlined in detail the research methods used in this study. It was my intention that the case study be conducted and written so that it could be read with interest. Thick description and comparison will be used in the results, analysis and conclusions in Chapter 4 and Chapter 5. This thick description will identify the emotions and feelings of the participants and ensure that voice is given to the students as to what they perceive as the result of involvement in the LSA tool and training. Comparisons will be made on specific, as well as general, variables of the observations made from the student and faculty focus groups.
However, as researcher, I could not know at the outset what the perceptions and main issues would be. I entered the case study with expectations, knowing that certain events, observations, and reactions would be important, but that I would discover that some of what was thought important may actually be of little significance. Case content must evolve as the analysis and writing take place. The aim was to find the story that best represents the case. However, the criteria chosen to give the students voice, the identification of appropriate emerging themes, and the goal to give the story meaning is ultimately my responsibility (Denzin & Lincoln, 1994).
CHAPTER 4. RESULTS AND DISCUSSION

Chapter 3 outlined the research methods used in this case study in detail. This chapter explores the appropriate development of the case study method for this research, presents the emerging categories and themes, as well as the results of the study.

Overview

According to Maxwell (1996), transferability is not crucial for qualitative studies. However, in an effort to enhance transferability, students from the Arts and Sciences transfer program, the Career Option program and Vocational Technical program were involved in the focus groups. In addition, traditional and non-traditional students were also involved to enhance the diversity. Faculty members were also involved in a follow-up to help validate the feedback from the student focus groups.

Two focus groups with a total of twenty-seven students from a small, rural community college is a small sample size with very specific demographics. However, the purpose in qualitative research is to present data that are considered detailed and complete enough that they provide a realistic picture of what is going on (Maxwell, 1996). The conclusions, recommendations, and implications are described in Chapter 5 so that educators and learners can assess the potential transferability of the results to other individual lifelong learners.

In order to ensure dependability, one current colleague and two faculty members (former colleagues) were used as a resource as the study was planned and data collected. In addition, two field note recorders and four student recorders were used in the data analysis stage. Their reactions and summary of observations from the member checks and the Focus
Groups Analysis Worksheets were woven throughout my results. According to Brotherson and Goldstein (1992), the concept of dependability examines the extent to which the process of the study was consistent across researchers. Using one colleague, six faculty members, and four students to assist in data collection and analysis helped to ensure that the data were not weighted to reflect my perceptions (Brotherson & Goldstein).

The purpose of this study was to determine if students can learn strategies that enhance their ability to learn, reduce intimidation, and manage stress during the learning process in order to maximize learning potential. Because as primary researcher, I had a personal interest in this study and was very selective, focusing on one issue, the case study method was intrinsic for this research (Tellis, 1997).

**Development of the Case Study Method**

This case study followed the case study method as described by Yin (1994), and was organized around four stages:

1. Designing the case study;
2. Conducting the case study;
3. Analyzing the case study evidence; and
4. Developing the conclusions, recommendations, and implications.

This section provides evidence of a strong relationship between Yin’s method and the techniques and steps used in this case study.

**Designing the study**

The design or development of the protocol is the first stage to the case study method recommended by Yin (1994) and includes two important areas: (1) determining the skill
involved; and (2) developing and reviewing the protocol or design. I have twenty years of teaching and administrative experience, applying the concept of multiple intelligences in the classroom, using MBTI to better understand individual needs, and training students and faculty members in the use of the LSA tool and training at the community college. Yin (1994) stated that the development of the rules and procedures contained in the design or protocol enhances the reliability of the case study research. Following extensive reading on relevant topics and applying the experiences gained, the research questions for this case study were developed. The “what” questions justified an exploratory study and the “how” questions made the study explanatory as well. Great rigor and discipline were used in the design in order to contribute to the progress and reliability of this study.

Rigor and quality of qualitative inquiry are established by addressing the foundational criteria framework and the emerging relational framework (Lincoln, 1995). I included the emerging relational framework in this research in three important ways:

1. *Voice* was given to students who had taken the LSA tool and training. The research included the perspective of the students who participated in the focus groups, as well as the faculty, who had been involved in the LSA tool and training by either: (a) facilitating the course where the follow up training originally took place; (b) opening their classrooms for the actual focus groups for the research; or (c) participating in the peer debriefing interviews. This provided an opportunity to hear “alternative voices” (Lincoln, 1995, p. 283).

2. *Reciprocity* is also important when addressing emerging relational frameworks by establishing reciprocal relationships “... marked by a deep sense of trust, caring, and mutuality” (Lincoln, 1995, p. 284). The research benefited from the support and
guidance of the Success Center instructor, whose responsibilities include implementation of the LSA tool and training internally for all full time students attending the community college. The Success Center instructor helped coordinate efforts with the faculty as well as the students on campus. She also provided pertinent follow-up information from the Successful Learning course that included employing the LSA tool and training for all new full-time Arts and Sciences students at the college. Her vast knowledge and involvement with the LSA tool and training provided me with a rich and comprehensive view of the experience for the students and faculty. Rather than viewing her multiple roles as a "biased factor," the research benefited and was enriched by her support and involvement.

3. My intent for the research was to "serve the purposes of the community in which it was carried out" (Lincoln, 1995, p. 280). To ensure that this occurred, I discussed the research with the students, the faculty, and the Success Center instructor throughout the planning and data collection stages. In addition, the results were shared with the research participants and the Chief Academic Officer of the college, to be interpreted and used as an educational tool.

Conducting the study

This stage included extensive preparation for data collection, discussion of the focus group questions by selected students who had participated in the LSA tool and training, and conducting the peer debriefing interviews with faculty. The multiple sources of data used in this case study were important to the reliability of this study (Stake, 1995). Four sources of
data were used for this study, the first two were the primary data sources and the second two were the secondary data sources, and were as follows:

1. Student focus groups (January 21, 2003);
2. Peer debriefer interviews (March 4, 2003);
3. Reports and primary data from the Successful Learning student and faculty course evaluations (Fall 2001, Fall 2002); and
4. Pilot project student testimonies from the board of trustees meeting (March 20, 2001).

Documentation was exact and broad. Physical artifacts included the LSA tool and training materials used for students and the Discovery Session materials used for faculty professional development. Archival records included the Successful Learning evaluation results. No single source was more important; rather, they were complementary and were used in tandem.

The research addressed the foundational criteria framework by considering the three concepts: credibility, transferability, and dependability (Lincoln & Guba, 1985). To ensure credibility, triangulation and member checks were used. The triangulation involved the use of participation by students and faculty as “...different sources of the same information” (Lincoln & Guba, 1985, p. 305). Multiple investigators were used. Transferability was maintained by the use of complete descriptions, multiple focus groups and interviews, and purposeful sampling (Brotherson & Goldstein, 1992). Dependability was maintained by ensuring that the research was stable and consistent, yet flexible as the design evolved. Peer debriefers, multiple researchers, and an audit trail were used (Guba, 1981).
Analyzing evidence

This stage is one of the least developed aspects of the case study method, and consists of examining, categorizing, tabulating, and recombining the evidence to address the initial purpose of the study (Yin, 1994). This case study used tables to display data, tabulated the frequency of events and responses, ordered the information, and used multiple methods in lieu of statistical analysis (Miles & Huberman, 1984). This researcher carefully reviewed and rechecked to ensure the analysis was of high quality, used all relevant evidence, used rival explanations, and addressed the most significant aspects of this case study, assuring that this researcher's knowledge and experience were used to maximum advantage in this study.

Developing conclusions, recommendations, and implications

The final analysis and conclusions based on the evidence represent the communication between the user and the researcher and are, therefore, of utmost importance. This researcher refrained from technical jargon and used clear explanations in order to assure the reader easily understood the results and potential for further implications of the case study results.

Results of the Study

The purpose of this case study was to determine if students can learn strategies that enhance their ability to learn, reduce intimidation, and thus manage stress during the learning process in order to maximize learning potential. The results of this study are represented in sections organized around the four major data sources. The two primary data sources are student focus groups and peer debriefing interviews. The two secondary sources of data are...
Successful Learning course evaluations by students and faculty, and student testimonies from the pilot project.

Within each section or major data source, the results are presented in subsections organized around the purpose of the study that was expressed by the two overarching questions and the four exploratory questions that guided this study:

**Overarching Research Question 1:** What are the changes in learning when individual learners gain knowledge of their preferred learning styles?

**Exploratory Questions:**

a. As a result of the LSA tool and training, how, if at all, do learners feel empowered and responsible for their learning, thus, creating environments conducive to successful and satisfactory learning?

b. How, if at all, has the LSA learning experience changed student grades?

This subsection was titled: Changes in Learning.

**Overarching Research Question 2:** What do students perceive as the outcome of the LSA tool and training on their educational and personal lives?

**Exploratory Questions:**

  c. How has the LSA learning experience affected student satisfaction with the educational experiences?

  d. Do students feel more or less stress with the academic experience?

This subsection was titled: Perceived Outcomes.

To protect the confidentiality of the participants, the quotations and excerpts included in this chapter were identified by data source only. Within the research questions, the students’ responses and quotes will be organized around the emerging themes and related categories as shown on Table 7.
Table 7. Relating the research questions and the emerging themes

<table>
<thead>
<tr>
<th>Exploratory Questions</th>
<th>Emerging Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overarching Research Question 1: What are the changes in learning when individual learners gain knowledge of their preferred learning styles?</strong></td>
<td></td>
</tr>
<tr>
<td>a. As a result of the LSA tool and training, how, if at all, do learners feel empowered and responsible for their learning; thus, creating an environment conducive to successful and satisfactory learning?</td>
<td>Theme ONE: Students create environments and improve study skills</td>
</tr>
<tr>
<td>b. How, if at all, has the LSA learning experience changed student grades?</td>
<td>Theme TWO: Improve grades and reduce stress level</td>
</tr>
<tr>
<td><strong>Overarching Research Question 2: What do students perceive as the outcome of the Learning Style Analysis (LSA) tool and training on their educational and personal lives?</strong></td>
<td></td>
</tr>
<tr>
<td>c. How has the LSA learning experience affected student satisfaction with their educational experience?</td>
<td>Theme THREE: Gain understanding and appreciation for how learn; improve satisfaction and confidence</td>
</tr>
<tr>
<td>d. Do students feel more or less stress with their academic experience</td>
<td>Theme FOUR: Teachers influence the learning experience</td>
</tr>
<tr>
<td></td>
<td>Theme FIVE: LSA accurately reflects learning style</td>
</tr>
<tr>
<td></td>
<td>Theme SIX: Communication improves between students and faculty</td>
</tr>
</tbody>
</table>

**Student focus groups**

The focus groups with the twenty-seven students from the rural Midwestern community college resulted in an abundance of data about their perceptions and experiences with the LSA tool and training. They shared their thoughts concerning the effect and impact that the knowledge of their learning styles did, or in some cases, did not, have on their learning and educational experiences. As their responses were sorted, coded and categorized, five themes began to emerge that were presented to the peer debriefers in March 2003.
Theme ONE: Students Create Environments Conducive to Learning and Improve Study Skills.

Theme TWO: Students Improve Grades and Reduce Stress Levels

Theme THREE: Students Gain Understanding and Appreciation of How They Best Learn; Increase Satisfaction and Confidence.

Theme FOUR: Teachers Influence the Learning Experience.

Theme FIVE: LSA Tool and Training Accurately Reflects Students' Learning Styles.

Although, ultimately the combination of the categories that made up the original five themes were slightly modified in the final analysis, as reported in Chapter 5, only one additional theme emerged from the peer debriefing interviews.

Theme SIX: Communication Improves between Students and Faculty.

Of the twenty-seven students participating, ten of them were male and seventeen were female. The results did not indicate any strong differences in the general feeling or perceptions based on gender of the student. None of the participants were of a minority race or culture and the majority were students from homogenous small, rural high schools. Only four were non-traditional in the sense that they had returned to college after life experiences following high school. One student was a SAVE student, which means he or she came to the community college with an IEP (Individual Educational Plan) from high school. Three students were volunteers as a result of personal contact, either by faculty members directly or email sent by this researcher based on faculty recommendations; the balance were members of the two courses that two faculty members had volunteered for the focus group. Twenty of the students were Arts and Sciences students who planned to transfer to a four-year college
or university upon completion of their degrees; seven were Career Option or Vocational Technical students.

The following sections and subsections contain information and quotes from the focus group discussion with the student participants. The data collected from the focus group discussions do not reflect others’ perceptions of their experiences with the LSA tool and training, but rather, their understanding and view of the impact. The Focus Group Analysis Worksheets filled out by the student member checkers and the field note recorders were brief summaries of their perceptions of what were key points, observations, and notable quotes from the student focus group discussions (see Appendix B-2) and were used to ensure credibility and confirm the general findings that will lead to the implications in Chapter 5.

As mentioned previously, the results in this section were organized around the two overarching research questions used in this study:

1. What are the changes in learning when individual learners gain knowledge of their preferred learning styles?

2. What do students perceive as the outcome of the Learning Style Analysis (LSA) tool and training on their educational and personal lives?

Within each overarching research question, emerging themes and their related categories as shown in Table 6 organized the results.

The first focus group was held at 9:00 a.m. at a main campus of the community college in this study during a regularly scheduled class. As a result of the snowball sampling strategy, three participants joined the class of six who had volunteered as a result of identification by their instructor (status sampling strategy).
The first focus group discussion started out slowly and it became apparent that not all the students were able to visualize the LSA tool and training specifically. At one point, a participant asked if a copy of the tool was available for review to refresh her memory. As facilitator, I referred the participants to the poster in the room that summarized the six basic areas and 49 elements that were the basis of the LSA tool; we took time to briefly review the LSA tool and training. Upon completion of the focus group the students helped themselves to food and began to ask me questions about my research. They were more relaxed and engaged the last five to eight minutes of the class period.

For the second focus group, the field note recorder and I drove to each of the four sites to deliver materials to ensure that the experience was similar at all locations. The second focus group was conducted on the college interactive television system. This time for discussion between focus groups resulted in several changes in the afternoon format: a brief introduction and background of both my colleague serving as field note taker and me as facilitator and researcher, the review of the six elements of the LSA tool and training, and the opportunity to call upon each site for introductions of participants before the discussion started. During the planned contact with each site, all participants introduced themselves, told when they had taken the LSA tool and training, and what they had learned about themselves from the LSA tool and training. In addition, the planned sequence of the focus group questions was more closely followed in order to allow better coordination of responses from all location participants and to ensure that the field note recorder could more easily follow the dispersed conversation.
When given the opportunity to introduce themselves and share what they learned about their learning styles from the LSA tool and training, the broad range of responses included:

...LSA helped me with how to study ... learned that I learn better with music on ... it helped teachers realize there's more than one way to learn ... like to study with noise, by myself ... LSA showed that I like working in large groups ... I like to work with a partner, study area has to be quiet ... learned that I like to relax when I study ... like to study by myself and I am a visual person ... I'm right-brained and need to study with music ... like to do hands-on activities ... learn by hearing things ... I'm more hands-on than anything.

The remainder of the second focus group discussion flowed more smoothly than the earlier focus group and the resulting discussion was rich and informative.

**Overarching research question 1: Changes in learning**

Two of the five emerging themes, as shown in Table 6, resulted when participants responded to questions about their LSA experiences that related to the first overarching research question, "What are the changes in learning when individual learners gain knowledge of their preferred learning styles?" Emerging Theme ONE indicated that as a result of the LSA tool and training, students created environments conducive to their learning needs and improved their study skills; emerging Theme TWO focused on how the LSA impacted their grades and stress level.

Emerging Theme ONE was a combination of four general categories. The first category indicated that as a result of the LSA tool and training, the students learned what environments they needed when learning:

*I think the environment was one of the things that helped us as far as learning. A lot of things are distractions for me, can be distractions for me. So I knew that in a way, but with the LSA, I think that was something that helped point out just a little bit more about the environment that I do study in. I like it to be
quiet... even in a classroom, if the teacher is talking or someone else is talking and I'm trying to take notes, it's very easy to get distracted. So I'm the type of person that just likes to be by myself and do things for myself.

I was a visual learner; I like it quiet.

If there is noise or something I don't even bother with studying because I can't.

LSA can tell you how or where to study best; it can really help you.

I like to work in pairs; it helps me when someone else is there. I thought that others thought I didn't want to do the work, but that's how I learn.

I used to study with groups, but I didn't get things done. Now I know I study better on my own.

It's nice to know what your learning style is though, so you can adjust it.

[At the] library, I like studying there now... like in high school, I liked studying in my bedroom. LSA helped me learn to study somewhere quiet.

Learned what I need to know and how to learn better studying.

Closely related to the above category, the second category revolved around students learning to create the environment needed once they had learned what was needed:

They (teachers) just lecture and you have to take your own notes. And so, I've learned ... take notes before and then when he's lecturing, you follow along with your notes. And if he adds anything, you can just add it to your own notes. I think I knew that before I took the test so it ... just reinforced it.

I knew how to adapt to their way of teaching, so it reinforced what I need to do for certain teachers.

I like [teacher's name] teaching. I like having the notes, too. Where they can just lecture and I just don't get anything out of it.

I think that one of the things I got out of the LSA was learning how to adapt.

When I took mine it told me that I should study in a quiet area and I had always studied with the TV on so I'd get easily distracted.

In a setting where an authority figure's learning does not match my own, I realize that I will have to take the way they teach it and twist it a little to fit the way I learn best.
It taught me to work to better understand each teacher. I learned to study in a quiet environment, take better notes, and study more in-depth for tests.

I read my text out loud; through the LSA I learned I needed repetition.

Writing notes over again helps me review.

[The LSA showed me that it] helps me to write a lot of notes down ... step-by-step.

I like to rewrite notes; I learn better that way. Also reading the text chapters out loud helps me learn better too.

[My study area] depends on where I'm at; [it] needs to be quiet; [the] library is where I can lay everything out and see it all.

LSA helped me figure out what to do and what is best for me.

The third category included statements by student participants indicating that their study habits had improved as a result of the knowledge gained about their preferred learning styles:

I studied a lot more once I got to college, because I was like average in high school [and the LSA affected how approached studying].

It [LSA] got me to think about how I study. And I think that is probably the one thing I gained from it.

LSA taught me how I study best. I took better notes and studied more thoroughly from those notes.

I always like to study alone and lay on my bed instead of sitting at a desk ... [the LSA] test validated this.

[Like to study] at home and alone; noise helps me study better.

In high school, I didn't have to study much and got all B's. At college, I realized I had to study.

I do study differently now that I'm in college than I did when in high school.

It's a good tool for college students to have; helps to know study habits.

Helpful to know how I study.

[LSA] gives tips to study so if you are struggling, they give you general ways to study a different way, a broader range of how to study.
The fourth category emerged when two students indicated they had discovered the time of day that was best for studying and learning:

The main thing the LSA helped me with was to realize the best times of day for studying.

When taking morning classes constantly through early afternoon would get frustrated and not retain too much.

Emerging Theme TWO indicated an impact on grades and stress levels. The first category voiced the need for learners to be exposed to the LSA tool and training at a younger age:

I think it actually would have been more helpful to have taken it at the high school level, because now I'm already set in my study habits and things like that.

The test should be taken earlier, like in high school because a lot is already set as a college student.

I wish I had known about the LSA in high school because it would have helped my science grades.

I wish they'd given us the study [LSA information] earlier, around 5th or 8th grade. Hard to change study habits now.

[LSA is a] good thing, but start administering it to high school or middle school [students].

In a second category, participants indicated improved grades due to the understanding of their learning style:

My GPA my freshman year was 0.67 [on a 4.0 scale]; now I am an honor student.

It definitely improved my test grades. The reason that test grades improved is because you know how to study better.

In a third category of responses for Theme TWO, participants indicated that stress levels had declined since using the LSA tool and training to understand their learning style:
I think knowing ... understanding what your style is ... how you study definitely helps you when you go into the classroom. If I didn’t know what type of person that I was and I went into a classroom and just tried to work with whatever I could, I mean, it’d be stressful.

The LSA has made me more satisfied with the amount of studying I do.

It [LSA] took some of the stress away.

Overarching research question 2: Perceived outcomes

The remaining three themes that emerged, as shown on Table 6, related to Overarching Research Question 2, "What do students perceive as the outcome of the LSA tool and training on their educational and personal lives?" Emerging Theme THREE focused on how students gained an understanding and appreciation of how they best learned and increased satisfaction with learning. Responses relating to this theme centered around five categories.

Several students in the first category indicated that the LSA tool and training helped them determine how they learned and whether they were predominately right-brained or left-brained thinkers:

What I didn’t realize is that I’m not the only one who has to use my hands when I’m learning. A squish ball was given to me during the LSA training. I didn’t use it. Instead, I’ve continued with my old habits (hair).

American Lit [was the] only class that would fit what I needed ... and I’m not a big reader; I am left-brained ... [and need] to read the text out loud. Through the LSA, I learned I need repetition.

Second, students voiced that the LSA taught them their preferred modalities—audio, visual, tactile, or kinesthetic:

She [the teacher] has notes and that’s how I like to learn. I have to see it and hear it.
I'm a visual person; I like to see it and that's how I learn it better, if I can see it.

Third, the students reported that their confidence had increased and that they now knew that there was no right or wrong way to approach learning:

*It helps students in different ways; every student gets different things ... out of the LSA.*

*No matter how I study, [it] is not right or wrong. I always wanted to work in groups and thought I didn’t want to work [hard], but it’s just how I learn.*

*I am more confident in understanding what I am learning.*

To students in the fourth category, the LSA reinforced what some students already knew about their preferred learning styles:

*I don’t think I’ve adopted anything new from it, because I’m already stuck in my habits and what I do when I study, but it was fun.*

*I don’t want to be negative but the LSA didn’t do anything for me ... Because I’ve already got my study habits down the way I do it, and I really didn’t change anything. It just told me what I already knew.*

*All it did was confirm what type of personality [I am].*

*It tells you what you already know.*

*I haven’t changed anything; I kept up with what worked for me. I quit doing things like [my] friends said worked for them.*

*[LSA tool and training] was interesting ... knew in back of my mind how I studied already, but it was interesting to take it.*

Students in the last category of Theme THREE indicated that the LSA tool and training also helped them gain an appreciation of how others learn:

*S sometimes others in authority do not appreciate this [learning styles do not match], like the only right way is their way, so I will try to remind them that we are all different people and learn in different ways.*

*I tutor [other students]; the LSA helped me learn that others don’t learn how I learn. It helps me out to help them.*
Emerging Theme FOUR related to Overarching Research Question 2 and focused on the impact that the teachers have on the learning experience. Several participants expressed in the first category that the LSA helped teachers realize there is more than one way to learn:

[LSA] test gave instructors knowledge to know that everyone doesn’t learn the same way... had classes with only tests as a score ... there needs to be other ways to shine than just a test.

Helps encourage faculty to understand students.

Second, other students voiced that understanding learning styles aided them in the selection of an instructor using a complementary style or in selection of a course designed around the students’ needs:

[Teacher’s name] has a learning style that matches mine and she appreciates and works well with all the different personalities of her students.

I now do my homework in the early afternoon and if at all possible, I avoid morning classes.

It (LSA) helped; I didn’t want certain instructors; a wider variety of activities helps students express themselves ... LSA helps students and instructors.

In the third category, students recognized that the teaching styles of certain teachers did not match their own learning styles:

Some teachers ... lecture and other teachers just talk. If they just talk, I ignore them ... I don’t listen ... and I read while he’s talking. If they actually lecture about a chapter I’ll sit and listen.

I’ve watched many students who have a very unstructured or difficult teacher drop the class or allow their grades to suffer.

It [LSA] tells you what kind of teachers there are. So you have to work to understand ... the teacher.

Instructors are aware of it [LSA] but didn’t act on it; I still see the same structure. It’d be nice to do hands-on activities once in a while.

Teachers should have more hands-on ... it’s more fun, and I learn better.
One student participant voiced frustration:

*The LSA [tool and training at the college in this study] is mostly for students; professors should take responsibility with it. That’s their job, to help us.*

Theme FIVE emerged from the first student focus group and indicated that the LSA accurately reflected students’ learning styles:

*There were some things I was surprised at my scores; they were pretty accurate.*

*It was pretty much on the head when it told me this is the best time for me to study and the conditions. It was pretty much me.*

*I took it last year, but I thought that it did reflect me pretty well.*

While conducting the second focus group, I changed the format to incorporate the lessons learned during the first focus group. In addition to responding to what I had learned, I wanted to compensate for, and enhance the use of, distance education technology. At the end of the second focus group, before the member checkers at each site reflected the summary of their observations and made comments to the entire group, I contacted each site and asked three final questions. The first question asked if the LSA tool and training was accurate and reflective of their learning styles. The consensus at each site was, yes, the LSA tool was accurate and “on target.” One student responded, “Yes, it told me what I already knew.” Another simply stated, “Good tool.” The second question asked if they had taken advantage of additional sessions beyond the one-hour training provided with the LSA tool and training: The response at all sites was “no.”

The third question asked the students what other questions should have been asked during the focus group. The student member checkers from each site summarized the responses to the third question:
Site A: "Can't think of anything."

Site B: "No."

Site C: "I liked the last one where you asked if the results fit you."

Site D: "What would you have changed about the test?"

**Peer debriefing interviews**

The peer debriefing interviews took place on March 4, 2003, on the campus of the rural Midwestern community college at a time convenient for the faculty members and student. Six participated in the peer debriefing interviews; one was a student who had served as a focus group member checker and in his enthusiasm, asked if he could meet with me; five were faculty members who had assisted in securing focus group participants and volunteered to serve as faculty peer debriefers. Faculty Peer Debriefer B was the Success Center instructor who supported this study during the design stage, served as a peer debriefer for the interviews, and supplied data and reports from the Successful Learning course student and faculty evaluations. Faculty Peer Debriefer C was coordinator of a program with Career Option and Vocational Technical program tracks who had recommended her students and class time for the first focus group. Faculty Peer Debriefer D was a part-time instructor in the Success Center and taught a Successful Learning class. Faculty Peer Debriefers E and F were Arts and Sciences faculty who provided names of students to serve as focus group members.

The handout titled Faculty/Peer Debriefing: Verification of Findings (see Appendix A-7) included the research questions, the definitions of credibility and confirmability, and the five initial emerging themes from the student focus groups. This handout was used as the
basis for the discussions at the interviews. After discussing and signing the Informed Consent Document, the interviews began with an explanation of the handout. I explained to the faculty members and the student that their roles were to assist this researcher in assuring verification and trustworthiness of the findings of this study. For the most part, the comments in this section are from faculty members serving as peer debriefers in the interviews. The student peer debriefer missed his scheduled interview time and, although I made every attempt to make him feel comfortable when he did arrive, his responses were brief and basically affirmative of the emerging themes that I explained to him as outlined on the Peer Debriefing: Verification of Findings handout.

The results of the peer debriefing interviews were transcribed, coded, and organized around the two overarching research questions for this section:

1. What are the changes in learning when individual learners gain knowledge of their preferred learning styles?

   This subsection was titled: Changes in Learning.

2. What do students perceive as the outcome of the LSA tool and training on their educational and personal lives?

   This subsection was titled: Perceived Outcomes.

**Overarching research question 1: Changes in learning**

The faculty members’ comments in the peer debriefing interviews supported the students’ perceptions about their study habits:

*The students in my success groups have really been able to utilize that environmental information from the LSA in improving their study habits. They are choosing classes that fit their best time of day, walking around, having intake, choosing sound or quiet when they study.*
Faculty B went on to say that the two most important emerging themes were

“Students Create Environments Conducive to Learning and Improve Their Study Skills” and

“Students Gain Understanding/Appreciation of How They Best Learn and Increase Satisfaction”:

The first two that you have are the two that I feel are the most important ones. I work with incoming students and they do feel that it [LSA] reflects them, but they also see, “Okay, this is something I can do right now that won’t cost me anything and will help me to do better in school.” ... [Especially] if they had trouble in high school, they take the LSA seriously.

Faculty D commented on how students need to learn to create environments conducive to learning and began by referring to the national No Child Left Behind initiative:

I think that if we expect ... with No Child Left Behind ... if we are in fact going to do that, we have to adjust to the learning styles, because it used to be, we said well, study harder. Well, that doesn’t help him [if] he doesn’t learn by reading a book. He can be a good reader but doesn’t grasp the concepts. He needs the hands-on. If we’re aware of that and are willing to make the adjustments, and the students now know that there are some things that they can fluctuate, maybe not in class. They can’t change an instructor who doesn’t want to change. But they themselves, once they’re outside of class, they can use the LSA information to study, to get into small groups for hands-on, verbalizing ... make a tape, read to it and then listen to it. And the LSA gives them those tools to make adjustments, where up to this point, it’s always been, work harder, study a few hours a day. Well, that doesn’t work with [all] students.

The fifth faculty interviewee, Faculty F, said it well in responding to his colleague’s comments on the need for faculty to work to create a positive environment and the need for students to take the responsibility also to work on creating a positive environment:

That’s key, because they [students] can’t count on future employers providing them with a particular environment.

Faculty C worked with career option and vocational technical students. She explained how she talked to her students about the learning environment, emphasizing in her interview that
the LSA tool and training gave students and instructors common terminology to improve communication:

It also helped me, as a teacher, to go back, and [help in the] creating and improving of study skills. It’s an easy way for me to challenge students whether they are really working to their potential, because LSA gives me an avenue to say wait a second, it says here that your best environment is to study in quiet, structured, and I never see you in the library.

Theme TWO had to do with the impact of the LSA on grades and stress. Faculty D, the second interviewee, commented on the appropriateness of using the LSA tool and training to ensure an impact at a younger age:

I think if the LSA was presented at the middle school or high school level and teachers understood at that level ... the flexibility that their classes have allows them to [serve] different learning styles.

While conducting the fourth interview, Faculty E indicated agreement with Faculty D as indicated in the following comment:

Students would probably benefit at an eighth grade level or at a high school level for how to best study and how to absorb information.

Overarching research question 2: Perceived outcomes

As mentioned previously, three emerging themes related to the second research question, “What do students perceive as the outcome of the LSA tool and training on their educational and personal lives?” The first emerging theme, Theme THREE, focused on how students gained an understanding and appreciation of how they best learned and improved satisfaction with learning. Faculty B’s reaction to this emerging theme was expressed with comments that included the following:

There are a fair number of students who say that it [LSA] reinforces what they already knew. ... Some get it better then others ... some students thrive at college ... those themes ... so important ... we want them to learn about themselves, but we want them to appreciate it [diverse learning].
Some of the students were very familiar with their learning styles before they got here, but in visiting with them I tried to stress that they can now appreciate how differently other people learn.

When I shared that many of the student participants commented that their study habits were ingrained and they wished they’d had the training in middle school or high school, Faculty B continued as follows:

... Or they have struggled, and now they see the light of how much easier is it when they understand themselves better.

Faculty D also commented on the students gaining an appreciation of how they and others learn:

A lot of them [students] said they knew this, and they knew what was best for them, but that they didn’t realize what’s best for them may not be best for somebody else. They knew their learning style and adapted to it through the years but they didn’t realize how learning styles worked with other people. Last year they had a professor that lectures ... to them it didn’t work ... now they realize some students do learn that way. So it’s not like the instructor’s not doing something right; they’re doing something that’s right for some of the people. The instructor will vary, maybe lecture, small group, large group, whatever. Over a period of time, everybody’s learning style will be involved.

Comments from Faculty C indicated that students learned there was no right or wrong way to learn and referred to gained confidence:

Again, the non-threatening way that LSA is presented, there is not right or wrong. As you go around the room, you find that there are lots of different places on the continuum where they (students) fall. So it’s okay ...

It shows them that there is not set way to learn, that we’re all capable of learning and all have ability. Maybe we haven’t reached our potential because we weren’t utilizing some of these.

We have [students] gaining knowledge and appreciation and increased confidence ... confidence in some of the things that you have strengths on. But it’s also an increased awareness that there are different ways about it. So, I think it’s helpful.
Faculty C went on to comment about what she learns by being in the classroom when the
students receive their LSA tool and training:

*I've done it both ways [been present or not when students receive LSA tool
and training], and I've found ... that students like it more when I'm in there.
For example, when they start talking ... my students can already tell you
where I'm at. ... They like to re-confirm ... the balloons (this game determines
if an individual is right or left-brain dominant), the different elements. It
helps them to process, to start analyzing about learning styles.*

Faculty E and Faculty F were both Arts and Sciences faculty and due to time constraints
requested that they meet with me at the same time for their interview. Faculty F was
impressed that students felt their grades improved:

*Some of them felt their grades improved. That’s the best part.*

Faculty E continued on with the following thought:

*And that they did it themselves. By understanding themselves better, being
validated, they’re no longer looking at themselves as being not the brightest
student in the class, but that they need different information input.*

The faculty members showed great interest in the emerging Theme FOUR, teacher
influence, and wanted to know more about the students’ thoughts and motives as the focus
group discussions evolved. Faculty Peer Debriefe B related a situation where students
commented on a teaching style of an instructor:

*In my online class ... I asked for a summary of how they’ve used the LSA. One
person posted a question as to whether learning styles are being used in the
classroom or not and if teachers teach to a wide variety of learning styles.*

When I asked Faculty B if she thought the community college where this study took place
should have been more emphatic about faculty involvement in the LSA tool and training, her
response was as follows:

*It [faculty response] was pretty good. You’re not going to have 100%
support, but through word of mouth, they can see that something exciting is
going on, and they want information.*
Later in the interview, when asked for other thoughts or observations, she continued with her thoughts:

Have faculty more involved, it's true; the faculty teaching Successful Learning [course] are working with the concepts. It will become second nature to them. Besides encouraging students to learn how they learn best, the faculty is adapting some teaching so students understand.

In addition, Faculty Peer Debriefeer D discussed the teacher impact on the LSA process:

So the LSA will help instructors as much as it helps students if they take it to heart and realize that what they're doing is really going to impact the students to the point where you can't leave them behind. In the 50's and 60's, if you didn't make it in school, you'd go out and get a job in industry. Well, those days are gone. Everyone has to have the ability to communicate and problem solve. So with learning styles on both sides, they can learn how to adjust their classes and students can learn how to adjust their learning, so that they get the best opportunity in the class.

Later in the interview, Faculty D added more concerning faculty involvement and their ability to change and adapt:

I hope teachers become more involved, that we can have time for workshops and things ... everyone gets in their own niche ... people don't want to change, change is difficult. The LSA can do that [help teachers overcome the fear of trying something new]. If a person learns best by listening, or is a good note taker, when they become a teacher, that's what they're going to do because it worked well for them. Need to look at the learning styles of other people.

During the third peer debriefing interview, Faculty C goes beyond the need for faculty involvement and explains the impact of the LSA tool and training on faculty and student communication:

The biggest plus of the LSA is that it opens up a communication avenue for the teacher and the student.

I don't think students are real comfortable talking about their strengths and weaknesses in learning. What it does is provide a nice avenue for that discussion. If something comes out in a very non-threatening way ... it's a lot easier for that student to express why they're not doing well. So as an advisor, I see that happen a lot. Students will come in and they'll express, "I'm not doing well in the class because it's pretty much an auditory
[approach], and the LSA says that I’m visual,” so it opens up some discussion that we can have there. And I think that’s where you’re seeing that student impact is in those discussions. We can talk; guess what, about “how do I teach?” These things are based on my learning style. So it’s not a personal teacher-student conflict.

Later in the interview, Faculty C shared comments that she heard when doing group advising.

Students chose courses and course sections based on the teaching style of the instructor:

[Students don’t say], I don’t like this person or this is a better teacher, or this one’s easier, but did you know that she does a lot of in-class worksheets? So people take that [if it is their preferred learning style].

I asked if, in other words, students are making choices for the right reasons. Faculty C responded as follows:

We’ve been taught that more hands-on is better; we need to get away from lecture. But I think the big thing on LSA says it’s not [necessarily] true. It depends on the audience. [For example] we have an English teacher that does a lot of hands-on, and I have to tell you, some students want more structure than that.

Faculty Peer Debriefee E took the discussion about the teacher impact emerging theme to a new dimension. She found herself with a new attitude and a proactive approach to students:

It used to bother me in class and I used to ask, “Why aren’t you taking notes?” And the student will say, “I found out that I learn better this way, because I pay attention and focus on what you’re saying and then later I put it into my own words, rather than writing verbatim.” So that’s impacted the way I look at students. Instead of being judgmental that they’re not focusing, I’m taking into consideration that they might learn differently.

Faculty E also observed that the discussion by students on matching learning and teaching styles may have a surprisingly practical result:

I think it’s distributed the students more evenly. Because what’s happening now is that certain instructors have certain styles. And if the LSA said that they learn more by listening, for instance, they might prefer to have someone very organized. ... As advisor, if I’ve got a student that says they have problems with writing or papers, and there are two or three different classes open ... mine requires a lot of writing. So, they might want to look and see what the syllabi are for other instructors.
Later in the interview, Faculty E continued her thoughts about program choices:

*I had a student drop out of [program name] and go into another area ... they could not keep up with that type of technical ... they realized that they didn't have the aptitude and that it wasn't their cup of tea after they had gotten into it, because of the LSA. They needed something more interactive, less structured.*

As the discussion about LSA came to an end, Faculty E summarized her thoughts:

*In the long run, the students and faculty will be the benefactors of understanding that there are so many different ways to learn, that we need to become aware of how a student learns, because we have our own biases. And as teachers, we learn to give out the information differently, because it is also our understanding that the student doesn't always receive it the same way.*

The faculty peer debriefers also felt that fifth theme that emerged from the student focus groups, LSA Accurately Reflected Learning Styles, had credibility. Faculty B, coordinator and facilitator of the LSA training sessions used when the completed LSA tool was returned to all students at the college, thought the LSA tool accurately reflected learning styles:

*One of the last things that I've asked before I have them (students) go around [during LSA training session] ... is there anyone who had an LSA that didn't match them. In this past year I had one, and the year before that, maybe one; it is just so infrequent, it's bound to be a very reliable tool.*

As previously mentioned, Faculty B was facilitator of the LSA tool and training Returning Results Sessions, coordinated and evaluated both the entire internal LSA tool and training initiative and the Successful Learning course. Therefore, her contact with students who participated in the college-wide LSA tool and training initiative was extensive and grassroots.

Many of the stories as told by the faculty and reported previously included comments revolving around the five themes and then went further, either giving a different perspective on the student focus group themes or moving beyond them to new perceptions. Additional
comments and thoughts that go beyond the initial five emerging themes are important to note:

The information at the time it's presented, if they will keep this in mind throughout the next two or four years of college, it's going to be really beneficial. And if they keep their copy of the LSA results and remember what works best for them and what the alternatives are. It is probably best in they ... look back at it again, maybe the advisors could go over that with them each fall or beginning of each semester. So they [advisors] could go back and say, here's something, have you been doing this? [Also] remember you indicated that you learn best by hearing or hands-on; where have you adjusted your study?

Theme SIX, Communication Between Students and Faculty, emerged from the faculty peer debriefing interviews:

I think the big thing is creating that communication for learning styles to be discussed; I don't think we've done a good job of that in education in the past.

Yes, in terms of learning styles [have seen an impact of how you can communicate], absolutely.

The faculty members involved in the peer debriefing interviews provided thick descriptions and meaningful feedback on the emerging themes from the student focus groups. The next section describes the results of the student and faculty evaluations of the Successful Learning course taken by all incoming full-time students at the college in this study.

Successful learning course evaluations

The community college in this study initiated a Successful Learning course in the Fall 2001 for all entering full-time Arts and Sciences program students; the LSA tool and training is a part of the course curriculum. Faculty B designed, implemented, and analyzed a student and a faculty course evaluation for the college. The Fall 2001 and Fall 2002 data and reports were provided to me for use in this case study.
The results from the Successful Learning course evaluations were considered as this study was designed, the research questions were developed, the focus group questions were written, the data were sorted and coded during the analysis stage, and the results of the analysis were reported in the results stage and included in the conclusions. The specific sections of the student evaluations used for this study were the open-ended questions relating to LSA, related tabulations, and the rankings from the scalar section. All results on the college reports were crosschecked from the original data sources to ensure accuracy and to enrich understanding. The results also included limited anecdotal comments about the LSA from the faculty evaluations.

The results discussed in the following two sections were organized around the two overarching research questions used in this study:

1. What are the changes in learning when individual learners gain knowledge of their preferred learning styles?

   This subsection was titled: Changes in Learning.

2. What do students perceive as the outcome or affect of the LSA tool and training on their educational and personal lives?

   This subsection was titled: Perceived Outcomes.

   Within the overarching questions, the results were organized around the emerging themes. Results from both Fall 2001 and 2002 were reported as one. The specific question asked on the student evaluation was, “Has LSA made a difference in terms of how you approach your other classes? Why or why not?”
Overarching research question 1: Changes in learning

Theme ONE, Students Create Positive Environments, included the category of improved study habits. Students who took the Successful Learning course related the changes in their study habits due to the LSA tool and training. In addition, responses indicated that the students were learning to study in different ways and in different environments. Examples from Fall 2001 were:

Yes, now I know what I do with certain things. Like how I study and what kind of time I take to do it. It showed me areas where I could change.

Yes, it helped my study skills, which have helped me in other classes.

Yes, it told me how to study better.

Yes, [LSA] showed me what I do best at studies.

Kind of, I see ways I can improve my study skills.

I think so; my study environment was better determined.

Yes, because I study a lot better than I used to.

Yes, because it helps with studying and note taking.

Yes, it has helped me to do better in them, I took a different approach.

Yes, because I know how to study for each of my classes for tests.

I have learned many ways to deal with my new environments.

Somewhat, I became more aware of how and where I like to study.

Yes, it showed me ways to improve the way I learn.

Fall 2002 results were similar:

Yes, I know how I study best!

Yes, it helped me to concentrate on my study skills and learning techniques.

Yes, it affects the way I study and listen.
Yes it has; it made note taking and test taking much easier.

Somewhat, I have started to study differently and in different areas.

Yes, the LSA helped me find the best way to study.

Yes, I take tests better; I study harder and in a better atmosphere. It has improved other classes.

Yes, I realize more how I can learn and study better.

Yes, in high school I didn't care at all because I really didn't know how to do something like test-taking and note-taking skills. I approach teachers a lot better now, too.

Yes, I am able to focus on part of the lecture that are harder to grasp.

It gave me a lot of things about myself. I've learned ways of taking notes and how to act in certain classes.

It should be acknowledged that the Arts and Sciences students involved in the Successful Learning course were also exposed to other tools besides the LSA tool and training, such as the Noel-Levitz inventory. In addition, the course text, college counselors, and instructors provided additional information on note taking, test taking, and time management.

The Successful Learning students also reported that their grades were affected positively and that stress decreased due to the LSA (Theme TWO). The Fall 2001 results were as follows:

Somewhat, it tells me what I need to do to try to maintain good grades.

Yes, I know how to study better and deal with stress and time management.

Yes, I learned to overcome test anxiety and learned ways in which to help me study better.

One student reported that the LSA did not make a difference in the approach to classes due to old habits:
No, because it's hard to change your ways when you've been doing it that way for so long.

The Fall 2002 results were:

Yes, because now I feel I can feel more relaxed, like when I have to ask a question.

Yes, not as worried about problems I've faced because other students are going through the same.

Yes, I can deal with things that come up better.

**Overarching research question 2: Perceived outcomes**

The Successful Learning course evaluations included comments relating to the second overarching research question, "What do students perceive as the outcome of the LSA tool and training on their educational and personal lives," and Theme THREE (Gained Understanding and Confidence) and Theme FOUR (Teachers Influence) (see Appendix B-5).

The Fall 2001 evaluation results included comments from students who reported increased confidence and appreciation for how they learned (Theme THREE):

*The LSA opened my eyes to things that I didn't even realize about myself.*

Yes, because it had made me stop and think about what I have to do to succeed in the class the way I want to.

Yes, because it really makes you think about getting your act together and wanting to achieve these grades.

Yes, it made me more confident.

Yes, I approach classes with a better attitude now.

I know what my strengths are.

Yes, it made me more confident to take tough classes because I know I can handle it.

Comments from Fall 2002 were similar:
Yes, better study habits and confidence.
Yes, made me more aware of what areas I can improve upon.
Yes, now I want to do my best at everything.
Yes, it made me learn how to learn and study and how to tackle subjects.
Yes, LSA helps you understand your learning.
Yes, now I go into my classes knowing what I have to do to get something done because of my learning style.
Yes, helped me identify my strengths and weaknesses.
I've tried to improve in my areas of weaknesses.
It helps me recognize my styles and utilize strengths I have.

A student who did not commit to a definite yes answer shared an increase in confidence as well:

_Somewhat, I still have a hard time, but I study and I have more confidence._

Theme FOUR (Teacher Influence) related to the impact of teachers on the learning experience. Students in the Fall 2001 class stated their reaction to the questions, “Has LSA made a difference in terms of how you approach your other classes? Why or Why not?”:

No, [LSA did not help] because I can’t change the way I learn and most teachers in college don’t do that much hands-on things so I know what they are talking about.

[The LSA] sort of [helped], I now know how teachers expect things and know how to study for exams.

Yes, I know when I will schedule my classes now and what classes are best for me.

Yes, it gives me knowledge to understand the instructor better and to get to know his style of teaching and to know his style of teaching and gives me a better look at my learning style.

Yes, it did make me notice what I do and don’t like about my teachers’ styles.
No comments from Fall 2002 evaluation related to Theme FOUR.

The Successful Learning course open-ended question responses did not include references to Theme FIVE (LSA Accurately Reflected the Students' Learning Styles). It should be noted that the majority of the remaining negative responses to the question, “Has LSA made a difference in terms of how you approach your other classes?” fell into one of the following three categories:

1. Never saw the LSA results.
2. Already knew learning style; already know how to study.
3. Not changing how I do things; study habits are set.

Examples of the reasons given for a negative response to the same question from the Fall 2001 student evaluations were:

Not really because I already know this information.
The same, I kept my same approach to classes and attitude.
No, not really, I’m pretty much set in my ways.
No, my mind set has not changed at all. This class had no beneficial effect on me.
No, because I already knew my learning styles.

The Fall 2002 results included similar responses:

No, I am set in my ways and most of the stuff I did before the LSA told me to do so. I already did it.
No, I didn’t get it back.

Not a lot, I understand them and I just feel confident that I can approach without knowledge of LSA.
Not really, I already knew which kind of environment I need to study and what helps me learn.

No, I feel that I was a good student before.

Other evaluation results

An analysis of the responses to the open-ended question “Has the LSA made a difference in terms of how you approach your other classes?” on the Successful Learning course student evaluations resulted in the information shown in Table 8.

<table>
<thead>
<tr>
<th>Term</th>
<th>Response</th>
<th>Specific</th>
<th>Inferred</th>
<th>Total</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2001</td>
<td>Yes</td>
<td>42</td>
<td>13</td>
<td>55</td>
<td>61%</td>
</tr>
<tr>
<td>N=91</td>
<td>No</td>
<td>30</td>
<td>6</td>
<td>36</td>
<td>39%</td>
</tr>
<tr>
<td>Fall 2002</td>
<td>Yes</td>
<td>53</td>
<td>8</td>
<td>61</td>
<td>64%</td>
</tr>
<tr>
<td>N=95</td>
<td>No</td>
<td>26</td>
<td>8</td>
<td>34</td>
<td>36%</td>
</tr>
</tbody>
</table>

In addition, the student evaluation reports included a rank average for each of the topics included on the evaluations for students who met in face-to-face classes and the students who took Successful Learning as an independent study class. Of the twenty-one topics covered in the course, the LSA ranked fifth in Fall 2002 and sixth in Fall 2001 as the most beneficial topic.

On the evaluations (see Appendix B-6), each topic was ranked with a scale of 0 – 4, with zero meaning no benefit and 4 meaning extremely beneficial. In Fall 2002, the top ranked topic received an average rank of 2.94; the bottom ranked topic received an average
rank of 1.91; and the fifth ranked LSA received an average rank of 2.89. (In Fall 2001, LSA was ranked sixth with an average rank of 2.706.)

The faculty evaluations of the Successful Learning course did not provide rich data or results because there were not questions that specifically pertained to the LSA tool and training. The only reference in the Fall 2001 report was a comment at a best practices meeting, “[Instructor’s name] utilized LSA throughout the class as follow-up.” The Fall 2002 report included a response to the question, “What ... things ... did you gain from your participation in Successful Learning?” that was as follows: “[I gained from the] LSA, that different students learn differently; try many ways to see what fits the class the best.”

Student testimonies

The results of the student testimonies in this section were not organized around the two overarching research questions because of the limited data. Instead, the student testimonies from the report of the pilot project results to the Board of Trustees in March 2001 were included in their entirety because they were key motivators to this researcher in designing the topic and research questions for this study. To ensure credibility (Lincoln & Guba, 1986) and confirmability (Marshall & Rossman, 1995), the testimonies were also used as multiple sources when coding data for the results of this study.

The two students who gave testimonies were asked to speak about their experiences with the LSA tool and training. They chose their own words; their presentations were not rehearsed with the college personnel prior to the presentation. The testimony of Student A was as follows:

The [name of program and college] is a wonderful program and I guess what I want to say about this LSA program is that I wish I had known about it a lot
sooner before I actually started into the [program name] because the program is very rigorous; there is a lot of reading; there is a lot of things you need to do. ... I sat at home doing my homework and reading and reading and reading and not getting anything and not doing very well on the test. ... With this LSA program I was able to figure out why I wasn't doing as well. And the reason was, I was reading and reading and reading and I was not getting anything, the reason is that I am not a reading person. I do not have a good relationship with my books at all. How I learn is by talking, by getting into groups, by talking things over, talking about problems, going over questions with a group of people, or talking to myself or with my dog or anyone. That's how I learn. I had no idea how I learned best ... this last semester I went through the LSA program ... since then I have taken two or three other tests, using these steps on how they teach you to take tests and notes. On the last two or three tests instead of getting D's or not so great scores I was able to get B's and A's. So, it does work.

Student B gave a very similar testimony:

I want to let you know what I think about the LSA test. It would be a very good test for everyone to take at the beginning of the year. It lets you learn if you're right- or left-brained or a little of both. It gives you a very good learning and studying style. It gives you the time of day that's best for you for studying. If you're a night person, day, morning, that way it gives you the chance to pick out classes during the time of day you would like best. If you need it noisy or quiet, some like to listen to music. It lets you know if it's best for you to study alone or with a group. I feel since taking this test I have a better thinking style. I feel my grades will improve and have improved. ... It has been so true, it's scary.

**Summary**

This chapter presented the case study method and the results of the study in four sections organized around the data sources: student focus groups, peer debriefing interviews, Successful Learning course evaluations, and the student testimonies. The two overarching research questions, the four exploratory questions, and the five emerging themes from the student focus groups provided the structure for the presentation of the results as appropriate.
CHAPTER 5. CONCLUSIONS, RECOMMENDATIONS, AND IMPLICATIONS

Chapter 5 begins with a brief overview, followed by the conclusions, recommendations, and implications based on the results of this case study. The chapter concludes with my final thoughts.

Overview

The purpose of this study was to determine if students, and specifically students from a small, rural Midwestern community college, can learn strategies that enhance their ability to learn, reduce intimidation, and thus manage stress during the learning process in order to maximize learning potential. With this purpose in mind, two overarching research questions and four exploratory questions related to the overarching questions were developed and used:

Overarching Research Question 1: What are the changes in learning when individual learners gain knowledge of their preferred learning styles?

Exploratory Questions:

a. As a result of the LSA tool and training, how, if at all, do learners feel empowered and responsible for their learning, thus, creating environments conducive to successful and satisfactory learning?

b. How, if at all, has the LSA learning experience changed student grades?

Overarching Research Question 2: What do students perceive as the outcome of the LSA tool and training on their educational and personal lives?

Exploratory Questions:

c. How has the LSA learning experience affected students’ satisfaction with the educational experiences?

d. Do students feel more or less stress with their academic experiences?
The case study method (Yin, 1994) was selected for the research framework to provide better understanding of the research focus, with the actual case and the research site serving as a backdrop. The research site was a small, rural, Midwestern community college. Status sampling and snowball sampling techniques were utilized to identify the 33 primary source research participants, 27 students for focus groups, and 6 faculty members for peer debriefing interviews.

Focus group questions were carefully constructed in order to gain insight from the students that would lead to answers to the overarching research questions of this study. A semi-structured interview format was selected for the student focus groups. The data were fractured, coded, and analyzed, with five emerging themes resulting from the students’ perceptions. The emerging themes were included in a handout designed as the basis for the discussion with the faculty peer debriefers and a student debriefer. The results of these discussions were coded and analyzed.

Saturation was reached after fracturing, coding, and analyzing data from the two primary sources (student focus groups and peer debriefing interviews) and two secondary sources (Successful Learning evaluations and student testimonies). Trustworthiness was established by ensuring the design and conduct of this study were based on the four criteria of credibility, dependability, confirmability, and transferability.

Conclusions

Motivation for this study arose from the concern that true learning often eludes students due to ineffective study strategies, poor understanding of teacher expectations, limited knowledge of individual learning preferences, and a general confusion over what is
superfluous and what is meaningful. Almost all students struggle at one point or another in their academic careers (Armstrong, 1999). This case study gave the participants a voice by telling their stories in the context of the emerging themes.

Two overarching conclusions were evident: the LSA assessment tool and training accurately reflected the participants’ learning styles; the LSA tool and training positively impacted the educational process of the students, as well as the faculty who participated. The results of this case study are based on the participants’ stories that have been fractured, coded, analyzed and organized according to the final six themes; the first five emerged from the student focus groups and the final theme emerged from the faculty peer debriefing interviews (see Appendix B-5).

The faculty affirmed the emerging themes and provided verification and trustworthiness to the study. For example, Faculty E challenged me to explain how I addressed my biases in the study. In addition, she asked me what negatives had resulted from the research. I explained that the students voiced their disappointment that not all faculty members participated, nor were they sensitive to their learning styles. Faculty E and I discussed how that was important to the study and that the students’ frustration supported the use of the LSA and the importance of the faculty and students understanding diverse learning styles. This conversation was beneficial to me as the researcher; she caused me to reflect and ensured that I included all points of view in the findings, not just the findings that supported my perceptions.

The faculty interviews gave credibility to the realities discovered and interpreted in this study and assured accurate portrayals (Lincoln & Guba, 1986). The faculty peer
debriefing interviews also confirmed and enhanced the general findings and assured me that the data lead to the implications (Marshall & Rossman, 1995).

The conclusions in this section were organized around the themes that emerged from the responses of the participants from all data sources and my interpretation of the results within the context of the literature review in Chapter 2. The first two themes are related to Overarching Research Question 1 and the final four themes are related to Overarching Research Question 2. The two overarching research questions and the related themes are as follows:

Overarching Research Question 1: What are the changes in learning when individual learners gain knowledge of their preferred learning styles?

Theme ONE: Students Create Environments Conducive to Learning and Improve Study Skills.

Theme TWO: Students Improve Grades and Reduce Stress Levels.

Overarching Research Question 2: What do students perceive as the outcome of the LSA tool and training on their educational and personal lives?

Theme THREE: Students Gain Understanding and Appreciation of How They Best Learn; Improve Satisfaction and Confidence.

Theme FOUR: Teachers Influence the Learning Experiences.

Theme FIVE: LSA Accurately Reflects Students' Learning Styles.

Theme SIX: Communication Improves Between Students and Faculty.

A discussion of my conclusions focused around the six final themes that arose from this study follows.
Theme ONE: Students create environments conducive to learning and improve study skills

The most commonly voiced category relating to this theme was that students learned what environment was needed in order to ensure effective studying and learning; students also reported that they learned how to create a positive learning environment after participating in the LSA tool and training. In addition, many participants reiterated in many data sources that, having gained tools for effective studying, study habits also improved. Two participants stated specifically that they discovered the most effective time of day for studying and learning.

One of the student testimonies from the presentation to the Board of Trustees after the college pilot project stated, "How I learn is by talking, by getting into groups, by talking things over, talking about problems, going over questions with a group of people, or talking to myself or with my dog or anyone." According to Watson (2001), self-explanation is the best method for remembering material. Explaining material to herself as she read improved this student’s ability to understand and to remember; she learned to improve her study skills as a result of the LSA tool and training.

Faculty confirmed my findings that students had increased their ownership in the learning process by knowing, communicating and creating more positive environments conducive to learning and improving their study skills. Specifically, Faculty B definitely thought this was an important emerging theme, because students tried new approaches as they utilized the environmental information learned by the LSA.

The “environment needed” section of the LSA tool included several elements relating to where students prefer to learn something new or difficult. Examples from the tool include:
prefer a quiet location or prefer noise (music); in a formal setting or an informal setting; and working alone, in pairs, on teams, or in a group.

Research refers to twelve general theoretical principles (Caine & Caine, 1997) for brain-based learning. The second principle explains that the brain is a social brain, and our identity is dependent on finding ways to belong and establishing community. Students in this study voiced an appreciation of the need for individuals to establish a unique environment conducive to their learning needs.

The LSA tool and training gave students the knowledge to make decisions on what their individual preferences and needs included. Comments ranged on a continuum from “I need to study alone, study in a quiet library,” to: “I need to talk out loud, need to study in with a group.”

**Theme TWO: Students improve grades and reduce stress levels**

The majority of the students in this study not only were thankful for the LSA tool and training, they wished that they had taken it sooner: “before their study habits were so set in stone.” A faculty peer debriefer also supported the students’ aspirations to see the LSA tool and training used in the middle schools or high schools. Students directly mentioned that their grades improved and that stress declined. Faculty F was thrilled that students expressed improved grades: “I’m impressed ... some of them felt their grades improved. That’s the best part.”

With regard to reduced stress levels, I believe this research indicated that the LSA tool and training was effective in improving study habits, decreasing stress levels, and ultimately, improving grades. “Learning styles emphasize the different ways people think
and feel as they solve problems, create products and interact. Learning style models tend to concern themselves with the process of learning: how individuals absorb information, think about information, and evaluate results" (Silver et al., 1997). “Paralyzing experiences” was a term used by Armstrong (1994) to describe experiences that “shut down” intelligence. Shame, guilt, fear, anger, and other negative emotions act as “paralyzing experiences” that prevent our intelligences from growing and thriving.

Theme THREE: Students gain understanding and appreciation of how they best learn; improve satisfaction and confidence

Theme THREE included several important categories. As a result of the LSA, students determined whether they were right or left-brained dominant when approaching something new or difficult. In addition, they reported that they gained knowledge about which modality was their preferred way to take in information: auditory, visual, tactile, or kinesthetic. This new appreciation appeared to assist them in dealing with the learning process and to be more patient with themselves and others as they understood that different approaches to any given situation were required by each individual.

I was rewarded to hear that students’ satisfaction with learning and their confidence in the learning process increased. “There is no right or wrong way ... this is how I learn, and it is ok.” Gaining an appreciation of how others learn helped participants understand why others approached learning successfully in ways other than their own approach and that teaching techniques used by their instructors that were not helpful to them provided effective learning for other classmates.

Students in general, according to Faculty D, wished that they had taken the LSA sooner. Even those who felt they knew their learning styles were able to better adjust and
gained an appreciation for other students' learning styles and their instructors' teaching styles.

The research conducted in the area of learning styles demonstrates that individuals learn in different ways. Personal motivation and performance play key roles in determining an individual's learning style (McCarthy, 1980). For example, the fifth principle from the brain-based research by Caine and Caine (1997) indicated that *emotions are critical to patterning* and our attitudes and feelings influence what we learn; our emotions impact our ability to remember and recall information (Rosenfield, 1988). Therefore, an appropriate emotional climate can significantly impact student learning. In addition, the eleventh principle, *complex learning is enhanced by challenge and inhibited by threat* related directly to Theme THREE (Students Gain Understanding and Confidence), because the brain functions most efficiently when appropriately challenged in an environment that encourages risks. Conversely, learning is inhibited by perceived threat or stress, known as "downshifts" (Hart, 1983). Portions of our brain become inaccessible and are less flexible under threat. However, the brain functions at optimum levels in an environment of relaxed alertness involving low threat and high challenges. This research also supported Themes ONE (creating a positive environment) and SIX (improved communication between faculty and students).

**Theme FOUR: Teachers influence the learning experiences**

I was surprised when participants expressed frustration with instructors who were not involved with the LSA tool and training. Students felt it was the responsibility of the faculty to be sensitive to student needs. However, this frustration reinforced the importance of the
LSA tool and training in the minds of these students and supported the foundation for this study. Another surprise came when I realized that students, and this was confirmed at the faculty interviews, now discussed choices of course sections with fellow students on the basis of the instructors’ teaching styles.

Theme FOUR was of particular interest to the faculty in the peer debriefing interviews. One faculty member specifically asked about whether this was a negative finding, but after discussion they could see that it was a positive finding in that it gave students an opportunity to communicate on faculty preferences in a positive way. My perception was that the students were being more professional in their advice to other students and appreciating that differences in styles exist, versus making general references to teachers that were “bad” or should be avoided. In addition, Faculty B, who had presented numerous Returning Results Sessions to students, reported that the LSA tool and training had helped faculty appreciate that there is more than one way to learn and that it was also beneficial if the instructors were in the room during the presentations, because student response and active participation improved. Faculty C also felt strongly that it was a benefit to be in the seminar class with her students when they received their LSA tool and training. Faculty D felt the LSA would help the instructors as much as the students if they would “take it to heart.” I was impressed by the reaction of the faculty to this theme as they worked to understand the students’ points-of-view and took responsibility for their roles in the success of the LSA tool and training. As a result of the LSA tool and training, the faculty had become less judgmental of diverse needs and learning styles of the students.

Research has documented the influence teachers have on the student learning process. Dewey (1933) advocated that teachers should create attitudes favorable to effective learning.
Furthermore, he believed that it was critical to arrange subject matter around student interests to enhance learning. When the process is too controlled, he felt that learning results decreased. A progressive teacher encouraged Peter Drucker during his youth to record his learning expectations weekly in a notebook. At the end of each week, Drucker was instructed to compare his expectations to the results. Gardner's theory of multiple intelligences implicitly suggests this approach. Learners should be encouraged to concentrate on their strengths and learn from their successes, versus concentrating on their weaknesses and mistakes (Beatty, 1998).

**Theme FIVE: LSA tool and training accurately reflects students' learning styles**

This case study focused on a small, rural, Midwestern community college that used the LSA tool and training in fulfilling their mission to assist their students in obtaining the skills needed to be the best lifelong learners possible. As previously stated, the LSA tool and training was developed by Prashnig (1998) based on research done by Dunn and Dunn (1993). The validity of the LSA tool and training is important to ensure trustworthiness of the study results.

Although not asked directly, a majority of the eight students involved in the first focus group voiced their satisfaction with the accuracy of the results of the LSA. Two students in this first group voiced the concern that it was difficult to connect directly their increased success with the learning process at the college level to the LSA tool and training. Two reasons were stated: They had been involved with several assessment tools since arriving at college and they had an increased commitment to school because of changing family responsibilities. However, both of these students, when asked, said that the LSA tool
and training did correctly reflect their learning styles. Every participant was given an
opportunity to respond to the question of the accuracy of the LSA tool in the second focus
group; the response was unanimous that the LSA accurately reflected their learning styles.

At each Returning Results Session presented college wide to students, Faculty B
reported that she asked students if the LSA accurately reflects their learning styles. Out of
the 1,013 student participants in Fall 2001 and the approximately 1,000 student participants
in Fall 2002, she can remember only one or two each time that indicated that the LSA tool
did not accurately reflect their learning styles. The responses at the college-wide initiative
each fall supported the findings of the student focus groups.

**Theme SIX: Communication improves between students and faculty**

The sixth theme emerged from the faculty peer debriefing interviews and was,
therefore, added to the original five themes emerging from the student focus groups. All five
faculty members elaborated on the benefits of the improved communication, not only from
student-to-student as they selected courses based on the instructors’ styles, but also from
student-to-faculty. Faculty C explained that students felt comfortable talking to instructors
about their needs and challenges related to learning as a result of the LSA. The LSA tool and
training gave the students and the faculty a common vocabulary for voicing learning style
preferences and needs and for seeking opportunities for providing environmental elements
conducive to improved learning. In the words of John Tagg (2003), “in the Instruction
Paradigm we have no construct, no language to describe this ‘overall learning environment’
that includes, but is not limited to, the curriculum and the courses” (p. 94). According to
Theme SIX, the LSA tool and training gives students and faculty the common language needed to shift to the Learning Paradigm.

Fink (2003) compared the old Instruction Paradigm to the new Learning Paradigm using an earlier study by Campbell and Smith. The new paradigm supports seven principles: Knowledge that is jointly constructed; the student as an active transformer of knowledge; a faculty purpose that develops students' competencies and talents; relationships that are personal between students and faculty; a climate where diversity and personal esteem are prevalent; students are empowered; power is shared among students and between students and faculty (Fink, 2003). With the common language provided by the LSA tool and training, students and faculty can successfully communicate and shift to the new Learning Paradigm.

As society and employers in the workplace increase their expectations, today's learners demand new kinds of skills and knowledge from the learning process, which includes the roles played by teachers, employers, and other leaders. Chief among these is the ability to recognize and foster effective learning processes. Today's learning environments, whether the workplace or the classroom, require greater skills in communication, collaboration, and community building (U.S. Department of Education, 1999).

Recommendations

I need to tell one more powerful story shared during the peer-debriefing interview with Faculty C:

I had a student who thought she had learning disabilities. After we met, what she wanted to do was to sit in a place where she could read the test questions out loud. On multiple-choice [questions], she said I really need to hear it. And, we both laughed, because the LSA, it said she was auditory. So instead of having her assessed for a learning disability, she went in my office to take her tests. She needed a place to read these out loud. So, if she had a
question, especially essay, where she had to formulate a string of comprehensive thoughts, she said it's so much easier if I can talk to myself. Here was someone who though she wasn't bright and had a learning disability, when she just confirmed [by the LSA] she needed to hear it. ... Here is a student that it was presented to me that she wasn't going to be successful. She needed a learning tool that matched how she processed information. The LSA helped me on that. Where would I have sent her before? After the first test she asked to sit in a quiet room where she could read the test out loud, she needed to talk through the difficult ones ... the LSA gave her a chance to do that; her confidence level increased, like your research is showing. LSA gave us that communication tool.

Faculty C and I were both moved by this story. I prompted her to continue her thoughts. She went on to explain that the student would not have stayed in her class. She truly believed that if the student had not had the opportunity to discuss the questions during tests, she would not have stayed a [name of area of study] major. I asked Faculty C if she thought the student would have the skills it took to survive in the workplace. The response was as follows:

*Yes. As you look at it, we all do certain things to adapt. Like if someone's talking in a meeting, do I make an outline of what they're saying? Will she be the type that will go in her office and shut the door to have these conversations with herself [or talk to a trusted colleague] to process and make decisions? You bet.*

This story affirms my conviction and recommendations:

- The community college in this study should continue to use the LSA tool and training;
- Ensure faculty involvement at the college level;
- Develop and assess continuously additional follow-up sessions to re-enforce the LSA tool and training for the students; and
- Reach out externally to encourage the use of the LSA tool and training at middle schools, high schools, other community colleges, and four-year institutions.
In addition to the LSA tool and training, Prashnig (1998) provided the college with a Teaching Style Analysis (TSA) tool and training which has been used on a limited basis by college faculty members. The WSA and the two-hour Discovery Session based on the LSA tool and training (currently attended on a voluntary basis) should be available to all faculty members, especially newly-hired faculty, during the mandatory professional development opportunities provided on a regular basis by the college. More extensive use of the WSA and the Discovery Sessions would ensure increased faculty involvement and support of the LSA initiative college-wide.

Before teaching at the community college, Faculty F had worked for a public agency. He related to me that his former supervisor had asked him what brain-based research and brain-based education were. There had been an article in the local newspapers about the LSA tool and training. This publicity and word-of-mouth planted the idea in the public’s mind that this community college was involved in applying brain-based learning and helping people understand that “different people learn differently” and that “you aren’t stupid in you can’t learn it in a certain way.” Faculty F had a good feeling as a result of this conversation and voiced that the implications for the college and its reputation were positive.

The community college in this study should continue to apply brain-based learning which recognizes that the brain organizes the teaching/learning environment based on complex rules that are unique for each individual (Caine & Caine, 1991). In addition, there is potential for continued development of new tools and applications based on brain-based learning and learning styles research. The LSA tool and training includes a Junior Version for middle school, a Senior Version for high school, and an Adult Version for the college student or lifelong learner. The college should continue to reach out externally, giving
presentations at conferences, elementary and secondary schools, other community colleges, and four-year colleges and universities.

Data from the student focus groups and faculty peer debriefing interviews support the need to develop formalized follow-up sessions to ensure that the students review the LSA tool and training periodically. Further application and understanding of the implications of the tool would be evident for each learner.

To maximize the benefits of the LSA tool and training for all students, follow-up and reinforcement should be discussed, planned, implemented, and assessed on a continuous basis by students and faculty to ensure further understanding and effective application. Keeping in mind the distinction between approach and orientation to learning, students need to encounter deep approaches to learning in form and support structures that are consistent with learning-centeredness, in order to transform their orientation to learning (Tagg, 2003). In the words of one of the faculty members participating in the peer debriefing interviews: "Reinforcement or application of the LSA is critical to students utilizing it on their own."

The community college in this study has presented on the LSA tool and training to K-12 administrators, other community colleges in the state, and conferences attended by educators from four-year colleges and universities on a limited basis. The college has available the LSA Junior for upper elementary and lower middle school students, the LSA Senior for students approximately twelve to seventeen years old, and the LSA Adult Version college students and lifelong learners. The experiences of the students and faculty member participants in this study validate the importance of continuing the initiative to reach out externally with the LSA tool and training.
Implications

According to Stake (1995), a harmonious relationship between the readers’ experiences and my experiences as a result of this case study will cause the data generated to resonate experientially with a broad cross section of readers, thereby facilitating a greater understanding of the phenomenon. This study has implications for students, as well as faculty, who are interested in maximizing learning potential through learning strategies that reduce intimidation and manage stress during the learning process. Implications of this study are as follows:

- Common language gives voice to students;
- Generalizations should be made carefully;
- Additional research to include quantitative surveys of participants, correlation between GPA and LSA usage, validity of the LSA, complementary role of the LSA, MI, and the MBTI; and
- The transition from the Teaching Paradigm to the Learning Paradigm will be enhanced by the LSA tool and training.

With regard to improved communication between students and faculty, I believe this research indicates that the use of assessment tools, the LSA tool and training in particular, gives students a voice in their educational experiences, provides a common language for student-to-student and student-to-faculty interaction, and thus ensures effective communication that builds skills to improve lifelong learning. Without changing the expectations of the curriculum or the desired outcomes, individuals can gain increased learning and knowledge within an environment that is less stressful because of increased confidence.
Generalizations from this study should be made carefully. Whereas the findings of this study were significant for those involved, the study is not without its limitations. This study involved research participants from only one institution, a small, Midwestern community college located in a rural area. The results and conclusions cannot be presumed to be representative of, or transferable to, other similarly sized community colleges. In addition, regional differences could affect the transferability of the conclusions to other areas of the country.

This study was based primarily on the perceptions of 27 students and six faculty members involved in the focus groups and peer debriefing interviews. In addition, the perceptions of the students from the two secondary sources, the Successful Learning course evaluations and the two student testimonies, were included. A different participant sample (for example one with more participants from the Career Option and the Vocational Technical programs and more Arts and Sciences transfer students who did not plan to transfer to elementary or secondary education four-year programs) could have produced different results.

The development of and adherence to the formal case study protocol provided reliability in the results of this qualitative study (Yin, 1994). This study revealed that changes took place in the learning of the students when the individual learners gained knowledge of their preferred learning styles. In addition, the majority of the students in this study perceived the outcome of the LSA tool and training on their educational experiences as positive. The reduced frustration (stress) and the increased confidence with their educational experiences would most likely benefit their personal lives and increase their effectiveness as lifelong learners.
This study provided evidence for additional research on the effect of increased awareness of individual learning styles. While this study revealed that the perceived outcome of the LSA tool and training on participants educational lives was positive, this study did not determine the statistical significance of these effects. Further research utilizing quantitative research methods would be a natural follow-up study. For example, a survey to validate the findings could be administered to a statistically significant sample using the students from the pilot project (Fall 2000) and the students participating in the college-wide initiatives in the Fall of 2001 and 2002. The correlation between the high school and college grade point averages of two groups of students, one group who were involved with the LSA tool and training and one group who were not, should be explored.

Continued research should be done on the validity of the LSA tool and training that was used in the study. Although the LSA tool design was based on the extensive research of Dunn and Dunn, limited field studies have been conducted on the LSA tool specifically.

In addition, the complementary roles of usage of the Learning Style Analysis tool and training, Myers-Briggs Type Indicator, and the theory Multiple Intelligences should be further investigated. Studying the significance to learners if the three tools were used in tandem and/or parallel to each other would be beneficial. For example, one could use MI theory during the early years of education, the age-appropriate LSA tool and training during the middle school, high school, and college experiences, and finally, the MBTI for the college or lifelong learner. According to Evans (2000), learning styles assist students in believing in themselves and their abilities and provide more self-assurance. However, the power of learning styles has been undervalued because of disagreement among theorists. In
order for students to fully benefit from learning styles, higher education should utilize every opportunity to integrate the information into the learning-centered methodology.

I believe that community colleges are in a unique position to become truly learning-centered. An appreciation of diverse learning styles by students and educators improves the form and structure of the community college learning environment. The LSA tool and training has the potential to play a key role in the transition from the Teaching Paradigm to the Learning Paradigm in community colleges and higher education.

Concluding Remarks

In conclusion, the faculty and student participants in this case study concurred that the LSA tool and training accurately reflects individual learning styles. The small, rural, Midwestern community college in this case study should not only continue to use the LSA tool and training for all full-time students, the college should broaden the scope as follows: further develop and implement follow-up sessions for students participating in the LSA tool and training; further explore the role of faculty and implement the use of the Teaching Style Analysis (TSA) available in conjunction with the Learning Style Analysis (LSA) college-wide; continue to expand and present the opportunities available for students and educators in elementary and secondary schools (especially middle schools and high schools), other community colleges, and four-year colleges and universities.

As previously mentioned, generalizations from the results of this study should be made with caution. However, I provided much contextual information and description of the participants and setting in order to ensure trustworthiness of the findings supporting the research questions and the purpose of this study and transferability where appropriate. It was
the intention that the thick descriptions of the patterns present in the data would enable the readers to make decisions about the “fit” of these patterns to other relevant contexts.

The results of this study support the evidence and belief that higher education is embarked on a journey that will shift the focus of education. Fink (2003) believes that higher education is ready for the shift from the Instruction Paradigm to the Learning Paradigm.

During the last decade or so, a number of voices have been predicting that higher education is about to undergo major change and have spoken as advocates of that change. Society and individual learners now have different needs, in terms of both what people need to learn and how they can and should learn. (p. 11)

Fink (2003) explained that learning environments that support powerful learning experiences will prepare students for the world of work by developing knowledge, skill, and attitudes necessary for being effective in one or more professional fields. Chapter 1 outlined Barker’s ten steps of the paradigm shift cycle (as cited in Prashnig, 1998). The research in this study shows evidence that higher education is at a cross roads as we approach steps nine and ten of Barker’s paradigm shift cycle: the new paradigm (the Learning Paradigm) is gaining momentum with stronger support and turbulence wanes as the new paradigm solves problems (students and faculty see the benefits of learning-centered environments).

Students must ensure that they have the skills to be effective lifelong learners. The chief agent for learning in the Learning Paradigm is the learners acting as discoverers and constructors of their own knowledge (Barr & Tagg, 1995). In this study, environments that were learner-centered and learner-controlled were created by students and faculty using the LSA tool and training.

Institutions of higher education have a responsibility to their students (lifelong learners) and their faculty to expand their understanding and application of the research on
learning and to appreciate the power of diversity. According to Gardner (1995), if differences are recognized, knowledge of such differences should be shared with the learner and materials presented in ways that afford each learner maximum opportunity to master the materials. I believe that as a result, learners will gradually assume more responsibility for their own learning; learners will indeed be empowered and energized to be in charge of their own learning. To ensure that community colleges become truly learning-centered, the LSA tool and training can play an important role in a smooth transition from a Teaching Paradigm to a Learning Paradigm.

I am forever changed because of my involvement in the LSA tool and training. Interaction with the students and faculty who participated in this study was a privilege. It was extremely rewarding for me, as researcher, to become acquainted with students in the focus groups and to have faculty members dedicated to enhancing the learning experiences of their students share with me on an intimate level their professional ideas and personal reactions. Their enthusiasm for the topic and their generosity of time was greatly appreciated. For all the future benefactors, you have my deep and sincere thanks.
What is Success?

To laugh often and love much;
To win the respect of intelligent persons
    and the affection of children;
To earn the approval of honest critics
    and endure the betrayal of false friends;
To appreciate beauty; to find the best in others;
To give of one’s self without the slightest
    thought of return;
To have accomplished a task, whether
by a healthy child, a rescued soul, a garden patch,
    or a redeemed social condition;
To have played and laughed with enthusiasm,
    and sung with exaltation;
To know that even one life has breathed
    easier because you have lived;
This is to have succeeded.

Author Unknown
April 3, 2002

Ellengay G. Kennedy
Executive Dean, [Redacted] Campus

Dear Ms. Kennedy:

In response to our phone conversation on March 12, 2002, I am sending this letter to affirm points we discussed. The issues included:

- Barbara Prasluing of Creative Learning Co., Auckland, New Zealand collaborated with me on development of the Learning Style Analysis (LSA) and Working Style Analysis (WSA).
- The LSA tool is based on original Dunn & Dunn research. It is important that field testing continue by Barbara Prasluing on the validity and reliability of the interpretations.
- It is important to get research in the hands of students because the best evidence is in the outcomes of our students.
- Barbara Prasluing is not violating any professional ethics by using the LSA tool as designed by me.
- It is important to ensure that proper training and staff accompanies the usage of the LSA and WSA. Prasluing attended two years of our summer institute for trainers. From what you shared in the phone conversation, Creative Learning Co. appears to have put together an effective training program.

If you have further questions or if I can be of further assistance, please feel free to contact me.

Sincerely,

Dr. Keneth Dunn
Coordinator of Administrative Supervisory Program
Queens College, City University of New York
63-20 Kissena Blvd.
Flushing, NY 11367
For the Daily Announcements

An Iowa State University graduate student is conducting focus groups with [Name] Community College students and faculty who have been involved with the Learning Style Analysis (LSA) tool and training. The purpose of the focus groups is to learn about the affect the LSA has on individual student learning. If you agree to participate in the study, your participation will last approximately 1 to 1 ½ hours. Two focus groups consisting of 6 to 8 students each are tentatively planned for Thursday, December 5, 2002. The first group will be from 11 – 12:30 and the second group will meet 2:30 – 4:00 in the [Name] campus community room. Pizza will be served! If you are interested in participating, please sign up in the [Name] business office as soon as possible. Thank you.
Learning Styles....

Come join the discussion on
How knowing your individual learning style has affected your experience in and out of the classroom

Wednesday, January 15, 2003 @ 1:00pm
Or
Thursday, January 16, 2003 @ 2:15pm

If you can attend and enjoy a FREE Subway LUNCH with us...

Email ekennedy@hickorytech.net
   or kennedye@iastate.edu

Please email by Tuesday for lunch count... come join the fun!
Welcome Back!

One of your instructors recommended you for my focus group discussion on individual learning styles. It would be great if you could join us for a free Subway sandwich lunch and a discussion on how knowing your learning style has affected, if at all, your experiences in and out of the classroom. ([Name of community college] did Learning Style Analysis training with you...don’t worry if you’ve forgotten, we’ll review the concept!)

Participation is completely voluntary and hopefully painless! Any comments made will be kept confidential and will be reported anonymously in my dissertation for my PhD in Educational Leadership and Policy from Iowa State University. Your help with my research would be greatly appreciated.

Tentative dates and times:

Wednesday January 15, 2003  1:00pm  
Thursday January 16, 2003  2:15pm

If you would like to join us and enjoy a free lunch, please email:

ekennedy@hickorytech.net  
kennedye@iastate.edu

Please email by Tuesday so lunch can be ordered and details can be sent to you. It would be best to copy the email to both addresses above to ensure effective communication.

If you have a friend that would like to join us, let me know prior to Tuesday also.

*Thanks so much!*

Ellengray G. Kennedy  
RISE Graduate Research Assistant  
E016 Lagomarcino Hall  
Iowa State University  
515-294-1941 (work)  
515-885-2269 (home)
A-5: Informed Consent Document

INFORMED CONSENT DOCUMENT: Written Statement to Participants

Title of Study: Empowering Lifelong Learners through Knowledge of Individual Learning Style
Investigator: Ellengray G. Kennedy, MBA, University of South Dakota, PhD Candidate, Iowa State University

This is a research study in partial fulfillment of the requirements for a PhD in Educational Leadership & Policies from Iowa State University. Please take your time in deciding if you would like to participate. Please feel free to ask questions at any time.

INTRODUCTION: Purpose of the Study
The purpose of this study is to learn more about the affect the Learning Style Analysis has on individual student learning. You are being asked to participate in this study because you are a student or faculty member of [Name] Community College who has used the Learning Style Analysis.

DESCRIPTION OF PROCEDURES
If you agree to participate in this study, your participation will last approximately one to two hours and the location will be [Name] Community College. During the study you may expect the following study procedure to be followed. You will be asked to participate in a focus group or interview about your attitudes towards the Learning Style Analysis (LSA). You may be asked to fill out a follow up questionnaire. You may skip any question during the study or on the questionnaire that you do not wish to answer or that makes you feel uncomfortable. Audio recordings of the focus groups and interviews may be used and will be erased when the study is complete.

RISKS
There are no foreseeable risks from participating in this study.

BENEFITS
It is hoped that the information in this study will benefit lifelong learners and educators by improving the understanding of the impact of the Learning Style Analysis tool and training on individual learning.

COSTS AND COMPENSATION
You will not have any costs from participating in this study. You will not be compensated for participating in this study.

PARTICIPANT RIGHTS
Your participation in this study is completely voluntary and you may refuse to participate or leave the study at any time. If you decide not to participate in the study or leave the study early, it will not result in any penalty or loss of benefits to which you are otherwise entitled.
CONFIDENTIALITY
Records identifying participants will be kept confidential to the extent permitted by applicable laws and regulations and will not be made publicly available. However, federal government regulatory agencies and the Institutional Review Board (a committee that reviews and approves human subject research studies) may inspect and/or copy your records for quality assurance and data analysis. These records contain private information.

To ensure confidentiality to the extent permitted by law, the following measures will be taken. Survey participants will be assigned a unique code and letter to be used on forms instead of names. Password protected computer files will be used to protect the information. Upon completion of the study, codes and letters will be destroyed. If the results are published, your identity will remain confidential.

QUESTIONS OR PROBLEMS
You are encouraged to ask questions at any time during this study. For further information about the study contact Dr. Larry Ebbers, Iowa State University, lebbers@iastate.edu. If you have any questions about the rights of research subjects or research-related injury, please contact the Human Subjects Research Office, 16 Pearson Hall, 515-294-4566, meldrem@iastate.edu or the Research Compliance Officer, Office of Research Compliance, 2810 Beardshear Hall, 515-294-3115, dament@iastate.edu.

PARTICIPANT SIGNATURE
Your signature indicates that you voluntarily agree to participate in this study, that the study has been explained to you, that you have been given time to read the document and that your questions have been answered satisfactorily. You will receive a copy of the signed and dated written informed consent form prior to your participation in the study.

Name (printed) ____________________________________________

(Signature) __________________________ (Date) ________________

INVESTIGATOR STATEMENT
I certify that the participant has been given adequate time to read and learn about the study and that all of the participant’s questions have been answered. It is my opinion that the participant understands the purpose, risks, and benefits of the study and the procedures that will be followed in this study, and has voluntarily agreed to participate.

(Signature of Person Obtaining Informed Consent) __________________________ (Date) ________________
A-6: Thank You For Agreeing To Participate

Thank you for agreeing to participate in this focus group. Feel free to help yourself to refreshments and make yourself comfortable.

What is a focus group?

A focus group usually consists of 6-8 people who have something in common. The purpose of a focus group is to hear about people's experiences around a particular issue.

You were given the Learning Style Analysis (LSA) tool and training when you came to [Name] Community College. The purpose today is to explore your experiences with learning since taking the LSA.

To get started, we would like you to think about the following questions:

"How, if at all, has the LSA experience impacted you?"

"What changes, if any, has the LSA had on your academic experience?"
A-7: Faculty/Peer Debriefing: Verification of Findings

FACULTY/PEER DEBRIEFING: VERIFICATION of FINDINGS
Focus Group Follow Up

Research Questions:
The purpose of the study is to determine if students can learn strategies that enhance their ability to learn, reduce intimidation, and thus manage stress during the learning process in order to maximize learning potential.

- What are the changes in learning when individuals gain knowledge of their preferred learning style?
- What do students perceive as the outcome of the Learning Style Analysis (LSA) tool and training on their educational and personal lives?

Points to Address:
- As a result of the LSA tool & training, how, if at all, do learners feel empowered and responsible for their learning, thus, creating an environment conducive to successful and satisfactory learning?
- How, if at all, has the LSA tool & training changed student grades?
- How, if at all, has the LSA learning experience affected student satisfaction with their educational experience?
- Do students feel more or less stress with their academic experience?

Verification & Trustworthiness:
Credibility is established when the researcher demonstrates that the multiple realities were discovered and interpreted during the study were accurate portrayals (Lincoln & Guba, 1986). Confirmability asks, “Do the data help confirm the general findings and lead to the implications?” (Marshall & Rossman, 1995).

As faculty, the purpose is to provide input as a “peer debriefer” who questions the process and analysis critically. Please comment on the following themes found in the data collected at [Name] Community College student focus groups on January 21, 2003 at the [name] campus.
STUDENT FOCUS GROUP THEMES
Learning Style Analysis Tool & Training

- **Students Create Environment Conducive to Learning & Improved Study Skills:**
  - Learned about environment need
  - Learned to create environment need
  - Improved study habits
  - Discovered time of day best for studying/learning

- **Gained Understanding/Appreciation of How Learn Best & Improved Satisfaction**
  - Determined how learn
  - Learned what modalities are strengths
  - Increased confidence, no right or wrong way
  - Reinforced what already knew
  - Gained appreciation of how others learn

- **Impacted Grades & Stress Level**
  - Wished had LSA tool & training at younger age
  - Grades improved
  - Stress declined

- **Teacher Impact**
  - Helped teachers realize more than one way to learn
  - Selected teacher with complimentary style
  - Recognized that teaching style did not match learning style

- **LSA Accurately Reflected Student's Learning Style**
  - Majority of the 9:00 focus group agreed that the LSA reflected their style accurately.
  - The 3:00 focus group indicated unanimously in a go around that LSA accurately reflected learning style

References


B-1: Learning Styles

College is for learning—but not everyone's learning style is the same. According to type theory, each of the sixteen types has a different style that works best for them. If you are having difficulty learning new material it may be because you are trying to learn in a way that is not consistent with your natural style. Or, you may be using your preferred style so exclusively that you miss the chance to use other strategies when they may be more appropriate. The latter problem is illustrated in the cartoon on the next page. Our intrepid student is so caught up in the use of Intuition that he is in danger of being lost in a world of abstractions.

The table below may help you identify a learning style that is consistent with your preferences. If you already are using your natural style effectively, look at how those with opposite preferences like to learn—you may pick up some additional tips.

### Learning Styles Associated with Each Preference

<table>
<thead>
<tr>
<th></th>
<th>E extraversion</th>
<th></th>
<th>I introversion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Learn best when in action</td>
<td>Value physical activity</td>
<td>Value reading</td>
</tr>
<tr>
<td></td>
<td>Value what is practical</td>
<td>Like to study with others</td>
<td>Prefer to study individually</td>
</tr>
<tr>
<td></td>
<td>Say they have high in verbal and interpersonal skills</td>
<td>Say they need training in reading and writing papers</td>
<td>Say they're below average in verbal expression</td>
</tr>
<tr>
<td></td>
<td>Background sounds help them study</td>
<td>Want faculty who encourage mass discussion</td>
<td>Want faculty who give clear lectures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>S sensing</th>
<th></th>
<th>N intuition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Seek specific information</td>
<td>Use imagination to go beyond facts</td>
<td>Seek quick insights</td>
</tr>
<tr>
<td></td>
<td>Memorize facts</td>
<td>Value what is original</td>
<td>Use imagination to go beyond facts</td>
</tr>
<tr>
<td></td>
<td>Value what is practical</td>
<td>Create their own directions</td>
<td>Use imagination to go beyond facts</td>
</tr>
<tr>
<td></td>
<td>Follow instructions</td>
<td>Like theories to give perspective</td>
<td>Read between the lines</td>
</tr>
<tr>
<td></td>
<td>Like hands-on experience</td>
<td>Want faculty who give clear lectures</td>
<td>Want faculty who give clear lectures</td>
</tr>
<tr>
<td></td>
<td>Trust material as presented</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Want faculty who give clear assignments</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>T thinking</th>
<th></th>
<th>F feeling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Want objective material to study</td>
<td>Want to be able to relate to the material personally</td>
<td>Want to be able to relate to the material personally</td>
</tr>
<tr>
<td></td>
<td>Logic guides learning</td>
<td>Personal values important</td>
<td>Personal values important</td>
</tr>
<tr>
<td></td>
<td>Like to criticize new ideas</td>
<td>Like to please instructors</td>
<td>Like to please instructors</td>
</tr>
<tr>
<td></td>
<td>Can easily find flaws in an argument</td>
<td>Can easily find something to appreciate</td>
<td>Can easily find something to appreciate</td>
</tr>
<tr>
<td></td>
<td>Learn by challenging and debate</td>
<td>Want faculty who establish personal rapport with students</td>
<td>Want faculty who establish personal rapport with students</td>
</tr>
<tr>
<td></td>
<td>Want faculty who make logical presentations</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>J judging</th>
<th></th>
<th>P perceiving</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Like formal instructions for solving problems</td>
<td>Like to solve problems informally</td>
<td>Like to solve problems informally</td>
</tr>
<tr>
<td></td>
<td>Value dependability</td>
<td>Value change</td>
<td>Value change</td>
</tr>
<tr>
<td></td>
<td>Plan work well in advance</td>
<td>Work spontaneously</td>
<td>Work spontaneously</td>
</tr>
<tr>
<td></td>
<td>Work methodically toward goals</td>
<td>Work impulsively with bursts of energy</td>
<td>Work impulsively with bursts of energy</td>
</tr>
<tr>
<td></td>
<td>Like to be in charge of events</td>
<td>Like to adapt to events</td>
<td>Like to adapt to events</td>
</tr>
<tr>
<td></td>
<td>Drive toward closure</td>
<td>Stay open to new information</td>
<td>Stay open to new information</td>
</tr>
<tr>
<td></td>
<td>Want faculty to be organized</td>
<td>Want faculty to be entertaining and inspiring</td>
<td>Want faculty to be entertaining and inspiring</td>
</tr>
</tbody>
</table>

Published by Center for Applications of Psychological Type, Inc.
2815 NW 13th St, Suite 401, Gainesville, FL 32605-2816 800-777-2278
B-2: Focus Group Analysis Worksheet

FOCUS GROUP ANALYSIS WORKSHEET

<table>
<thead>
<tr>
<th>Date of Focus Group</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Location of Focus Group</td>
<td></td>
</tr>
<tr>
<td>Number and Category of Participants</td>
<td></td>
</tr>
<tr>
<td>Investigator Name</td>
<td></td>
</tr>
<tr>
<td>Recorder/Board Name</td>
<td></td>
</tr>
<tr>
<td>Recorder/Field Notes Name</td>
<td></td>
</tr>
</tbody>
</table>

Responses to Questions

Q1. *How has the LSA experience impacted you? Tell me about it.*

<table>
<thead>
<tr>
<th>Brief Summary/ Key Points</th>
<th>Notable Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q2. *What changes, if any, has the LSA had on your academic experience?*

<table>
<thead>
<tr>
<th>Brief Summary/ Key Points</th>
<th>Notable Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Responses to Questions

Q3. Using the knowledge gained from the LSA tool and training, in what ways do create a positive learning environment for yourself?

<table>
<thead>
<tr>
<th>Brief Summary/ Key Points</th>
<th>Notable Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q4. Could you describe for me what, if any, study strategies or techniques you have adopted?

<table>
<thead>
<tr>
<th>Brief Summary/ Key Points</th>
<th>Notable Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q4b. How have the new strategies benefited you? How have your study skills changed? Tell me about the impact, if any, of LSA on your grades?

<table>
<thead>
<tr>
<th>Brief Summary/ Key Points</th>
<th>Notable Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q5. Could you describe for me how your **satisfaction with learning** has changed since receiving the LSA tool and training?

<table>
<thead>
<tr>
<th>Brief Summary/ Key Points</th>
<th>Notable Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q5b. How have you taken **greater responsibility** for your learning? How do you **feel less stress**?

<table>
<thead>
<tr>
<th>Brief Summary/ Key Points</th>
<th>Notable Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
NOTE TO USERS

Copyrighted materials in this document have not been scanned at the request of the author. They are available for consultation in the author's university library.

167

This reproduction is the best copy available.
B-4: Focus Group Questions

Revised Focus Group Questions

OPEN - ENDED

*How, if at all, has the LSA experience impacted you? Tell me about it.

(Could you describe...tell me about...your experience from the time you first took the Learning Style Analysis (LSA)...through the follow-up training session...to today?)

*What changes, if any, has the LSA had on your academic experience?

TOPIC – SPECIFIC

In what ways, if at all, do you use the knowledge gained by the LSA tool and training to create a positive learning environment for yourself?

1. Describe how the environment affects your learning?...in the classroom?...outside the classroom?
2. How, if at all, does knowledge of your preferred learning style help you in a classroom where the teacher's style does not meet your needs?

Could you describe for me what, if any, study strategies or techniques you have adopted since using the LSA?

1. How, if at all, have the new strategies benefited you?
2. How, if at all, have your study skills improved?
3. Tell me about the impact, if any, of LSA on your grades?

Could you describe for me how your satisfaction with learning has changed since receiving the LSA tool and training?

1. How, if at all, have you taken greater responsibility for your learning?
2. How, if at all, do you feel less stress?

What were your expectations? Anything else you would like to share?
EMERGENT THEMES for CASE STUDY
Empowering Lifelong Learners through Knowledge of Individual Learning Process

Theme ONE: Students Create Environments Conducive to Learning and Improve Study Skills
Theme titled: Students Create Positive Environment

Theme TWO: Students Improve Grades and Reduce Stress Levels
Theme titled: Improve Grades and Reduce Stress

Theme THREE: Students Gain Understanding and Appreciation of How Best Learn; Improve Satisfaction and Confidence
Theme titled: Gain Understanding and Confidence

Theme FOUR: Teachers Influence the Learning Experience
Theme titled: Teachers Influence

Theme FIVE: LSA Tool and Training Accurately Reflects Students’ Learning Styles
Theme titled: LSA Accurately Reflects Style

Theme SIX: Communication Improves between Students and Faculty
Theme titled: Communication Improves
## B-6: Student Evaluations – Successful Learning

**Student Evaluation—Successful Learning**

Your comments about Successful Learning are very important to us. It is the only way of knowing if the course accomplished its goals for you. Your feedback will also help us in making any changes for future offerings of the course. Thanks for taking the time to fill this out.

1. Circle one: Class or Independent
2. Circle the location of your class: Estherville, Emmetsburg, Spirit Lake, Algona, Spencer
3. Circle your gender: Male, Female
4. Age _______
5. Circle enrollment status: Full-time, Part-time
6. Circle expected GPA this term: (4.0-3.5), (3.49-3.0), (2.99-2.5), (2.49-2.0), (Below 2.0)
7. Circle one: student living in dorm, live off campus
8. Circle one: I had my Successful Learning instructor for another class in addition to Successful Learning: Yes, No
9. On a scale of 0 (of no benefit) to 4 (extremely beneficial) rate each of the course sessions and aspects of the course. (2=somewhat beneficial)

<table>
<thead>
<tr>
<th>Topic</th>
<th>No Benefit</th>
<th>So-so</th>
<th>Extremely Beneficial</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dealing with Change</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Library Resources</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning Styles</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Management</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notetaking</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neel-LeVitz results</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Studying and Memory</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test-taking tips–objective tests</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test-taking tips–essay &amp; test anxiety</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stress Management</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression Screening</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Convocations</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relationships</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career Planning</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial Management</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Critical Thinking Skills</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diversity</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transfer tips, resumes, scholarships</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community Service</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internships</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other sessions:</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Commons Textbook</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Student Evaluation—Successful Learning

10. Rate the degree to which this course has enhanced or improved each of the following for you. 2 = made better/improved

<table>
<thead>
<tr>
<th></th>
<th>No Effect</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your getting to know other students</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Your interaction with faculty</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Your overall transition to Iowa Lakes Community College</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Your feeling of comfort at Iowa Lakes Community College</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Your confidence that you will succeed at Iowa Lakes</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Your knowledge of how to adapt teaching styles to your learning style</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Your ability to work as part of a team</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Your confidence in reducing anxiety when facing intimidating learning experiences</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>The likelihood of your adapting any learning environment to your learning style</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Your appreciation of diversity in others</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>The likelihood of your attending convocations that are not required</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>The likelihood of your participating in community services at Iowa Lakes Community College</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>The likelihood of your using campus services such as counseling, career center, financial aid, etc.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>The likelihood of your being involved in clubs or other activities this year</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>The likelihood of your approaching a professor when you have a question or concern</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>The likelihood of your applying learning from Successful Learning in other classes</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>The likelihood of your continuing your education at Iowa Lakes Community College</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

11. What was the most helpful aspect of the course?

12. What was the least helpful aspect of the course?

13. What changes would you recommend be made so that Successful Learning could do a better job at meeting your needs?

14. Has Learning Styles Analysis (LSA) made a difference in terms of how you approach your other classes? Why or why not?
APPENDIX C. TRAINING MATERIALS

C-1: Learning Styles Analysis for Adult Learners

Please note: this is not a test. There are no trick questions, no right or wrong answers. By responding as quickly and honestly as you can, you will get the results most useful to you.

Copying Permitted

© 1999 Creative Learning Systems International. PO Box 106 231, Downtown, Auckland, New Zealand
**PLEASE FOLLOW THESE INSTRUCTIONS CAREFULLY**

1. Respond to all statements according to your preferences when you are concentrating, solving a problem, learning something new and/or difficult, or working on an assignment that is difficult for you.

2. Mark statements with T (True) F (False) or U (Uncertain/Uncertain)

3. Add up the number of your T (True) responses for each column in each section.

4. Enter these T-TOTALS in the provided spaces on the LSA Response Sheet.

5. Fax or mail back your results to CLC (see address on response sheet) for processing or enter results into your LSA Adult software programme.

<table>
<thead>
<tr>
<th>1A</th>
<th>I prefer to concentrate or study in a quiet environment.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Outside noise, music and other distractions tend to reduce my concentration.</td>
</tr>
<tr>
<td></td>
<td>People who don't sit still and/or talk in my study area really bother me when I'm trying to concentrate.</td>
</tr>
<tr>
<td></td>
<td>I have to separate myself from all noise and distractions to study or concentrate best.</td>
</tr>
<tr>
<td></td>
<td>TOTAL T-Scores</td>
</tr>
</tbody>
</table>

| 1B | I prefer to have background music on while I am concentrating, reading or studying. |
|    | If the room is absolutely quiet, I have difficulties concentrating. |
|    | I feel comfortable if the TV or radio is on when I study, read or concentrate on something difficult. |
|    | When studying or concentrating, I really like to be in a place where other people are talking or working busily. |
|    | TOTAL T-Scores                                           |

| 2A | I always turn on all the lights in my study area when I am concentrating. |
|    | I like to read or take my difficult learning tasks outdoors into the sunshine. |
|    | I can't concentrate on my learning content in a room with low light. |
|    | When I learn something difficult I prefer to be in a room with direct sunlight or ample overhead lighting. |
|    | TOTAL T-Scores                                           |

| 2B | I prefer to study in a room with dim lighting. |
|    | I like to study, read, or concentrate with most of the lights off. |
|    | I prefer a small desk or table lamp versus bright fluorescent overhead lighting. |
|    | I can easily study, concentrate or read in low light areas. |
|    | TOTAL T-Scores                                           |
MARK STATEMENTS WITH T (TRUE), F (FALSE), OR U (UNCERTAIN)

Add up T (True) Statements only!

3A  I prefer the warmer months of spring and summer as opposed to the colder winter months.
- I learn best in a room with a warm, comfortable temperature.
- I always dress for cooler temperatures, even when I'm indoors.
- I get cold quickly, often freeze and study better in a warm environment.

3B  I prefer the cooler weather months.
- I like the temperature in my classroom or study area to be cool.
- I always wear light clothing when I'm indoors.
- If possible, I adjust the temperature control to a cooler setting while I read or study.

4A  I prefer to read, concentrate or study sitting upright at a table or desk.
- I tend to be less productive if I try to study lying on a bed or on the floor.
- I learn better when I sit with good posture in an upright position.
- I just can't concentrate if I lie down or stretch out when I read for information or study.

4B  I like to sit in a comfortable chair or with my feet propped up while I'm learning something difficult.
- I find it hard to concentrate when I have to be in a formal environment sitting upright at a desk or work table.
- I often sit or lie on the floor while I'm thinking, reading or concentrating.
- I prefer to read/study on my bed or stretched out on a couch.

5A  I enjoy trying new things and often seek new learning opportunities.
- I feel motivated after successfully completing a study assignment or project.
- It's important to me, to my family and/or partner that I am successful in my education, or do well in my studies.
- I find learning stimulating and interesting and always want to learn more.

5B  I'd rather do other things than be in class or study.
- It really doesn't matter to me or anyone else how well I do at school or in my studies.
- My lessons and/or studies do not really motivate or excite me.
- Learning new skills or leisure activities and gaining information does not really interest me.

6A  Once I start a project, I like to work from start to finish and see that it's completed.
- I make every attempt to follow through with every one of my assignments or course projects, even when they are difficult.
- I prefer to work systematically and no one has to remind me to get my assignments or studies done.
- I don't like to stop in the middle of one assignment to start working on a new one.

6B  I get bored when I can't work on several learning projects at the same time.
- Only when I'm really interested, or have a deadline, I can complete study tasks in one attempt.
- People often have to remind me to finish my assignments or study projects.
- When I'm studying or concentrating, I like to stop frequently, take breaks or do something else in between.
MARK STATEMENTS WITH T (TRUE), F (FALSE), OR U (UNCERTAIN)

Add up T (True) Statements only!

6C  I always have trouble completing difficult projects for my studies or finishing assignments.
    - I generally finish most of my learning tasks, but someone has to push me to do so.
    - I always procrastinate, hoping I won’t have to finish projects, particularly when they are difficult.
    - When I take breaks, I usually get distracted and often fail to get back to my original task.

7A  In my studies I always do what I’m supposed to do, or what’s expected of me.
    - I always respect opinions of my teachers or superiors, even if their views are different from mine.
    - I need rules and regulations to work with, and rarely question them.
    - I perform better if I am certain my work will be reviewed by someone else.

7B  I will challenge anyone if we have opposing views and/or I feel strongly about something.
    - I like to do things my own way, sometimes even against the rules.
    - I believe that there is more than one way to get my learning done.
    - I prefer to develop my own ideas and approaches to study tasks.

7C  I always like to do what’s considered right.
    - I don’t have to be reminded to do things and always take my studies seriously.
    - If I make a mistake I usually apologise and try to correct it immediately.
    - I am a reliable person and do my best to keep my promises.

7D  There are other things more important to me right now than studying.
    - Often I don’t keep my promises, regardless of teachers expectations or consequences.
    - I don’t always do the “right” thing and often can’t be bothered correcting my mistakes.
    - As a child, I thought learning was not very important to me, and it still isn’t.

8A  Before I start something I prefer to receive clear directions and tend to follow them closely.
    - For difficult tasks I need clear guidelines, and/or a framework; then I know what to do.
    - I like to be told exactly how to do something, when and where to begin, when I study.
    - If I get instructions in advance, I have no trouble finishing a learning task.

8B  I prefer to learn independently and like to work things out for myself.
    - I usually figure out how to get things done without needing instructions.
    - I do not like receiving directions for my learning nor being told to do something in a certain way.
    - If I am unable to finish something, I reluctantly ask for help and then try to complete it myself.

8C  When I work on difficult learning tasks I tend to follow strict routines.
    - Once I have figured out how to do things, I like to keep doing them the same way.
    - I prefer familiar approaches to problem solving, and function best with pre-set study patterns.
    - I don’t like changes trying out new procedures or strategies and avoid changes in my study routines
MARK STATEMENTS WITH T (TRUE), F (FALSE), OR U (UNCERTAIN)
Add up T (true) Statements only!

8D _ It excites me to try out new approaches to learning and ways of doing things.
_ Rather than following well known strategies
_ I like to change them and find new approaches for difficult tasks.
_ I prefer to study with a variety of people on a wide range of tasks or assignments.
_ I really love change and get easily bored when I have to follow study routines.

9A _ I prefer to study without interaction and concentrate better when I am alone.
_ I don't like studying in project groups
_ I am more successful in learning and study better when I am by myself.
_ I don't need a lot of help from others while learning or solving problems.

9B _ I study or concentrate better with another person present.
_ I am more successful and get more done when I have a partner to study with.
_ I learn more and solve problems faster if I have someone else to exchange ideas with.
_ I like to share ideas or what I've learned with a friend or fellow student.

9C _ I enjoy learning in group/team projects.
_ I prefer to be with a team or project group instead of studying alone.
_ Being part of a team enhances the quality of my learning, my effectiveness and understanding of difficult topics.
_ Working with a team helps me to achieve better results in learning.

9D _ When studying with a group, I find that we all help each other.
_ Working with several people on an assignment or project improves my comprehension and learning.
_ I prefer to develop new ideas with members of a peer group.
_ I am most effective in my studies when I can relate to fellow students or like-minded people.

9E _ I don't need someone in authority to explain how things are done.
_ I feel uncomfortable when my work is being revised too closely.
_ I prefer not to work closely with my teacher/tutor and I don't relate well to people in authority.
_ I'd rather not have discussions with my lecturer before I begin a difficult assignment.

9F _ I really need someone of authority to show me how to do something new.
_ I like a teacher or tutor to review my work regularly.
_ I like to work directly with a person in charge when it's a new and/or difficult topic.
_ I prefer to discuss things with my lecturers/tutors before I begin a complex assignment.

10A _ I remember best by listening or discussing.
_ I can take a lot of information in by just listening to an audio tape or a radio report.
_ I really like lectures and recall information well if someone reads it to me.
_ My comprehension improves when someone talks to me and I learn a lot from listening.
MARK STATEMENTS WITH T (TRUE), F (FALSE), OR U (UNCERTAIN)

Add up T (true) Statements only!

10B _ I remember best when I can explain to
      others what I have learned, read or heard.
      _ Talking out loud helps me to organise
        my thoughts.
      _ I love debating and enjoy participating
        in discussion groups.
      _ For better understanding I need to talk
        things over with someone else.

   TOTAL T-Scores

10C _ I understand difficult concepts more
      easily if I can talk them over in my head.
      _ By talking to myself I often find solutions
        to my study problems.
      _ When I worry I have a lot of negative
        self-talk going on in my head.
      _ I tend to say the words in my head
        when I am doing text reading.

   TOTAL T-Scores

10D _ I remember best by reading or seeing
      information written down.
      _ I prefer computer programmes with words,
        graphs and flowcharts.
      _ I like books and articles with clear,
        precise text and references.
      _ I enjoy solving crossword puzzles
        and/or word games.

   TOTAL T-Scores

10E _ I remember best from watching a
      television programme, video or movie.
      _ I really enjoy computer programmes with
        graphics, pictures and colours.
      _ Doodling helps me to remember what I hear
        in lectures.
      _ I like to sketch, draw charts and symbols
        when working on a new assignment.

   TOTAL T-Scores

10F _ I can learn difficult study concepts more easily
      when I am able to picture them.
      _ I tend to create images in my mind when I worry.
      _ When I have to solve a problem, it is easier for me
        to imagine the outcome.
      _ Visualising what I have heard, seen, or read
        helps me to remember and/or understand
        new information better.

   TOTAL T-Scores

10G _ I prefer hands-on applications and learning
      materials that I can manipulate and move.
      _ I like to construct or build things and I
        really enjoy using my hands.
      _ When I concentrate hard, feel stressed
        or bored, I tend to fiddle or doodle.
      _ Note-taking helps me to learn
        and remember difficult concepts.

   TOTAL T-Scores

10H _ I like studies that require me to be out of
      class or away from my place of study.
      _ I prefer projects and assignments with physical
        activities or involvement in real situations.
      _ I learn best by getting involved - by doing,
        interviewing, experiencing or reporting.
      _ I often do my best thinking when pacing,
        walking or jogging.

   TOTAL T-Scores

10I _ I remember best when I feel positive/good
      about the material I have to study.
      _ Often I understand new learning material
        by how I feel about it.
      _ I prefer to solve problems or make
        decisions based on my intuition.
      _ I judge whether something is right or
        wrong by how it feels inside.

   TOTAL T-Scores
MARK STATEMENTS WITH T (TRUE), F (FALSE), OR U (UNCERTAIN)

Add up T (True) Statements only!

<table>
<thead>
<tr>
<th>Statement</th>
<th>T Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>11A. I can listen/concentrate/read/study better when I have something to eat, nibble, drink or chew, (or when I am smoking).</td>
<td></td>
</tr>
<tr>
<td>I often make trips to the fridge or kitchen when I'm studying, or when I'm bored.</td>
<td></td>
</tr>
<tr>
<td>I tend to chew the end of a pen/pencil, chewing gum, my fingernails (or I smoke) when I'm stressed or concentrating hard.</td>
<td></td>
</tr>
<tr>
<td>I usually feel hungry or thirsty while concentrating, reading or studying.</td>
<td></td>
</tr>
<tr>
<td>11B. I concentrate better on my studies without having snacks or something to drink (and without smoking).</td>
<td></td>
</tr>
<tr>
<td>Chewing/eating/drinking/smoking distracts me when I'm trying to concentrate.</td>
<td></td>
</tr>
<tr>
<td>I never think about eating or drinking when I'm stressed or studying hard.</td>
<td></td>
</tr>
<tr>
<td>I always eat either before or after my learning sessions.</td>
<td></td>
</tr>
<tr>
<td>12A. My concentration and memory are better during the early morning hours.</td>
<td></td>
</tr>
<tr>
<td>I like to get up between 6.00 and 8.00 a.m. or even earlier.</td>
<td></td>
</tr>
<tr>
<td>I prefer to have study or training sessions beginning no later than 9.00 a.m.</td>
<td></td>
</tr>
<tr>
<td>I would rather study early or attend early morning lectures, and finish in the early afternoon.</td>
<td></td>
</tr>
<tr>
<td>12B. If I had a choice I would rather prefer to get up between 8 a.m. and 10 a.m.</td>
<td></td>
</tr>
<tr>
<td>I start to come alive between 10 a.m. and 12 a.m.</td>
<td></td>
</tr>
<tr>
<td>I concentrate best just before lunch.</td>
<td></td>
</tr>
<tr>
<td>I would like to study or work on difficult assignments mainly in the late morning hours.</td>
<td></td>
</tr>
<tr>
<td>12C. I wish my lectures or training could begin right after lunch.</td>
<td></td>
</tr>
<tr>
<td>I prefer to complete difficult learning tasks during the afternoon hours.</td>
<td></td>
</tr>
<tr>
<td>I would rather work on more complicated assignments in the afternoon only.</td>
<td></td>
</tr>
<tr>
<td>I'm most alert toward the end of the (school) day.</td>
<td></td>
</tr>
<tr>
<td>12D. I like to stay up late to do my reading or study.</td>
<td></td>
</tr>
<tr>
<td>Late at night, I am always wide awake and can concentrate best.</td>
<td></td>
</tr>
<tr>
<td>I would prefer to study, or go to lectures during the evening hours.</td>
<td></td>
</tr>
<tr>
<td>I would rather work on difficult learning tasks or assignments after 8 p.m.</td>
<td></td>
</tr>
<tr>
<td>13A. It's really difficult for me to sit still for a long time and I change positions frequently.</td>
<td></td>
</tr>
<tr>
<td>I often need to stand up, stretch and take a short break, then I can continue learning.</td>
<td></td>
</tr>
<tr>
<td>When I'm studying, concentrating or solving problems I prefer to pace around the classroom, my room at home, or down the hall.</td>
<td></td>
</tr>
<tr>
<td>If I could, I would like to stand or walk around during lectures or study sessions.</td>
<td></td>
</tr>
<tr>
<td>13B. When I'm reading or studying,</td>
<td></td>
</tr>
<tr>
<td>I always stay put until I'm finished.</td>
<td></td>
</tr>
<tr>
<td>I rarely change my posture while I'm studying or concentrating on something.</td>
<td></td>
</tr>
<tr>
<td>I like to settle in, get comfortable and finish my school work or assignments.</td>
<td></td>
</tr>
<tr>
<td>I don't move around, I sit quite still and avoid getting up when I'm tackling difficult learning tasks.</td>
<td></td>
</tr>
</tbody>
</table>
MARK STATEMENTS WITH T (TRUE), F (FALSE), OR U (UNCERTAIN)

Add up T (true) Statements only!

14A ___ I like to have an overview or know the reasons and goals for something before I start.
___ My comprehension is better when I get a summary right at the beginning, then concrete examples, and when I feel good about the task at hand.
___ I prefer people who have a sense of humour and a positive view on life.
___ I tend to browse through a magazine or newspaper backwards, often read the end of a book first and then decide whether it's worth reading.

☐ TOTAL T-Scores

14B ___ I prefer lectures and study topics that move in a logical sequence, contain plenty of details and avoid sidetracking.
___ I like details and benefit most from analysing information.
___ I prefer people who stay on task, are serious and don't fool around.
___ I always start at the beginning of a book or magazine, rarely dip into the middle and/or look at the end first.

☐ TOTAL T-Scores

15A ___ I am a quick thinker and get bored if I have to reflect on things for too long.
___ People tell me that I make snap decisions.
___ Most of the time I don't really think before I speak, make a decision, or take action.
___ In conversation I often interrupt and sometimes have the answer even before the question is asked.

☐ TOTAL T-Scores

15B ___ For better understanding I need to reflect on things and I prefer to consider all options before I make a decision.
___ I hardly ever make snap decisions.
___ I always think about the consequences before I take action.
___ When I respond to questions I have to think about the answers first.

☐ TOTAL T-Scores

SCORING

- Please add up the number of your T (True) responses for each column in each section.
- Transfer the TOTAL T-SCORE results on to the provided spaces on the RESPONSE SHEET together with relevant information about yourself.
- Detach and send to the address on the letterhead, or enter results into your LSA Ad™ Software Programme.

Thank You!

By responding to this questionnaire you will be part of an international field study on Adult Learning Styles.
RESPONSE SHEET for LEARNING STYLE ANALYSIS™ for ADULT LEARNERS © Dunn & Prashning International Upgraded Version 630

Please print in BLOCK letters:

<table>
<thead>
<tr>
<th>NAME:</th>
<th>MF</th>
<th>DATE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOME ADDRESS:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CITY:</td>
<td>PHONE:</td>
<td></td>
</tr>
<tr>
<td>EDUCATIONAL INSTITUTION:</td>
<td>ADDRESS:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CITY:</td>
<td></td>
</tr>
<tr>
<td>PHONE:</td>
<td>FAX:</td>
<td>E-MAIL:</td>
</tr>
<tr>
<td>(optional) AGE:</td>
<td>NATIONALITY:</td>
<td>SMOKER: YES NO</td>
</tr>
<tr>
<td>(for statistical data only)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please return this page only or enter scores into your LSA-Adult computer programme

<table>
<thead>
<tr>
<th>SCORING T-TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
</tr>
<tr>
<td>1D</td>
</tr>
</tbody>
</table>
Learning Style Analysis™ - Adult

Dunn & Prashnig
Adult Version 2.3
Serial no. 5011797D

The following profile shows your particular style elements using this key and indicating under which conditions you perform best:

- Strong preference (always needed)
- Preference (needed most of the time)
- Non-preference (avoid if possible/not applicable)
- Flexibility (adjustable to situations)
- Strong adaptability (highly adaptable, influenced by situation/context)
- Inconsistency

This profile allows you to define your strengths in 21 basic areas you have responded to in a series of statements about yourself. You will recognize and be able to control the elements which can make or break your attempts to concentrate, to learn and study effectively and solve problems.

Factors that determine your success are not only influenced by your unique personality, but also by the physical space where you study and concentrate, the time of day, your physical needs, the environment, and your frame of mind.

When your personal preferences are being matched in your study environment and the overall conditions accommodate your learning needs, they become your strengths and will improve your study performance. If, however, you learn through your non-preferences over longer periods of time, they will become your weaknesses. The result can be concentration problems and learning difficulties. True style matches always lead to true learning success!

Reproduced under licence from Creative Learning Systems Int.

For more information contact:
Creative Learning Company, PO Box 105235, Auckland City, New Zealand.
Ph 64.9.309-3701, Fax 64.9.309-3708, Email: wsa@clc.co.nz
# Adult - Personal Profile

## Biologically Based Elements

**ANALYTIC** ("Left")

**HOLISTIC** ("Right")

### BRAIN DOMINANCE

<table>
<thead>
<tr>
<th>BRAIN PROCESSING</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>sequential</td>
<td>simultaneous</td>
</tr>
</tbody>
</table>

### THINKING STYLE

<table>
<thead>
<tr>
<th>Reflective</th>
<th>Impulsive</th>
</tr>
</thead>
</table>

### SENSORY MODALITIES

- **AUDITORY** (hearing)
  - Listening
- **Auditory** (external)
  - Talking/discussing
- **Auditory** (internal)
  - Self-talk/inner dialogue
- **VISUAL** (words)
  - Reading
- **Visual** (external)
  - Seeing/watching
- **Visual** (internal)
  - Visualising/imagination
- **TACTILE** (touching)
  - Manipulating/handling
- **KINESTHETIC** (external)
  - Experiencing/doing
- **Kineesthetic** (internal)
  - Feeling/intuition

### PHYSICAL NEEDS

- **MOBILITY**
  - Stationary
  - Movement needed
- **INTAKE**
  - Not needed
- **TIME OF DAY**
  - Early morning
  - Late morning
  - Afternoon
  - Evening

### ENVIRONMENT

- **SOUND**
  - Quiet
  - Sound/noise/music
- **LIGHT**
  - Bright light
  - Low light
- **TEMPERATURE**
  - Cool
  - Warm
- **STUDY AREA**
  - Formal
  - Informal/comfortable

---

*TL = strong preference
*FL = preference
*FL = flexibility
*NP = non-preference
*SP = strong adaptability
*IN = inconsistency*
Learning Style Analysis™ - Adult

Dunn & Prashnig

Conditioned/Learned Elements

ANALYTIC ("Left") HOLISTIC ("Right")

<table>
<thead>
<tr>
<th>SOCIAL WORKING GROUPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>alone</td>
</tr>
<tr>
<td>team</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AUTHORITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>supervised</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ATTITUDES MOTIVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>self-starting</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PERSISTENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>high/systematic</td>
</tr>
<tr>
<td>low persistence</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONFORMITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>conforming</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RESPONSIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>high/strong</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STRUCTURE/GUIDANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>other-directed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VARIETY</th>
</tr>
</thead>
<tbody>
<tr>
<td>routine</td>
</tr>
</tbody>
</table>

DIFFERENCES BETWEEN BIOLOGICAL & LEARNED ELEMENTS:
The results on page 2 represent your biological needs when concentrating, reading a study text or learning something new and difficult. Preferences and non-preferences in these areas are usually hard to change and remain mostly stable over a lifetime. When they are mismatched over a longer period of time they will influence learning motivation, persistence and achievement in a negative way. For lasting learning success, make sure that your strong preferences are being matched most of the time.

The results on page 3 reveal your conditioning, and show with whom you learn best and what your attitudes are when it comes to learning something new and difficult. These elements might not be stable in your profile and can change quite rapidly. This usually happens when there are changes going on inside you or in the world around you. To be successful in your learning, it is very important that you develop positive attitudes and always attempt to do the best you can because your preferences become your strengths when you use them wisely.

© 1999 Creative Learning Systems International
### Learning Style Tendencies

Compare this with your Left/Right Brain Dominance on page 2

<table>
<thead>
<tr>
<th>ANALYTIC (&quot;Left&quot;)</th>
<th>HOLISTIC (&quot;Right&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>quiet</td>
<td>sound/noise/music</td>
</tr>
<tr>
<td>bright light</td>
<td>low light</td>
</tr>
<tr>
<td>formal study area</td>
<td>informal work area</td>
</tr>
<tr>
<td>high persistence</td>
<td>low persistence</td>
</tr>
<tr>
<td>no/low intake</td>
<td>intake needed</td>
</tr>
</tbody>
</table>

Three or more of the following elements: preferring quiet, bright light, formal work area, high persistence (to complete tasks without interruptions) and low need for intake tend to suggest an ANALYTICAL (sequential) processing style. On the other hand, preferring sound, soft lighting, informal work area, low persistence (completing tasks in spurts while working on multiple tasks simultaneously), and need for intake suggest a GLOBAL/HOLISTIC (simultaneous) processing style (Bruno, 1988; Dunn, Cavanaugh, Eberle, and Zenhäusern, 1982).

### Report Guidelines

**FOR STUDENTS:**
To enhance your study skills, follow the suggestions in your LSA Adult report and monitor your own learning success. To achieve overall improvement in learning and study situations please share and discuss this report with your teachers, tutors or lecturers where appropriate and make sure your learning needs are met.

**FOR TEACHERS, TUTORS, LECTURERS & SUPERVISORS:**
Please help your students to analyse their profiles, discuss their reports and their personal preferences. Find out which areas of mismatch between the teaching styles used at your school/institution and your students' learning needs could be the reason for frustration, stress or boredom, leading to learning difficulties or underachievement.

If it is your own LSA profile, please reflect on the report and your own preferences and find out which areas of mismatch could cause stress and tension in your own studies.

**FOR PARENTS/GUARDIANS:** (if applicable)
To help improve concentration, study skills, and learning attitudes of this student, please follow the suggestions in his or her LSA Adult Report closely, provide the necessary learning environment, accept their unique style and support their true learning needs.
If you act on the recommendations in your personal LSA report, you will not only enhance your learning abilities and problem solving skills, but also improve your academic achievement.

**BRAIN PROCESSING:**
You are quite flexible in your brain processing style. Whether you use a more creative, holistic approach depends on the purpose of the learning task, with whom you do it, and for what reasons. Although you can be quite logical and analytical, you tend to use your simultaneous, right-brain processing style more often than not. This gives you the advantage of being flexible in adverse study situations. When necessary and/or you are interested, you can handle various study projects quite easily at the same time.

**THINKING STYLE:**
Your way of thinking often depends on what you are supposed to do or learn, with whom you study, and mainly on the overall circumstances. You are hardly ever really impulsive in your thinking style and you generally prefer to reflect on things, analysing and contemplating all aspects of a learning assignment. This kind of flexibility enables you to adjust to adverse learning situations but you tend to use reflective thinking more often than not.

**BRAIN PROCESSING - THINKING STYLE:**
Your strong flexibility between simultaneous, more right-brain style and reflective, more sequential style of brain processing and thinking is a definite strength especially in complex, difficult study situations and will usually help you in learning, solving problems and taking in new and difficult information. When you are interested in a study topic your ability to reflect and to handle problems simultaneously definitely increases.

**AUDITORY (hearing):**
You can learn by listening if you are really interested. If you are bored, or have lost interest, particularly in lectures and discussions, you usually don't know what's going on and remember very little. Make sure that you either use your other preferred senses (visual, tactile, kinesthetic), or, even better - a multi-sensory approach to enhance your listening skills and to improve long term recall in lecture situations.
AUDITORY (external - talking/discussing):
You are a talker! When you learn, study or concentrate you really need to interact verbally with people. Talking about issues and discussing ideas - course related or not - definitely switches you on. Rather than just reading about a new topic, you often like to talk about it. Your understanding increases when you can discuss the content with other people and your memory improves when you can explain difficult learning concepts to someone else. One could even say that talking is also very important for your well-being. If you have no-one to talk to you might find it harder to solve problems or sort out complex learning situations. For planning your studies it is important to consider courses which have a high component of communication, interaction and people involvement.

AUDITORY (internal - talking):
You often like to talk to yourself, particularly when you have to deal with tricky study situations or when you have to learn new and difficult material. Your memory improves and your understanding increases when you can have an inner dialogue about it. You probably don't need to talk to other people so much, you rather prefer to have a conversation with yourself - either in your head or out loud. You can be slowed down in your reading because you might be saying the words in your head when you read. Make sure that you avoid negative self talk and that you allow time for discussions with yourself when you study.

VISUAL (words):
You are quite flexible when it comes to information intake through reading. You can remember well when you like what you read or when you find the content interesting. However, when it's not, the information just by-passes you and you might find it difficult to remember. Therefore, reading study texts can often be boring and frustrating for you. Make sure that you use your other senses - auditory, tactile, kinesthetic - to reinforce what you have read and that your other preferences during study sessions are matched.

VISUAL (external - watching):
You can retain a great deal of what you see if you are really interested. If not, you sit through a pictorial presentation or go through pictures without absorbing what it actually means because you are also strongly influenced by the overall situation. For you to create long-term memory it is important that you have a high level of interest for the subject and/or use the multi-sensory approach, combining visual, auditory, tactile and kinesthetic learning activities.

VISUAL (internal - visualising):
You often use your imagination for problem solving, and visualising helps you to remember difficult study content. Your understanding increases when you visualise what you have seen, heard or read. You have the ability to 'see' the solution for difficult learning situations in your mind. To improve your memory, enhance your learning and reduce stress, make sure you take time out to let your imagination flow, or maybe to daydream. Use creative visualisation when you have to take in new and difficult information in learning or study situations. If you tend to worry through negative pictures in your mind, practice positive visualisation.
TACTILE (touching):
Whether you take notes or engage your hands in the learning/thinking process or not depends on how difficult or interesting the study topic seems to you. Sometimes you might fiddle or use your hands a lot, other times you keep your hands still while you take information in, especially when you are highly motivated to learn. The more bored or frustrated you are in study situations, the more you will fiddle or doodle.

KINESTHETIC (external - doing):
You have a preference for practical learning or study assignments. You like being active and involved, and you learn best by doing or experiencing. You might be regularly involved in sports activities and usually you have a high energy level although your movements might not be very fast. Your understanding is greatly enhanced through practical experience, visits, projects, physical activity or involvement in real situations. Try walking back and forth when studying or thinking and even your reading will benefit from moving or stretching your body.

KINESTHETIC (internal - feeling):
You are a feeling person. You tend to rely on your 'gut feeling' more than on your logic in making study decisions and problem solving. Intuition seems to be an important factor in most things you do. Make sure that you feel positive about an assignment and/or reading or learning materials you are dealing with, otherwise your interest and motivation could suffer. You also understand difficult information better when the learning process feels good inside.

MOBILITY:
Whether you need to move while you learn, study or concentrate strongly depends on your interest in the topic or the learning situation itself. When you lose interest or get bored with a learning task you often need to move a lot more, but when you are really excited about learning something, your need for mobility can decrease considerably. However, more often than not, you tend to move your body while thinking, concentrating or reading study texts.

NEED FOR INTAKE:
(Attention: If you are a non-smoker please disregard the comments about smoking - they do not apply to you!)
Your need for intake - eating, nibbling, chewing, drinking (or smoking) - while you learn or concentrate is dependent on what you do, but you prefer to have some intake more often than not. Although you don't always need to eat or drink during your learning or study time, you don't really like to go without it for long periods either. When you are really interested in a learning task you often forget to eat, but when you are bored, you would rather go for snacks than study.
TIME OF DAY: early morning
You are a real morning person! You function best in the early morning hours and your concentration is best between 6.00 and 10.00 a.m. (or earlier). For best study performance schedule difficult assignments for that time. Learning or reading before breakfast can enhance your recall greatly. If possible choose lectures and/or course sessions which are available in the morning. As your thinking is very clear in the early morning hours do your exam preparation at that time and choose morning exams if possible.

TIME OF DAY: late morning, afternoon, evening
These times of the day are not really your preferred ones. You probably find it rather difficult to be fully alert and energetic during these hours and you might find yourself being rather 'brain dead'. If you have to concentrate on study topics during these parts of the day, make sure that all your other preferences are matched and that you do energising physical and mental exercises before you begin difficult tasks. Most importantly - drink water!

SOUND:
The learning task in general and other learning conditions are more important to you than sound. Your need for sound or music while concentrating or text reading is dependent on what you do. Sometimes you need a quiet environment and sometimes you don't. You are very flexible and neither noise nor silence influences your learning ability. This flexibility enables you to adjust to different environments with ease as you are highly adaptable to varying sound conditions and you can study equally well with or without music.

LIGHT:
Your need for light while concentrating or reading is dependent on what you do but you prefer not having too much bright light in your environment. Although you don't always need low light in your study area, you don't really like bright light all the time around you either. However, when you are really interested in a learning task you can learn under any light conditions.

TEMPERATURE:
You have a preference for cooler temperatures and you can think more clearly when it is not too warm in your environment. When temperatures are high, you find it difficult to learn, study or concentrate. It is important that you can lower the temperature in your study area and/or wear clothing which allows you to adjust if necessary.

STUDY AREA:
You have a strong preference for learning or studying in a very formal environment. Your concentration is best when you can sit upright at a desk or table. Avoid lying down or stretching out on soft furniture when you have to tackle difficult tasks - you might fall asleep rather quickly! Formal study areas keep you awake and alert and traditional classroom set-ups with desks and chairs usually will help you learn better.
PAIR:
You really need a friend or fellow student to learn or study with. When you have someone else to solve problems or exchange ideas with, you find it more enjoyable and achieve better results. Make sure that you always have a partner or friend available, especially when you have to deal with difficult and complex new learning tasks.

PEERS:
You definitely prefer to learn or study with like-minded people and your understanding is best when you can exchange ideas or solve problems with a peer group. Because you need frequent social interaction, it is very important for you that you can learn or study with other students who get on well with each other. Your learning and overall comprehension is much better when you can share thoughts about a study topic or issue and discuss the learning content with others who have the same interests.

TEAM:
You are a team player! You learn or study best when you can be in a team with a leader and you find it easy to interact with others. To be most effective you need to talk with team members about learning tasks, problems and possible solutions, to share tasks and participate in group activities. Make sure you can be part of a team learning project, particularly when the topic is new and difficult.

AUTHORITY:
You are quite flexible when it comes to learning with someone in charge. However, you probably prefer to have a supervisor, teacher or tutor to rely on, especially when you are learning something new and/or difficult. To be most effective make sure you get sufficient feedback or just the amount of supervision you need.

MOTIVATION:
You are a self starter! Whenever you have to learn something new, particularly when it's interesting and stimulating, you really enjoy doing it and your motivation is always high. You get a sense of accomplishment from achieving, and this keeps you motivated. It is important for the quality of your learning to have a lot of input in how you go about your studies. You need self-designed goals and objectives, your own pace and self-evaluation of your study progress.

PERSISTENCE:
Your persistence in following through often fluctuates and whether you complete what you start mainly depends on your interest in the learning task or assignment. As soon as you lose interest or get bored you turn to something else. However, when you are really excited about something, your persistence can increase dramatically and you can become very systematic in your approach. It is important that your teachers understand that your persistence depends on how interesting the course and/or study material is for you.
CONFORMITY:
Although you usually do things in a non-conforming way, you might sometimes be drawn to more traditional thoughts, ideas and study methods. Often you decide to do an unconventional thing, but it depends on what it is, how you feel, and whether you can do it your way. Your flexibility in this area might sometimes lead to confusion and unpredictability but it can also be an advantage in helping you to handle adverse study situations.

RESPONSIBILITY:
Your responsibility for carrying out learning tasks and keeping promises mainly depends on the fact that you think it's the right thing to do but you are not always sure what the 'right' thing is. Usually you are reliable and keep your promises, but sometimes you may use excuses and just don't do what you are supposed to do, especially when you have lost interest in a learning task or study responsibility and/or have more important things to do.

STRUCTURE/GUIDANCE:
You don't mind being told what to do or how to do it - in fact, it may feel better for you to know all the guidelines, exactly what is required, and exactly how to proceed. You may learn better with teachers/tutors giving you directions, and you also appreciate frequent feedback. Ensure that you have all aspects of a task clear - this will greatly enhance your concentration and study success.

VARIETY:
You are quite flexible when you have to learn or study under changing conditions. Although you tend to welcome variety and cope well with change, you can also follow routines and familiar patterns, especially when you are interested in your studies. However, for greater effectiveness it is important for you that your other preferences are matched and that you can learn or study with the right balance of variety and routine.
C-3: LSA Returning Results Training Material

[Diagram with various symbols and text related to learning, creativity, diversity, and energy.]
NOTE TO USERS

Copyrighted materials in this document have not been scanned at the request of the author. They are available for consultation in the author’s university library.

192-196

This reproduction is the best copy available.
Analytic vs. Global/Holistic Brain Processing According to the Dunn & Dunn Learning Style Model
SENSORY MODALITIES
and submodalities

VISUAL
- reading
- seeing/watching
- visualising/imagination

AUDITORY
- listening
- talking/discussing
- self-talk/inner dialogue

TACTILE
- manipulating/handling

KINESThETIC
- experiencing/doing
- feeling/intuition
# LSA™ Adult - Personal Profile

## Biologically Based Elements

### BRAIN DOMINANCE

<table>
<thead>
<tr>
<th></th>
<th>ANALYTIC (&quot;Left&quot;)</th>
<th>HOLISTIC (&quot;Right&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>THINKING STYLE</td>
<td>sequential</td>
<td>simultaneous</td>
</tr>
<tr>
<td></td>
<td>reflective</td>
<td>impulsive</td>
</tr>
</tbody>
</table>

### BRAIN PROCESSING

<table>
<thead>
<tr>
<th></th>
<th>ANALYTIC (&quot;Left&quot;)</th>
<th>HOLISTIC (&quot;Right&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>sequential</td>
<td>simultaneous</td>
</tr>
<tr>
<td></td>
<td>reflective</td>
<td>impulsive</td>
</tr>
</tbody>
</table>

### SENSORY MODALITIES

<table>
<thead>
<tr>
<th>MODALITY</th>
<th>ANALYTIC (&quot;Left&quot;)</th>
<th>HOLISTIC (&quot;Right&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUDITORY (hearing)</td>
<td>listening</td>
<td>talking/discussing</td>
</tr>
<tr>
<td>Auditory (external)</td>
<td></td>
<td>self-talk/inner dialogue</td>
</tr>
<tr>
<td>Auditory (internal)</td>
<td></td>
<td>reading</td>
</tr>
<tr>
<td>VISUAL (words)</td>
<td></td>
<td>seeing/watching</td>
</tr>
<tr>
<td>Visual (external)</td>
<td></td>
<td>visualising/imagination</td>
</tr>
<tr>
<td>Visual (internal)</td>
<td></td>
<td>manipulating/handling</td>
</tr>
<tr>
<td>TACTILE (touching)</td>
<td></td>
<td>experiencing/doing</td>
</tr>
<tr>
<td>Kinesthetic (external)</td>
<td></td>
<td>feeling/intuition</td>
</tr>
<tr>
<td>Kinesthetic (internal)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### PHYSICAL NEEDS

<table>
<thead>
<tr>
<th>NEEDS</th>
<th>ANALYTIC (&quot;Left&quot;)</th>
<th>HOLISTIC (&quot;Right&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOBILITY</td>
<td>movement needed</td>
<td>movement needed</td>
</tr>
<tr>
<td>STATIONARY</td>
<td>not needed</td>
<td>not needed</td>
</tr>
<tr>
<td>INTAKE</td>
<td>needed</td>
<td>needed</td>
</tr>
<tr>
<td>TIME OF DAY</td>
<td>early morning</td>
<td>late morning</td>
</tr>
<tr>
<td></td>
<td>afternoon</td>
<td>evening</td>
</tr>
</tbody>
</table>

### ENVIRONMENT

<table>
<thead>
<tr>
<th>MODALITY</th>
<th>ANALYTIC (&quot;Left&quot;)</th>
<th>HOLISTIC (&quot;Right&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOUND</td>
<td>quiet</td>
<td>sound/noise/music</td>
</tr>
<tr>
<td>LIGHT</td>
<td>bright light</td>
<td>low light</td>
</tr>
<tr>
<td>TEMPERATURE</td>
<td>cool</td>
<td>warm</td>
</tr>
<tr>
<td>STUDY AREA</td>
<td>formal</td>
<td>informal/comfortable</td>
</tr>
</tbody>
</table>

**KEY:**
- = strong preference
- = flexibility
= non-preference
= strong adaptability
= preference
= non-preference
= preference
= strong adaptability
= inconsistency
DIFFERENCES BETWEEN BIOLOGICAL & LEARNED ELEMENTS:

The results on page 2 represent your biological needs when concentrating, reading a study text or learning something new and difficult. Preferences and non-preferences in these areas are usually hard to change and remain mostly stable over a lifetime. When they are mismatched over a longer period of time they will influence learning motivation, persistence and achievement in a negative way. For lasting learning success, make sure that your strong preferences are being matched most of the time.

The results on page 3 reveal your conditioning, and show with whom you learn best and what your attitudes are when it comes to learning something new and difficult. These elements might not be stable in your profile and can change quite rapidly. This usually happens when there are changes going on inside you or in the world around you. To be successful in your learning it is very important that you develop positive attitudes and always attempt to do the best you can because your preferences become your strengths when you use them wisely.
The Cornell Method of note taking is a well organized method that works good for daily review, vocabulary words and studying for tests.
<table>
<thead>
<tr>
<th>Planet</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>Closest to Sun</td>
</tr>
<tr>
<td>Venus</td>
<td>Brightest Object</td>
</tr>
<tr>
<td>Earth</td>
<td>Fits Inside Sun</td>
</tr>
<tr>
<td></td>
<td>1 Million Times</td>
</tr>
<tr>
<td>Mars</td>
<td>Red Planet</td>
</tr>
<tr>
<td>Jupiter</td>
<td>Weighs 2x as much as all other planets combined</td>
</tr>
<tr>
<td>Saturn</td>
<td>Rings</td>
</tr>
<tr>
<td>Uranus</td>
<td>42 yrs daylight</td>
</tr>
<tr>
<td></td>
<td>42 yrs darkness</td>
</tr>
<tr>
<td>Neptune</td>
<td>Fastest winds</td>
</tr>
<tr>
<td></td>
<td>2000 km/hr</td>
</tr>
<tr>
<td>Pluto</td>
<td>Surface Temp</td>
</tr>
<tr>
<td></td>
<td>-378 to -398 degrees</td>
</tr>
</tbody>
</table>
PLUTO - SURFACE TEMP -378 TO -398

NEPTUNE - FASTEST WINDS (2000 KM/HR)

URANUS - 42 YRS DAYLIGHT, 42 YRS DARKNESS

SATURN - KNOWN FOR ITS RINGS

MERCURY - CLOSEST TO THE SUN

VENUS - RIGHTEST OBJECT

SOLAR SYSTEM

EARTH - FITS INSIDE SUN 1 MILLION TIMES

JUPITER - WEIGHS 2X AS MUCH AS ALL OTHER PLANETS COMBINED.

MARS - THE RED PLANET
Different colors, shapes and key words. Write the main idea in the center of the page. This enhances memory.

Always move in a clockwise direction.

*MIND MAPPING*

Use arrows to link different ideas.

Use shapes and colors.

Sub-headings should branch out from the center.

The fewer the words the better.
Discovery Session
THE BRAIN BALLOON GAME

© Barbara Prashnig, 1996,
Creative Learning Company, NZ

ANALYTIC QUESTIONS:

1. Do you recall easily what you hear?
2. Do you make decisions based on logic and "common sense"?
3. Do you remember facts and names well?
4. Are you a good planner?
5. Is your work environment tidy and well organised?
6. Are you a very punctual person?
7. Are you good at solving crossword puzzles?
8. Do you prefer doing one thing at a time?
9. When you explain something, do you focus on details?
10. Do you like information presented to you in sequential steps?
11. Can you read quickly?
12. Do you speak with few gestures?
13. Are you fluent in using words?
14. Are you a serious, rational person?
15. Do you use a theoretical or businesslike approach to problem solving?
16. Can you think of synonyms for words easily?
17. Do you mostly think in words?
18. Do you follow your logic rather than your feelings?
19. Do you like reading materials which appeal to your intellect?
20. Is it important for you that things and people are neat and tidy?

HOLISTIC QUESTIONS:

1. Can you recall easily what you see, touch and feel?
2. Do you make decisions based on emotions and intuition?
3. Do you recall places and faces well?
4. Are you spontaneous?
5. Is your work environment disorganised, often in "creative chaos"?
6. Do you have problems being on time unless the event is very important?
7. Do you like fantasy, humour, laughter?
8. Do you like to do many things at a time?
9. When you explain something do you give the 'big picture' first?
10. For better understanding do you need an overview?
11. Do you daydream or remember your dreams?
12. Do you speak with many gestures?
13. Do you like to talk a lot?
14. Are you a creative person?
15. Do you use a playful or practical approach to problem solving?
16. Do you use images when you think or remember?
17. Are you musically or artistically talented?
18. Do you rely more on your feelings than on logic?
19. Do you like reading materials that are fun and have pictures, symbols, colour?
20. Is it difficult for you to keep things 'neat and tidy'?
REFERENCES


ACKNOWLEDGMENTS

I can do everything through Him who gives me strength. Philippians 4:13

Grateful appreciation is extended to my major professor, Dr. Larry H. Ebbers. His insights and mentoring throughout my program of study, especially during this last year of research and work at Iowa State University, have been extremely valuable and greatly appreciated.

To the members of my Program of Study committee: Drs. Robert J. Barak, Sharon K. Drake, Daniel C. Robinson, and Mack C. Shelley; their wisdom and guidance have been invaluable as I completed my degree and, specifically, my dissertation.

To my professors, Drs. Mary Jane Brotherson and Mack C. Shelley; they provided the instruction I needed to gain an understanding and appreciation of qualitative research. Thank you.

To my sister, Susan Gutzman Seipp; her editing and thoughtful suggestions enhanced the quality of my dissertation, and her endless support was invaluable.

To my good friend and former colleague, Julie Carlson; she gave me the strength and encouragement to do what I needed for myself, both personally and professionally, for which I will be forever grateful.

To my former colleague, Laurie Schmidt; her understanding and support of my attempts to begin organizing and writing my dissertation gave me the confidence I needed to undertake the final phase of my program of study.

To my former Iowa Lakes colleagues: Joni Anderson and Lynn Dodge; they were my “sounding board” throughout my research. Also, to Kari Hampe, Kathy Skelly,
Gary Gunderson, and Jim Weipert; for their support of my research, I thank them.

To my Iowa State University colleagues and friends: Lisa Thrane, her insight was greatly appreciated; Bill Nelson, his came along at just the right time to provide the inspiration and the encouragement I needed to turn the corner and begin the final stages of writing my dissertation; and Lindsey, Daphne, and all my colleagues and friends in RISE, they inspired me. To my Ames “family,” Nancy and George Clark, who nurtured me; thank you!

To all my friends who supported me with words of encouragement and prayers, you never stopped giving or caring. Thank you for believing in me.

Most importantly, loving appreciation is given to my family:

Charlie, Patrick, and Stuart
Wayne W. Gutzman
Loisgail Grotenhouse Gutzman
Patricia Doll Gutzman
Eileen Kimball Gutzman
Susan, Kathie, Howard, and Carl
Ellen Gray Tillotson Grotenhouse
Ellengray Grotenhouse

to my husband’s family:
Bill and Alice, Jan, Tom, Teresa, Mary, John, and Robert,

and to all my nieces, nephews, and in-laws.

Your love, support, generosity, patience, and prayers have sustained me!