THE RELATIONSHIP BETWEEN SUPPLEMENTAL INSTRUCTION LEADER
LEARNING STYLE AND STUDY SESSION DESIGN

Joshua Adams, B.A., M.Ed.

Dissertation Prepared for the Degree of

DOCTOR OF EDUCATION

UNIVERSITY OF NORTH TEXAS

May 2011

APPROVED:

V. Barbara Bush, Major Professor
Maureen M. McGuinness,Minor Professor
Kathleen Whitson, Committee Member and
Program Coordinator
Janice Holden, Chair of the Department of
Counseling and Higher Education
Jerry R. Thomas, Dean of the College of
Education
James D. Meernik, Acting Dean of the
Toulouse Graduate School
The purpose of this qualitative study was to examine the learning styles of supplemental instruction leaders at a large, public university during the fall 2010 semester and determine whether or not their personal learning styles influenced the way they designed and developed out-of-class study sessions. The total population of supplemental instruction leaders was 37, of which 24 were eligible to participate in the study. Of the 24 eligible supplemental instruction leaders, 20 completed the entire study. Participants in the study included nine male and 11 female supplemental instruction leaders with a median age of 22.25 years-old. Seventeen participants indicated their classification as senior, two as junior, and one as sophomore. Of the participants, 16 indicated white as a race or ethnicity, one indicated Asian, two indicated African American, and one indicated both American Indian/Alaska Native and white.

Supplemental instruction leader learning style was assessed using the Kolb Learning Style Inventory. Leaders were then interviewed, and their study sessions were analyzed. Through triangulation of data from learning style, interviews and actual study session documents, four major themes emerged. The four themes were: 1) incorporation of personal experience into study session design, 2) the sense of impact on student learning, 3) a feeling of the need to incorporate varied activities into study session design, and 4) the concept that students must take ownership over their own learning. No consistent pattern emerged among the themes; however, the results attributed out-of-class study session design to both the incorporation of personal
learning style preferences as identified through the Kolb Learning Style Inventory and training conducted by the institution.

Implications for future research include the need for continued research addressing how and if supplemental instruction leader learning style influences out-of-class study session design. Also, as institutions of higher education seek to expand academic support services to all students, future research should explore supplemental instruction leader training and the impact such training has on students seeking support from the supplemental instruction program.
Copyright 2011

by

Joshua Adams
ACKNOWLEDGEMENTS

First, I would like to thank my partner, Jake Mangum, for your support throughout this process. I cannot express how much your love and compassion has helped me. Knowing that you are there to lend a helping hand and listen when times are tough means the world to me. I hope that one day I can support you through an endeavor like this!

Second, I would like to thank my daughter, Madison Adams-Mangum. You haven’t been with us very long, but when I needed to escape and have a reminder of why this process is important you were there. Your laughter has changed my life for the better.

Third, I would like to thank my parents, Peggy and David Adams, for your enduring support and understanding during this process. Both of you instilled in me the importance of education and self discovery. Thank you for always being there for me.

Fourth, I would like to thank my sister, Erin Deason. You have always been my rock and foundation. I have always looked up to you and found strength from you. Your support throughout this process means so much to me.

Finally, I would like to thank the members of my dissertation committee, Dr. V. Barbara Bush, Dr. Maureen McGuinness, and Dr. Kathleen Whitson. I look to you all as mentors within this profession and would like to thank each of you for sharing your time and knowledge with me.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>ACKNOWLEDGEMENTS</th>
<th>iii</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIST OF TABLES</td>
<td>vi</td>
</tr>
<tr>
<td>Chapter</td>
<td></td>
</tr>
<tr>
<td>1. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>2. LITERATURE REVIEW</td>
<td>9</td>
</tr>
<tr>
<td>3. RESEARCH METHOD</td>
<td>33</td>
</tr>
<tr>
<td>4. RESULTS</td>
<td>41</td>
</tr>
</tbody>
</table>

## Chapter 1: Introduction
- Problem Statement
- Purpose of the Study
- Research Question
- Definition of Terms
- Significance of the Study
- Limitations
- Delimitations

## Chapter 2: Literature Review
- Learning Assistance Programs
- Supplemental Instruction
- Supplemental Instruction Program Design
- Supplemental Instruction Leader
- Learning Style and Facilitation
- Learning Styles
- Theoretical Frame

## Chapter 3: Research Method
- Population
- Sample
- Instrumentation
- Data Collection
- Data Analysis

## Chapter 4: Results
- Participant Flow
- Demographic Data
- Learning Style Inventory
- Emergent Themes from Individual Interviews
  - Personal Experience and Study Session Design
  - Impact on Student Learning
  - Incorporation of New and Different Elements
  - Students are Responsible for Their Own Learning
LIST OF TABLES

Table          Page
1  Participant Data.................................................................44
2  Reported Supplemental Instruction Subject............................45
3  Kolb Learning Style Inventory Result..................................46
CHAPTER 1
INTRODUCTION

Learning assistance programs, or more specifically, learning centers, have developed over the past 40 years to become a commonly utilized program for enhancing academic support at institutions of higher education (Arendale, 2004). Although tutoring as a means of academic support has existed almost since the inception of higher education, the move to a comprehensive model of learning centers is relatively new. While specific programs and services differ from institution to institution, the overall goal of support for the student population remains central to the mission of the learning center (Council for the Advancement of Standards, 2006; MacDonald, 2004). As Trushel and Reedy (2009) identified in their national survey of academic support programs, learning centers provide different modalities of academic support with 88% of respondents indicating tutoring is one of the support areas provided “to help students help themselves” (p. 12).

One additional academic support program that many institutions of higher education provide for their student population is supplemental instruction. For the past 30 years, supplemental instruction has grown into an international program for which over 1800 institutional administrators from over 30 countries have been trained to offer a supplemental instruction program at their institutions (University of Missouri – Kansas City, 2006; Hurley, Jacobs, & Gilbert, 2006). As a basis for academic support, supplemental instruction has been found to be helpful for students struggling not only with course content, but also with generalized study skills and strategies (McGuire, 2006). Many similarities can be found among supplemental instruction and other such
programs developed on a model provided by the International Center for Supplemental Instruction housed at the University of Missouri Kansas City.

Most supplemental instruction programs are staffed by students known as supplemental instruction leaders. As part of the training provided by various program administrators for these staff; specific, prescribed methods for assisting fellow students are taught. It is then the responsibility of supplemental instruction leaders to adapt these methods into their respective out-of-class study sessions. Through this training and the subsequent development of the design for out-of-class supplemental instruction study sessions, leaders may deviate from the norm in the design of specific elements of their sessions. However, generally, in planning the study session, the supplemental instruction leader should clearly articulate the objective of the session and move toward the creation of a session agenda (Hurley, Jacobs, & Gilbert, 2006). The basic recommendation and “best practice” for the study session is to include one or two learning strategies in the session design (Hurley et al., 2006). In addition to employing the learning strategy in the session design, the supplemental instruction leader should include session planning materials and a separate closing activity for the participants (Hurley et al., 2006).

Supplemental instruction leaders are employed by the Learning Center at the University of North Texas. The Learning Center is an academic support office within the Division of Undergraduate Studies. This center provides multiple modes of tutoring as well as study skills assistance to currently enrolled undergraduate and graduate students. The role of the supplemental instruction leader at the University of North
Texas follows the model described by the International Center of Supplemental Instruction at the University of Missouri at Kansas City.

Problem Statement

While research has been conducted on supplemental instruction leaders and their awareness of different learning styles of students, such as the study conducted by Lockie and Van Lanen (2008), no research can be identified that addresses whether the Leader’s personal learning style affects the design of out-of-class study sessions and whether learning styles have an influence on the supplemental instruction leaders’ approach to this design. Much of the research surrounding learning styles involves how a student utilizes his or her learning style in approaching course content and their personal movement through course content (Claxton & Murrell, 1987). Little to no research has been developed regarding how the supplemental instruction leader utilizes his or her own learning style in their approach to study session design. Without research surrounding if and how a supplemental instruction leader utilizes his or her own learning style when designing out-of-class study sessions, program administrators at the University of North Texas do not have the necessary tools and research base to develop new training programs or interventions for their Leaders.

Purpose of the Study

The purpose of the study was to examine the learning styles of supplemental instruction leaders at the University of North Texas and determine whether or not their personal learning styles influence the way they design and develop out-of-class study sessions. Through an understanding of how and if a supplemental instruction leader’s learning style influences the way in which he or she designs interventions for fellow
students, a supplemental instruction program coordinator can better assist the supplemental instruction leader through introductory and on-going training modules. Further, encouragement of the supplemental instruction leaders in the use of multiple learning style approaches may assist the participating students in engaging more fully in the study sessions and allow the students to better understand the concepts and course content covered in the out-of-class study sessions.

Research Question

For the purposes of this study one major research question is addressed. The research question for this study is:

What is the relationship, if any, between the learning style of supplemental instruction leaders and the design of their study sessions?

This study, being qualitative in nature, focused on the major research question while allowing for additional questions to be asked during data collection (Merriam, 2002; Creswell, 2009). Themes were determined based on the emergent nature of the data collected (Merriam, 2002).

Definition of Terms

The following definitions were used to clarify the study. All definitions are based on literature surrounding the specific term and are consistent with research and literature on the topic.

Supplemental instruction is defined as an academic assistance program that utilizes peer-assisted study sessions. Supplemental instruction sessions are regularly-scheduled, informal review sessions in which students compare notes, discuss readings, develop organizational tools, and predict test items. Students learn how to integrate course content and study skills while working together. The sessions are
facilitated by ‘SI leaders’, students who have previously done well in the course and who attend all class lectures, take notes, and act as model students (University of Missouri-Kansas City, 2006).

Supplemental instruction leader is defined as an undergraduate student employee of the institution who attends class with enrolled students and facilitates out-of-class study sessions throughout the semester on topics covered within the classroom (University of Missouri-Kansas City, 2006). The facilitated out-of-class sessions occur a minimum of three times per week averaging approximately 50 minutes per session. Additionally, the supplemental instruction leader follows prescribed institutional protocol and relevant policies in carrying out his or her duties.

For further clarification, within the scope of this study, any deviation from program norms are noted in the results and discussion chapters of this study.

Study session design is defined as the time and effort a supplemental instruction leader places on developing his or her out-of-class study sessions. As noted before, three out-of-class study sessions per week should be developed by the supplemental instruction leader (University of Missouri-Kansas City, 2006). Additionally, the design of the study session will include planning sheets outlining the processes, approaches, and content to be covered during the study session (Hurley, Jacobs, & Gilbert, 2006).

Learning style, for the purposes of this study, is the supplemental instruction leaders’ personal learning style as identified by the Kolb Learning Style Inventory (2007). This inventory is a paper and pencil based, self-scoring assessment (Kolb, 2007). The most recent version of the Learning Styles Inventory, version 3.1, places additional names on the four developed types of learning styles by Kolb (1981).
Significance of the Study

Supplemental instruction programs have been found to have a positive impact on the persistence and retention of students in barrier courses at the collegiate level (Ogden, Thompson, Russell, & Simons, 2003). While the study is qualitative in nature and not meant to generalize to entire student population, it offers in-depth data from a specific site offering supplemental instruction (Creswell, 2009). Through this study training programs may be better developed and further refined for the supplemental instruction leader. Results of this study may also assist supplemental instruction program coordinators with additional evidence on the effectiveness of the supplemental instruction program. In addition, this study will contribute to the overall literature on supplemental instruction including program design and program delivery as well as the literature on learning styles. It will allow administrators of supplemental instruction programs to have a different perspective on the effect of their supplemental instruction Leaders learning styles and possible influences on the design of their study sessions.

As noted by Claxton and Murrell (1987), research is needed on learning styles in terms of the effect and influence a learning style has on the teacher. For this study, the role of teacher is assumed by supplemental instruction leaders. Further, Pascarella and Terenzini (2005) note that more studies on the benefits of supplemental instruction are needed to further the evidence of effectiveness of this style of academic intervention. While the study does not directly look at the benefits of the supplemental instruction program on student progress, it will contribute to the knowledge base surrounding how supplemental instruction leaders, who are students themselves, develop into leadership roles while attending college.
Limitations

Potential limitations of this study include the size of the supplemental instruction program at the University of North Texas. Additionally, supplemental instruction, by definition, is only offered in courses with a high risk of failure (Hurley, Jacobs, & Gilbert, 2006). This limits the scope of the study in the sense that not every course qualifies for supplemental instruction limiting potential supplemental instruction leaders to individuals who not only have specific qualities, but who are also knowledgeable in a few, specific course content areas. As noted by Kolb (1984), individuals may choose majors that fit their learning styles. A learning style of a certain supplemental instruction leader may not match that of the student attending the out-of-class study session. Further, not all learning styles may be represented in the study based on selection criteria for inclusion in this qualitative study.

An additional potential limitation is the Learning Styles Inventory developed by Kolb (2005). This instrument and the theory on which it is based is one of many learning style inventories in existence. Although theoretically-based, the output from the inventory provides the user with only four choices of learning style. An individual user may feel that he or she does not “fit” within the prescribed learning style. Any disagreement among the sample as to “fit” in terms of perceived learning style and the output from the inventory are noted in the results and discussion chapters of this dissertation.

A final possible limitation of the study is that I scored the Kolb Learning Style Inventories (2007) and was aware of the participant’s learning style when conducting the individual interviews. This knowledge could be perceived as contributing to
researcher bias. However, this limitation was mitigated by the fact that I maintained the established interview protocol for each study participant, regardless of determined style. Additionally, through triangulation of the data from learning style, interviews and actual study session documents the overall study was strengthened (Patton, 1990).

Delimitations

This study is limited to supplemental instruction leaders at the University of North Texas during a specific time period. While in depth analysis for themes was sought, longitudinal data has not been collected. As noted in the literature review, learning styles are intended to be fluid in nature and not fixed (Salter, Evans, & Forney, 2006). Due to the fluid nature of learning styles of the individual supplemental instruction leader, the results and analysis may not be able to be replicated even if the same sample of individuals complete the Kolb Learning Style Inventory (2007) at a later date.
CHAPTER 2
LITERATURE REVIEW

The amount of literature and empirical research surrounding learning assistance and related topics varies greatly. Certain areas, such as learning assistance programs have a great many articles on the topic, but little empirical research. Supplemental instruction, on the other hand, has a fair amount of research conducted on various supplemental instruction programs at different institutions of higher education. More specifically, the research on supplemental instruction tends to focus on the student taking the course, but not the supplemental instruction leader.

Within this literature review the following topics are discussed: learning assistance programs including a brief historical look on the evolution of learning centers, supplemental instruction, supplemental instruction program design, the role of the supplemental instruction leader, research surrounding how learning style affects facilitation of study sessions, and learning styles. Finally, the theoretical frame for this study is introduced and discussed.

Learning Assistance Programs

Learning assistance programs at institutions of higher education have evolved over the years to include many different elements of academic support and have become one of the integral support services institutions of higher education provide for their student population (Arendale, 2004; Dvorak, 2004). Historically, learning assistance programs have evolved with the changing face of higher education with the most recent form of learning assistance taking shape in early 1970s (Arendale, 2004). This, according to Arendale (2004) is the culmination of hundreds of years of
development and a response to the broadening of access to higher education by individuals from multiple segments of the United States population not traditionally included within higher education. The move from the remedial assistance in the form of tutoring for white male students in the early years of higher education in America was complemented by “reading clinics and study methods laboratories” in the 1930s and 1940s (Dean, 2006, p. 237). The shift from remedial education to access for all students without a singular remedial focus began to form current practice of learning assistance during the second half of the twentieth century. This focus on success for all students allowed learning assistance programs to extend their reach beyond tutoring to encompass services addressing the needs of all students of the institution, not just the students struggling academically (Arendale, 2004).

Along with the development of more comprehensive units of academic assistance, learning assistance programs have different names and provide different services and programs depending on specific institutional culture and needs. Within the context of learning support and services for students, institutions have developed similar programs to address the needs of their students, however, the name of this unit as well as the services provided by the unit differ from institution to institution. For example, Truschel and Reedy (2009) note diversity of learning assistance programs in terms of names and program delivery. They found the most popular name for learning assistance programs at institutions of higher education to be learning center with 82.9% of respondents indicating this as their unit name (Truschel, & Reedy, 2009).

With the historical and current development of learning assistance programs, the Council for the Advancement of Standards in Higher Education (Dean, 2006) developed
professional standards for learning assistance programs. These general guidelines offer direction for institutions of higher education when developing and implementing learning assistance programs. This is not to imply that each institution of higher education has the same type of unit considered to be a learning assistance program. Through the implementation and introduction of human development into more traditional learning assistance programs, these programs have developed in significantly different ways than tutoring support of the past (Arendale, 2004).

Opitz and Block (2006) utilize a broad, fluid definition of learning support that allows different institutions to incorporate various components of academic support under the learning assistance program umbrella. They argue for a holistic approach to student learning by incorporating a wide range of student support services into the learning assistance program. This approach to learning support appears to be validated in a survey of 142 colleges and universities by Truschel and Reedy (2009) who found a diverse set of programs and services provided under the learning assistance program model. Examples of such services include: workshops on study skills and strategies, tutoring, academic coaching, academic advising, and disability services. Likewise, MacDonald (2004) agrees that learning assistance programs, and therefore learning center, is an “umbrella term that covers a broad spectrum of both general and specific services” (p. 52).

An important element to learning assistance programs is the need to provide learning and academic support in multiple formats for the student population (MacDonald, 2004). As an example, an institution may provide multiple modalities of
tutoring for a student including individual, group, and online tutoring as well as content based assistance programs such as supplemental instruction.

Supplemental Instruction

Developed in 1973 by Deanna Martin at the University of Missouri at Kansas City, the program of supplemental instruction was designed to increase retention of students in high-risk courses (Hurley, Jacobs, & Gilbert, 2006). Additionally, the program was created in order to improve student performance within the classroom in terms of improved course grades, participation, and overall improvement of study strategies (Hurley et al., 2006). Supplemental instruction has been identified as having multiple theoretical foundations including that of constructivism (McGuire, 2006). Supplemental instruction was designed to look at course content and study strategies from multiple perspectives reinforcing the constructivist epistemology (Schunk, 2008). Congruent with many constructivist principles is Kolb’s experiential learning theory (Kolb & Kolb, 2005). Specifically, Kolb and Kolb (2005) identify six propositions to base experiential learning theory, some of which overlap with identified constructivist epistemology including the idea that students must become actively engaged in their own learning and personal development.

Through the move from a teacher-centered to a learner-centered approach to higher education, a goal of supplemental instruction is to improve student learning outcomes and teach the students the skills of analysis, synthesis, and evaluation (McGuire, 2006). The need for students to gain skills in these areas is confirmed throughout the literature as an important aspect of college completion and overall college success.
As a foundation of constructivist epistemology and experiential learning theory, the learning process is based on integrating new information into previously formed ideas or concepts (Kolb, & Kolb, 2005; McGuire, 2006). General study strategy training has been developed to assist students gain not only basic skills, but also to transfer those skills to different tasks throughout their college experience. Tuckman (2003) found that students who received instruction in basic study strategies earned higher grade point averages than those who did not receive the same instruction. Further, Tuckman, when controlling for demographic variables, found that study strategies learned were able to be transferred to later tasks completed by the student at the college level and led to an overall improvement in the students’ success at the institutional level. Similarly, Jarrett and Harris (2009) found study strategies taught by the supplemental instruction leader within the classroom assisted the students during that semester in terms of course completion. This study did not specifically discuss the long term transferability of study skills and strategies, but does indicate short term transfer of skills to in class assignments such as essay writing (Jarrett & Harris, 2009).

The research and literature supporting the transfer of basic study strategies and skills form one task to another lends credence to an overarching tenet of supplemental instruction. This tenet is that of transferability of skills from one course to another and over the entire collegiate career (University of Missouri-Kansas City, 2006).

One of the major goals of supplemental instruction is not only for the student to learn course content during the study sessions, but to also reinforce basic study strategies needed within the college environment. Additionally, Bowles and Jones (2003) found that self selection bias does not appear to occur within supplemental
instruction. Within their analysis of supplemental instruction, Bowles and Jones found that students with below average academic ability are more likely to attend supplemental instruction sessions. This finding illustrates the need for a supplemental instruction program to include study skills and strategies as a component of the sessions to further assist students in achieving their academic goals.

A similar result was reported by Hensen and Shelley (2003). In their study of the impact of supplemental instruction, they found that students with lower composite ACT scores participated at higher rates than students with higher ACT scores. The authors also noted that supplemental instruction participants still performed better than non-participants even when controlling for ACT scores. This result further implies the effectiveness of supplemental instruction programs on the persistence of students within historically difficult courses.

Additionally, Wright, Redmon Wright, and Lamb (2002) found supplemental instruction to possibly have a positive influence on the performance and retention of students taking a developmental mathematics course with the addition of faculty involvement in promoting the supplemental instruction study sessions. This result supports the concept of integrating the faculty member into the promotion and coordination of the supplemental instruction program (University of Missouri-Kansas City, 2006; Hurley, Jacobs, & Gilbert, 2006). Through increased involvement of faculty within the program coordination and promotion, the supplemental instruction program may see increased buy in from the faculty involved and be provided with more support for the program in current and future semesters from faculty counterparts.
Supplemental instruction targets courses deemed “barrier” or historically difficult (Hurley, Patterson, & Wilcox, 2006; University of Missouri-Kansas City, 2006). More specifically, supplemental instruction targets courses with at least a 30% drop, withdrawal, or fail rate (University of Missouri-Kansas City, 2006). These courses undoubtedly lead to decreased persistence among students enrolled in these courses. Furthermore, many of the targeted courses are required for a student to complete in order to move through the institution toward graduation. Bronstein (2008) found in her single case descriptive study that supplemental instruction appears to lead to course completion and overall persistence of the student within the “barrier” course. This study is more unique within the literature surrounding supplemental instruction in that it did not focus on course completion of a lower level course, but rather focused on an upper level chemistry course. Traditionally, much of the literature and subsequent implementation of a supplemental instruction program focuses on “barrier” courses or historically difficult courses at the freshman and sophomore level of college. Supplemental instruction participants have also been found to re-enroll at higher rates than students who chose not to participate in supplemental instruction sessions (Ogden, Thompson, Russell, & Simons, 2003). This further validates that supplemental instruction participation has an effect on persistence within college and increases the retention of the student at the institution.

Students’ foundational knowledge and effective use of study strategies serves as an indicator of college completion. Procter, Prevatt, Adams, Hurst, and Petscher (2006) found that students who struggled academically demonstrated weaknesses in basic study skills. It can be inferred through this study that students who do not know how to
properly utilize basic study skills and strategies within the classroom environment may not successfully complete the course in question and more importantly may not complete their respective college degree. Further, Jarret and Harris (2009) found in their descriptive analysis of a modified supplemental instruction program that student satisfaction rates increased when study strategies were not only incorporated into the supplemental instruction sessions, but also into a world civilization course. Students also indicated they had increased ability to transfer these skills to other courses.

Motivation was found to be one of the weaknesses identified by students who struggle academically within the college classroom (Procter, Prevat, Adams, Hurst, & Petscher, 2006). Personal motivation appears to be a strong indicator of academic success in college. Dennis, Phinney, and Chuateco (2005) found in their research on ethnic minority first-generation college students that personal motivation to attend college affects the student’s grade point average. Personal motivation of a student can lead him or her to attend or not attend the supplemental instruction session. If a student is motivated he or she may be more willing to attend an out-of-class study sessions facilitated by a peer.

Peer support while attending college can affect grade point average and have an influence in the academic success of the student (Dennis, Phinney, & Chuateco, 2005). Within supplemental instruction programs, student peers are supported by a supplemental instruction leader who assists the student develop academically by facilitating study sessions (McGuire, 2006; University of Missouri-Kansas City, 2006). Peer support is not only important to the student who is attending the supplemental
instruction session, but is also an important developmental component of the supplemental instruction leader (Stout & McDaniel, 2006).

Through the design of the supplemental instruction program, the program is deemed non-remedial in nature (Hensen, & Shelley, 2003). All students enrolled in a course that offers supplemental instruction as an option have the ability to attend sessions throughout the academic year (University of Missouri-Kansas City, 2006). By opening the sessions to all students, this enables struggling students to interact on a regular basis with students who are performing well within the course. The students can interact and discuss relevant course issues with each other as well as with the supplemental instruction leader. Hensen and Shelley (2003) also found within their study that the supplemental instruction participants have lower entry statistics in terms of entrance test scores indicating that the supplemental instruction program assists students who tend to struggle academically thereby discounting the theory that only high achieving students attend supplemental instruction sessions. The self-selection myth has perpetuated not only within the supplemental instruction model, but in other academic support models as well.

Supplemental instruction has also been found to have a positive impact on the participant’s grade point average. Within their study, Hensen and Shelley (2003) found that supplemental instruction participants earned a smaller proportion of lower grades including the grades of D and F. This indication has been confirmed in a research study by Peterfreund, Rath, Xenos, and Bayliss (2008), who found supplemental instruction to have a positive impact on student course completion. Additionally, results of the study by Peterfreund et al. confirm earlier results by Hensen and Shelley (2003) that indicated
students attending supplemental instruction were found to have lower academic indicators. Furthermore, Peterfreund et al (2008) found the effect of attending supplemental instruction sessions was greater for male students enrolled in courses with a supplemental instruction leader and a course with a supplemental instruction component than it was for female students.

Supplemental Instruction Program Design

A key and integral component to the supplemental instruction program is the design and facilitation of study sessions (Hurley, Jacobs, & Gilbert, 2006; University of Missouri-Kansas City, 2006). In addition to attending class with enrolled students, the supplemental instruction leader designs and facilitates a minimum of three out-of-class study sessions per week (Hurley et al., 2006). Specific recommendations are given to the supplemental instruction leader during the training process facilitated by the supplemental instruction coordinator or institution administrator (Hurley, et al., 2006). Further, training is recommended to occur just before the beginning of a new semester as well as the incorporation of an ongoing training and development program throughout the academic term (University of Missouri-Kansas City, 2006). Through having multiple points of contact in terms of training the supplemental instruction leaders, the program coordinator can be more assured of quality control as well as quality improvement within the entire supplemental instruction program.

Planning a supplemental instruction session includes a thoughtful and developed plan. In general, session plans should include specific objectives of the session as well as the processes the supplemental instruction leader plans to use in order to best facilitate the study session (Hurley, Jacobs, & Gilbert, 2006). Further reinforcing the
concepts of constructivism and experiential learning theory, the supplemental instruction session is an ideal setting where the supplemental instruction leader can guide students through different concepts so the student can learn on his or her own (Hurley et al., 2006). Kolb and Kolb (2005) in their propositions of experiential learning theory base learning on self-created knowledge; where a learner acquires knowledge and information and processes the newly acquired knowledge for him or herself. Inclusive of this planning is the need for a supplemental instruction leader to identify multiple modes of content delivery and facilitation while keeping in mind one of the tenets of supplemental instruction which is to include students in most or all of the session process (Hurley et al., 2006).

Scaffolding of information found within supplemental instruction sessions appears in the literature to be based on the theory espoused by Vgotsky (1986). Wood, Bruner, and Ross (1976) introduced this concept on the foundational principles of Vgotsky. Scaffolding information is an integral part of a successful supplemental instruction session. A student bases his or her assumption about the problem at hand from their own knowledge base. They then move through the problem to determine a solution. The supplemental instruction leader does not “answer” the question outright for the student; he or she encourages the student to build upon his or her own knowledge to determine an outcome (Hurley, Jacobs, & Gilbert, 2006).

A key strategy ideally incorporated into every supplemental instruction session is that of redirecting questions (Hurley, Jacobs, & Gilbert, 2006). Through redirecting questions a student may pose to other individuals present at the session, the supplemental instruction leader becomes a facilitator of information as opposed to the
sole authority of knowledge. Ultimately, through redirection the student participants become more comfortable with demonstrating their own personal knowledge with other participants (Hurley et al., 2006). The concept of redirecting questions back to the student participants and allowing the student to learn how to apply foundational principles into new constructs and ways of thinking further reinforces the constructivist epistemology of supplemental instruction (University of Missouri-Kansas City, 2006).

An interesting note on redirecting questions and facilitating sessions in different formats is included in Hurley, Patterson, and Wilcox (2006) where they note how video based supplemental instruction sessions offer a different way of developing session material. Within this format, an instructor records him or herself and the video is utilized within the supplemental instruction session. The facilitator can then slow down course material and allow students to hear the instructor explanation of course material for a second time. This allows time for the students to clarify their questions and re-learn the material from the course from the actual instructor as opposed to having a purely facilitator based study session as is the case in traditional supplemental instruction sessions.

In terms of problem solving strategies utilized during a supplemental instruction session, board work done by the student participants is seen as key to the facilitation process (Hurley, Jacobs, & Gilbert, 2006; University of Missouri-Kansas City, 2006). Utilizing board work not only involves the participants in problem solving, but also encourages the participants to interact with one another and explain their solution to the problem with each other. Ultimately, the supplemental instruction leader needs to design and facilitate his or her study session to mirror how the faculty member chooses
to present the material inside the classroom (Hurley et al., 2006). Through the common presentation of course material the student participants are exposed to the material in largely the same format allowing the student to focus on mastery of the concept as opposed to learning the same information in a new or different way.

Experiential learning theory developed by Kolb (1984) was refined by Kolb and Kolb (2005) to include the interaction of the individual and the environment. The emphasis on the environment and the interaction of the individual within the environment was clarified by Kolb and Kolb (2005) to further the concept that experiential learning theory is more than a set of tools and techniques for learning and goes beyond to explain the process of taking in and acquiring information. Kolb and Kolb (2005), feel that an individual must experience tension between the four steps in the experiential learning process. Kolb and Kolb (2005) further clarify that the cycle of learning can be viewed as a spiral where an individual moves upward through the learning process all the while utilizing his or her strengths or learning style preference to maximize learning potential.

Through the emphasis on the environment, Kolb and Kolb (2005) introduce the “learning space” concept (p. 199). Within this concept, Kolb and Kolb define this space as both physical environment as well as constructed environment. It is argued that an institution of higher education must make room for this space by demonstrating respect for learner experiences within the space; further, an institution has the ability to positively affect student learning through the fostering and creation of both physical and mental spaces for the learner (Kolb & Kolb, 2005). Finally, the “learning space” concept must, according to Kolb and Kolb, be integrated throughout the institution.
All members of the institution must be on board with creating an environment of mutual respect and collaboration (Kolb & Kolb, 2005). Competing interests among administrators, faculty, and staff members may cause the learning environment to become fragmented resulting in an ineffective environment for learning. If all members of the community develop in tandem a core philosophy of experiential learning and the development of an environment conducive to learning, the learner will ultimately benefit by being engaged in a comfortable, safe environment (Kolb & Kolb, 2005). The concept of the “learning space” and institutional buy-in can be adapted to the overarching concept of institutional support for the supplemental instruction program in that support for a successful program is needed from multiple levels of the institutional players.

Supplemental Instruction Leader

The supplemental instruction session is facilitated by a supplemental instruction leader (Hurley, Jacobs, & Gilbert, 2006; University of Missouri-Kansas City, 2006). The supplemental instruction leader is a peer or near-peer individual who is knowledgeable about the subject matter and course content (Hurley et al., 2006). Competence in the course content is determined by the respective supplemental instruction program; however, in general competence is determined by previous course completion and mastery of the same or similar course (Hurley et al., 2006).

Benefits of the supplemental instruction program not only affect enrolled students who attend supplemental instruction sessions, but the role of the supplemental instruction leader serves to benefit him or her in their own personal development. A leadership role within the college environment contributes to increased satisfaction among college students and also assists in their personal development as individuals.
Positive experiences in interpersonal interactions were cited by Logue, Hutchens, and Hector (2005) as a result of leadership experiences. Without such interactions, the study found, the students would feel that their leadership experience was meaningless. Supplemental instruction, by design, assists in developing these actions through its use of out-of-class study sessions facilitated by a peer supplemental instruction leader (University of Missouri-Kansas City, 2006).

Leadership experiences, more specifically the supplemental instruction leader experience, can contribute to the overall academic improvement of the leader within the context of his or her own personal academic growth (Wallace, 1992). The structure of the supplemental instruction program appears to improve student academic success by reinforcing skills and abilities previously developed by the supplemental instruction leader (Blanc & Martin, 1994).

The role of the supplemental instruction leader in organizing and planning the supplemental instruction sessions assist in the further development of transferrable skills the supplemental instruction leader can utilize in future academic and work experiences (Stout & McDaniel, 2006). Through the planning and development of session topics and session structure, the supplemental instruction leader further develops his or her own knowledge base of the course content as well as self confidence (Martin & Wilcox, 1996). As a result, it can be inferred that the supplemental instruction leader is better prepared to facilitate the supplemental instruction session and offer his or her own experiences and knowledge who attend the supplemental instruction session.
As facilitator of supplemental instruction sessions, the supplemental instruction leader serves as a bridge to the faculty member who teaches within the course (Jarrett & Harris, 2009). As Jarrett and Harris indicated, the supplemental instruction leader not only interacts with the students who attend the supplemental instruction sessions, but also interact with and discuss areas of concerns with the professor that the students may be experiencing within the supplemental instruction session. This implication ties directly back to constructivist theory in regards to the concept that the student takes his or her own role in determining the outcome of learning (Wood, Bruner, & Ross, 1976).

The overall impact of the supplemental instruction experience on the supplemental instruction leader has been found to improve the individual development of the student. Lockie and Van Lanen (2008) identified six themes in their qualitative study surrounding the experiences of supplemental instruction leaders. The themes identified included a better understanding of the course content, development of relationships with supplemental instruction course faculty members, the transferability of strategies to subsequent courses, a better understanding of collaborative learning, increased self confidence, and a better appreciation of different learning styles. This study provides evidence that the supplemental instruction program not only affects the student attending the supplemental instruction session, but also impacts the supplemental instruction leader. Overall this leadership experience appears to contribute to personal development of the supplemental instruction leader.

Lockie and Van Lanen’s (2008) identification of a central theme of the developed appreciation of diverse learning needs of individual students exhibits the need for supplemental instruction leaders to develop study sessions based on differing needs of
the students. Within this theme, Lockie and Van Lanen noted that supplemental instruction leaders understood that individual students learn differently and approached study session design with this concept in mind. The supplemental instruction leader developed different ways of approaching a concept within the in study session in order to allow individuals with different learning styles the ability to grasp the concept from their preferred way of learning. In addition to this approach, Lockie and Van Lanen also noted that supplemental instruction leaders learned that different students have different anxiety levels and deal with stress in different ways. By approaching subject matter from different perspectives, the supplemental instruction leader felt that he or she was able to reduce anxiety in students by approaching the students in different ways. The appreciation of different ways of learning by the supplemental instruction leader appears to assist the student in learning during the study sessions by allowing the student to focus on the concept or problem at hand without having to focus on how he or she learns and processes information.

Learning Style and Facilitation

As Lockie and Van Lanen (2008) noted in their qualitative study, the supplemental instruction leader developed an appreciation for different learning styles. However, this study along with many others, does not address how a supplemental instruction leader adapts his or her own learning style into the facilitation of study sessions. No research could be identified in the area of learning style preference of the supplemental instruction leader and how this influences his or her session design. Further, Claxton and Murrell (1987) noted the lack of research surrounding learning style and teaching style. They called for additional research in this and other areas of
learning style research. One reason for the lack of research surrounding learning styles and teaching methods is that the academy focuses on research surrounding specific content areas more thought of as traditional disciplines and not necessarily studying how individuals teach and learn (Claxton & Murrell, 1987).

When expanding the literature search to include facilitation by others, not specifically supplemental instruction leaders, a study by Buch and Bartley (2002) surfaces. This study focused on how learning styles should be taken into account when developing training programs for employees of a financial institution.

Further, Yildirim, Acar, Bull and Sevinc (2008) studied perceived leadership styles in conjunction with learning styles of high school students in Turkey. The authors found that a “mismatch” between teacher and student learning style did not have an effect on student achievement. The common element that led to student achievement was teacher leadership style. If a teacher was more involved with the students the students performed better academically regardless of the field of study. The concept of leadership style and faculty interaction as a predictor of student success within the learning environment has been confirmed in a study by Lundberg and Schreiner (2004). Lundberg and Schreiner found that engagement with faculty members and the building of a relationship between the faculty member and the student can predict learning within the collegiate environment. Their analysis included student race and ethnicity, and found that relationships formed between faculty members and their students were stronger predictors of student learning than student background characteristics. In addition to the development of a satisfying relationship, the study showed that the
frequency of interaction between the faculty member and the student was also a strong predictor of learning among the student regardless of race.

Yildirim, Acar, Bull, and Sevinc (2008) contradict Claxton and Murrell’s (1987) finding that more consideration of student learning styles is necessary in order for institutions of higher education to become more effective in teaching and the dissemination of information to the collegiate population. However, Claxton and Murell argued that although research on matching or mismatching of learning styles on the academic achievement of students has not been definitively answered, it may still be important to consider learning style when approaching course design. In line with Claxton and Murrell, Stice (1987) argues that learning is enhanced when multiple learning styles are utilized in the teaching process. By using multiple learning styles, Stice argues more students will have the opportunity to become engaged in the learning process and will have more retention of information with the more learning styles utilized to explain or introduce a new concept to the student. This concept is echoed by McCarthy (1981) who encouraged the use of multiple learning style modalities in the development of curriculum by instructors.

Grasha (1984) questioned the importance of studying learning styles when approaching how to design collegiate experiences. This argument, along with that by other individuals, adds to the discussion surrounding learning style matching and mismatching, but does not contribute to the scholarly literature in terms of empirical research developed and conducted. What remains today is the same amount of conjecture with a lack of research data to base decisions for the collegiate environment. For example, Claxton and Murrell (1987) noted that a mismatch of learning style among
the instructor and student may encourage the student to move toward developing a new way of learning and looking at an important issue or concept. They argue the mismatch of learning styles will cause the student to have to look beyond his or her comfort zone to develop in different ways. Nevertheless, this, like other theoretical discussions surrounding learning styles and their effective or ineffective use within curriculum development is theoretical in nature.

Much like the lack of research surrounding learning styles and teaching style or facilitation style, lack of consensus among the academic community also exists in defining a learning style (Hendricson, Berlocher, & Herbert, 1987). This appears, according to Hendricson, Berlocher, and Herbert, to be a consequence of individuals from different disciplines and fields of study looking into learning styles and taking different stances on what specifically a learning style is and is not. Nevertheless, it appears to be important to understand basic learning style concepts when teaching or explaining material to college level students in order to remain sensitive to different approaches to learning (Claxton & Murrell, 1987).

Learning Styles

Based on his theory of experiential learning, Kolb (1981) described four different learning styles of students. These styles as well as the theory are grounded in past works by Dewey, Lewin, and Piaget (Claxton & Murrell, 1987). The experiential learning theory developed by Kolb (1981) argues that a student learns and develops cognitively when learning is based on practical experiences that the student moves through in a cyclical nature. The student moves through four stages of development when learning new information. It is necessary, according to Kolb, that a student develop the four
different abilities in order to be an effective learner. The four dimensions described by Kolb (1981) are: concrete experience, reflective observation, abstract conceptualization, and active experimentation. Thought of in terms of a process, the student moves from a lower level through the four processes and ultimately ends back where he or she began, but at a higher level of thought and knowing (Claxton & Murrell, 1987).

Where a student begins within the cycle depends on where the student prefers to begin. Claxton and Murrell (1987) noted that some students prefer to think in terms of concrete experiences while others prefer the abstract. Due to this difference, a student may begin the learning process in either step, but ultimately draws experiences from all four steps in order to complete the learning process and move onward and upward toward more complex thinking and reasoning ability.

Ultimately, the four steps within experiential learning theory, learning styles, and the movement of an individual through the learning process was integrated together to form a visual representation of a “cone” shape (Claxton & Murrell, 1987; Kolb, 1981). This shape allows the individual to move in the circular motion through the learning process while thinking in more complex terms throughout his or her life.

Based on the four step process of the experiential learning theory, Kolb (1981) developed different learning styles associated with each of the steps or processes a learner must go through in order to develop sound understanding of a concept. According to Kolb’s (1981) theory the four learning styles are: converger, diverger, assimilator, and accommodator. Each of the learning styles is based in two different strengths and preferences of the experiential learning process.
Converger’s focus on practical application of concepts and find the abstract conceptualization and active experimentation as strengths. These individuals tend to focus on the sciences where a single correct answer can be sought and found (Kolb, 1981). Further, Kolb found that the majority of converger’s major in engineering and nursing.

Diverger’s, according to Kolb (1981); demonstrate the opposite characteristics of convergers. A diverger’s strength lies in the realms of concrete experience and reflective observation. They tend to be individuals who view situations from multiple perspectives and do well in thinking in the abstract. Further, Kolb noted that these individuals tend to be interested in people and tend to be emotional when dealing with learning situations. In his study, Kolb found the majority of diverger’s major in fields such as English, psychology, history, and political science.

The third learning style according to Kolb (1981) is the assimilator. These individuals demonstrate strengths in the steps of abstract conceptualization and reflective observation. These individuals mirror some aspects of the converger in that they are less interested in people, but differ in that they enjoy dealing with the theoretical. It is important, according to Kolb, for these individuals to have sound theoretical basis for their actions. He found that the majority of these individuals major in the fields of mathematics, economics, chemistry, and sociology.

The final and fourth learning style according to Kolb’s experiential learning theory (1981) is that of accommodator. According to Kolb, this is the opposite learning style of the assimilator. Their strength lies in the steps of concrete experimentation and active experimentation. They enjoy doing things. These individuals experiment and tend to be
risk takers (Kolb, 1981). They tend to, according to Kolb, be action oriented people who major in fields such as: business and marketing.

Experiential learning theory argues that an individual’s learning style is dynamic in nature and can change depending of environmental factors (Kolb, 1984; Kolb & Kolb, 2005). In practice, Kolb and Kolb (2005) feel people tend to view learning styles as fixed. Due to this phenomenon, the authors of the Learning Style Inventory have changed the labels of the learning styles from describing an individual to describing a characteristic of the individual at that space and time.

Salter, Evans, and Forney (2006) researched the stability of learning styles based on the Kolb Learning Style Inventory as well as the Myers-Briggs Type Indicator over time. In their research, the authors found styles based on the Kolb Learning Style Inventory were more varied over time than the styles indicated by the Myers-Briggs Type Indicator. The converger learning style was the least stable of the four learning styles (Salter, Evans, & Forney, 2006). An issue with this study is that it focused on graduate students who may be more developed in their learning patterns as well as personal development. Similar to the recommendation of the authors of the study, a different result may be experienced if undergraduate students were studied. They tend to be younger in age and experience and may be searching for the “best” way to approach a learning situation.

Theoretical Frame

After reviewing constructivist epistemology and Kolb’s experiential learning theory, I have selected Kolb’s experiential learning theory as a frame for this study because Kolb takes into consideration many of the tenets of constructivist epistemology
and relates his theory to that of learning styles. Kolb’s (1984) learning styles form a practical application of experiential learning theory that will allow me to study how learning styles impact the design of supplemental instruction session design.

Further, Kolb and Kolb (2005) identified learning as the process of creating knowledge on ones’ own as opposed to the current “transmission” model currently in practice. This concept is congruent with major tenets of supplemental instruction in that learners must take ownership of their own learning (McGuire, 2006). Kolb's theory can provide a comprehensive framework from which to look at the process of study session design from multiple perspectives. This theory provides the most comprehensive theory to frame the study due to the foundational principles that compliment supplemental instruction, while also having specific propositions from which to study the phenomenon.
CHAPTER 3
RESEARCH METHOD

Consistent with qualitative research tradition, this study was a basic, interpretive qualitative study and focused on whether the learning style of a supplemental instruction leader influences the development and design of out-of-class study sessions (Merriam, 2002). The supplemental instruction program at the University of North Texas, more specifically, experiences of University of North Texas supplemental instruction leaders were used as a basis for this study. Individual participants completed the Kolb Learning Styles Inventory (2007). Further, participants were interviewed followed by document analysis of session planning documents. Finally, all data were triangulated with an additional peer review of data analysis for internal reliability and validity (Creswell, 2009; Merriam, 2002).

Population

For this study, the population was 37 supplemental instruction leaders currently employed by the Learning Center at the University of North Texas as of the fall 2010 semester. The Learning Center is an academic support office within the Division of Undergraduate Studies that provides multiple modalities of tutoring and academic support for students of the institution. The supplemental instruction program follows the model described by the International Center for Supplemental Instruction at the University of Missouri at Kansas City (2006).

Sample

Participants for the study were purposefully sampled from the population (Merriam, 2002; Creswell, 2009). Participation was sought from supplemental
instruction leaders when the study was introduced to the population at an ongoing training session held during the week of October 18, 2010. Participants were verbally invited to take part in the study and given a recruitment flier outlining basic information surrounding the study and requesting participation from the individual. A total of 24 individuals expressed interest in participating in the study. Of the 24 individuals, 20 completed all parts of the study. The recruitment flier is included as Appendix C.

All supplemental instruction leaders who have served in their position for a minimum of one semester were eligible to participate in the study. This criterion was necessary in order to complete the study so the supplemental instruction leader will have had the opportunity to design and conduct out-of-class study sessions in the past. Both male and female participation was sought for inclusion into the study. Further, the sample included 20 supplemental instruction leaders from multiple disciplines in order to better understand if individuals working within different academic disciplines approach session design in different ways. Likewise, the sample included multiple individuals from the different academic disciplines in order to better create a picture of supplemental instruction leader experiences with session planning and design. Participation within this study followed institutional procedures of soliciting informed consent.

Instrumentation

Instrumentation utilized within this study to triangulate data were: the Kolb Learning Style Inventory (2007), individual semi-structured interviews, and document analysis of out-of-class study session planning documents. Triangulation of data
sources was used to improve internal validity and reliability of the study (Merriam, 2002; Patton, 1990).

Based on Kolb’s experiential learning theory (Kolb & Kolb, 2005), the Kolb Learning Style Inventory (2007) is a 12 question pen and paper inventory. The participant responds to questions posed within the inventory designed to explore how he or she prefers to learn. The output of the inventory is scored and recorded on a grid provided with the instrument. Information on the inventory and scoring procedures are included in an accompanying workbook (Kolb, 2007).

As noted before, experiential learning theory is consistent with the constructivist epistemology that was used as one of the foundations of supplemental instruction (McGuire, 2006). Learning is not only a process for the study session participant, but also for the supplemental instruction leader (Hurley, Jacobs, & Gilbert, 2006). Therefore, information sought during the interview process included questions developed to encourage supplemental instruction leaders to reflect on his or her own learning and development. For example, the central job responsibility of supplemental instruction leader is to design out-of-class study sessions (Hurley, Jacobs, & Gilbert, 2006). Due to this, the majority of questions surrounded how the study session is designed and how the individual begins to create study sessions.

Additionally, experiential learning theory dictates that in order for learning to occur tension must occur between the four learning modes and requires a learner to experience, reflect, think, and act (Kolb & Kolb, 2005). Since the supplemental instruction leader is viewed as a learner him or herself, an additional goal of the interview process was to have the supplemental instruction leader develop holistic out-
of-class study sessions (Hurley, Jacobs & Gilbert, 2006). Due to this tenet of supplemental instruction, I asked questions surrounding the length of time in developing study sessions as well as what elements are included in each study session.

Further, research by Kolb (1984), and refined by Kolb and Kolb (2005), demonstrates that an individual learning style may be influenced by personality type and choice of major. Many of the questions asked during the interview process were designed to exhibit whether supplemental instruction leaders from different academic disciplines and learning styles develop their respective study sessions in different ways. For example, one question asked during the interview process was how a supplemental instruction leader responds to student questions. The goal of this question was to be able to better determine if supplemental instruction leaders with different learning styles and majors respond differently to student questions during out-of-class study sessions.

Finally, consistent with experiential learning theory is the concept of self reflection (Kolb & Kolb, 2005). Supplemental instruction leaders participating in this study were asked what aspects of session design they are proud of and which they would like to improve. The goal of these questions was to not only allow for further reflection on study session design, but to illicit responses that may be compared across the different learning styles and academic disciplines of the supplemental instruction leaders.

The final instrumentation used to collect data was document analysis of session planning notes completed by the individual supplemental instruction leader. As a requirement of their employment, each supplemental instruction leader completes session planning documents before each out-of-class study session. This document
serves as the starting point for the supplemental instruction leader when developing study sessions. Minimally, each document includes the concepts the leader wants to cover during the session and activities the leader will encourage participation in during the study session.

Data Collection

Collection of the data for this study was based around a three-step process to allow for triangulation of the data (Patton, 1990). Participants first completed the Kolb Learning Style Inventory (2007). Second, participants sat for a semi-structured interview and completed a demographic questionnaire. The third step was document analysis of participant’s session planning notes. The three step process is consistent with basic, interpretive qualitative studies as noted by Merriam (2002).

Prior to beginning the interview process all participants were given participant numbers to better insure anonymity among participants. The participant key relating individual names and their respective participant number are kept in a locked office cabinet.

The Kolb Learning Style Inventory (2007) is an inventory that measures the four phases of learning outlined by Kolb (1984). Participants took the inventory prior to being interviewed. I scored the inventory and did not share results from the inventory with the participant until after the formal interview was completed. The intention of not disclosing results of the inventory until after the interview was to limit interview answer bias of the participants. In addition, results of the inventory were not reviewed in connection with the interview process. In other words, interview questions were not influenced by inventory results that indicated a particular learning style.
The second component to data collection was conducting semi-structured, individual interviews with participants. All interviews were conducted on the same day as the completion of the inventory. The location of the interviews was a small conference room within the Learning Center at the University of North Texas. All interviews were recorded and transcribed. In order to allow for flexibility within the individual interviews a semi-structured format was adopted (Merriam, 2002). At the beginning of each interview the participant answered a short pen and paper questionnaire on demographic information. The pen and paper questionnaire is included as Appendix A. Demographic information on participants was sought to increase the richness of the data collected and provide a more detailed description of participant’s answers to interview questions and results from the Kolb Learning Styles Inventory (2007).

Once the questionnaire was completed, the participant was invited to continue with a face to face, recorded, individual interview. The semi-structured interview was chosen to allow for flexibility during the interview process (Merriam, 2002). The interview script is included as Appendix B.

All questions for the interview were asked in a sequential order allowing for discussion between myself and the participant to flesh out specific responses as well as to further develop the results of this study. Kolb’s experiential learning theory was utilized as a basis for developing questions (Kolb & Kolb, 2005). Consistent with the six propositions developed by Kolb, learning is thought to be a process by which learners create new knowledge based on previously held beliefs. Reflection on learning is viewed as important to the overall process of learning and acquiring knowledge (Kolb &
Kolb, 2005). As an example of how the interview questions were based on experiential learning theory, within the interview, participants were asked to reflect upon his or her approach to out-of-class study session design. Additionally, participants were asked where he or she felt they learned of this process. These two questions, in particular, highlight the need for an individual, as described by Kolb and Kolb, to reflect upon his or her experiences in order to fully engage with personal knowledge.

Kolb and Kolb (2005) also explore within experiential learning theory the concept that interaction with the environment is important for knowledge creation. Interview questions developed on this concept such as: describe a study session you have facilitated and what occurred, and how do you respond to student questions regarding course content helped the participant explore how he or she handles specific situations.

As a final example of the integration of experiential learning theory (Kolb & Kolb, 2005) into interview question development, participants were asked about the areas of their study sessions of which the participant is particularly proud and would like to improve. The intention behind these questions was to uncover how the participant feels and perceives his or her role as a supplemental instruction leader. This directly corresponds with experiential learning theory in that it is important for the learner to fully integrate him or herself within the situation in order to construct new knowledge.

The final process of data collection was document analysis of session planning documents completed by the supplemental instruction leader. Contents of the session planning document were reviewed and triangulated with interview transcriptions and results of the Kolb Learning Style Inventory (2007) for clarity and consistency in participant response (Merriam, 2002; Patton, 1990).
Data Analysis

With a goal of understanding the relationship between learning styles of supplemental instruction leaders, as determined by the Kolb Learning Style Inventory (2007), and their approach to study session design, analysis of the data began as soon as data were collected. This process is consistent with qualitative research design whereby a researcher begins “data analysis simultaneous with data collection” (Merriam, 2002, p. 14). All interviews were transcribed and coded for common ideas and similar thoughts presented by the participants and compared those data with results from the Kolb Learning Style Inventory (2007) and the session planning documents allowing the emergent nature of the data to determine the general and specific themes found within the data (Merriam, 2002). In order to visually represent the data, the study session designs and interview data were plotted on a scatter graph showing how the study session designs and the interview data related to the participants' learning styles.

Upon completion of coding, the data was analyzed for further themes and reported in a descriptive form the results of the analysis. Consistent with qualitative research tradition, triangulation of multiple data sources allowed for the development of themes based on repetition within the data and consistent responses from the participants (Merriam, 2002; Patton 1990). All coding, themes, and analysis of the data were framed within Kolb’s theory of experiential learning (2005) which served as the guide for the collection and analysis of the data (Creswell, 2009).
CHAPTER 4

RESULTS

Participant Flow

Individual sessions with participants were set up beginning October 24, 2010 and concluding November 5, 2010. Each individual who expressed initial interest in participating in the study during the recruitment efforts was invited to begin and continue participation with the study. A total of 20 supplemental instruction leaders chose to participate in the entire study process out of the 24 supplemental instruction leaders who initially expressed interest in participation. The total population of supplemental instruction leaders during the fall 2010 semester was 37.

All individual sessions were held in a private office within the Learning Center at the University of North Texas. When the participant arrived, he or she was welcomed and thanked the participant for agreeing to participate in the study. The informed consent form was then reviewed with the participant and the participant read and signed the document. No participants expressed concern or had a question regarding participation once the informed consent was completed. The informed consent form is included as Appendix D.

Participants were then assigned a coded participant number that has subsequently been substituted with a pseudonym. Coded participant numbers were converted to pseudonyms for ease and clarity of reporting participant results. Pseudonyms were assigned based on gender and corresponding participant number. For example, Participant 1 who is a female has a pseudonym of Amy. A list of assigned pseudonyms is included in Table 1.
Once the informed consent was completed, I explained how to complete the Kolb Learning Style Inventory (2007). Additionally, answers to common questions on how to complete the inventory with the participant were shared. A copy of the informed consent was made to give to the participant while the participant completed the inventory.

Upon completion of the inventory, the participant was given a blank copy of the pen and paper demographic questionnaire. The pen and paper questionnaire is included as Appendix A. The Kolb Learning Style Inventory (2007) was scored while the participant completed the demographic questionnaire. The inventory was scored and the result of the inventory was not shared with the participant at the time of completion. The result of the inventory was given at the end of the participation within the study.

After the completion of the demographic questionnaire and the scoring of the inventory, the participant was invited to sit for an individual, recorded, semi-structured interview. All 20 participants agreed to continue with the process and sit for the interview. During the interview, questions were asked based on a semi-structured format allowing for more freedom and inquiry into participant thoughts and understandings of study session planning and design. Notes were taken during the interview to further document the interview in addition to the audio recording.

At the conclusion of the interview, the results from the Kolb Learning Style Inventory (2007) were shared with the participant. Additionally, the definition of the result was verbally explained to the participant as was a brief discussion on the
meaning of the learning style result. Once complete, the participant was thanked for his or her participation and the individual session was complete.

Demographic Data

The participants in this study were currently employed supplemental instruction leaders who have served within the role of supplemental instruction leader for a minimum of one previous semester prior to the fall 2010 semester. A total of 20 individuals chose to participate in the study by completing a demographic questionnaire, Kolb Learning Style Inventory (2007) and a recorded interview. Table 1 outlines demographic data of participants based on the pen and paper demographic questionnaire.

The age of participants ranged from 20 years old to 31 years old with an average participant age of 22.25 years old. Nine participants reported their gender as male, while 11 participants reported their gender as female. Of the 20 participants, one participant indicated a race or ethnicity of Asian, two participants indicated African American, 16 participants indicated white, and one participant indicated both American Indian or Alaska native and white. No participant reported a race or ethnicity of native Hawaiian or other Pacific islander. Further, two participants indicated they are of Hispanic, Latino, or Spanish origin while the remaining 18 indicated they are not of this origin. A total of 17 participants indicated their marital status as single, and three participants indicated they were married.

Senior was the most commonly reported classification among participants with 17 indicating senior as their classification. Two participants indicated junior as their
classification with one indicating sophomore. No participants reported being a freshman or graduate student.

Table 1

**Participant Data**

<table>
<thead>
<tr>
<th>Assigned Name</th>
<th>Age</th>
<th>Gender</th>
<th>Race/Ethnicity</th>
<th>Marital Status</th>
<th>Classification</th>
<th>Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amy</td>
<td>31</td>
<td>Female</td>
<td>White</td>
<td>Married</td>
<td>Senior</td>
<td>Biology</td>
</tr>
<tr>
<td>Bill</td>
<td>22</td>
<td>Male</td>
<td>White</td>
<td>Single</td>
<td>Senior</td>
<td>English</td>
</tr>
<tr>
<td>Carla</td>
<td>22</td>
<td>Female</td>
<td>African American</td>
<td>Single</td>
<td>Senior</td>
<td>Communication Studies</td>
</tr>
<tr>
<td>Donna</td>
<td>21</td>
<td>Female</td>
<td>White</td>
<td>Single</td>
<td>Senior</td>
<td>Drawing and Painting</td>
</tr>
<tr>
<td>Everett</td>
<td>22</td>
<td>Male</td>
<td>White</td>
<td>Single</td>
<td>Senior</td>
<td>BCIS*</td>
</tr>
<tr>
<td>Fran</td>
<td>21</td>
<td>Female</td>
<td>White</td>
<td>Single</td>
<td>Senior</td>
<td>Fashion Merchandising</td>
</tr>
<tr>
<td>Gavin</td>
<td>22</td>
<td>Male</td>
<td>White</td>
<td>Single</td>
<td>Senior</td>
<td>Radio, TV, Film</td>
</tr>
<tr>
<td>Helen</td>
<td>21</td>
<td>Female</td>
<td>White</td>
<td>Single</td>
<td>Senior</td>
<td>Biology</td>
</tr>
<tr>
<td>Ivy</td>
<td>20</td>
<td>Female</td>
<td>White</td>
<td>Single</td>
<td>Junior</td>
<td>Music Composition</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>International Studies</td>
</tr>
<tr>
<td>Jay</td>
<td>23</td>
<td>Male</td>
<td>African American</td>
<td>Single</td>
<td>Senior</td>
<td>Sociology</td>
</tr>
<tr>
<td>Kerry</td>
<td>22</td>
<td>Female</td>
<td>White</td>
<td>Single</td>
<td>Senior</td>
<td>Accounting</td>
</tr>
<tr>
<td>Lily</td>
<td>20</td>
<td>Female</td>
<td>Asian</td>
<td>Single</td>
<td>Sophomore</td>
<td>Geography</td>
</tr>
<tr>
<td>Mary</td>
<td>22</td>
<td>Female</td>
<td>White</td>
<td>Single</td>
<td>Senior</td>
<td>History</td>
</tr>
<tr>
<td>Nancy</td>
<td>21</td>
<td>Female</td>
<td>White</td>
<td>Single</td>
<td>Senior</td>
<td>Music</td>
</tr>
<tr>
<td>Oliver</td>
<td>21</td>
<td>Male</td>
<td>White</td>
<td>Married</td>
<td>Senior</td>
<td>Political Science</td>
</tr>
<tr>
<td>Paul</td>
<td>26</td>
<td>Male</td>
<td>White</td>
<td>Single</td>
<td>Senior</td>
<td>History and Political Science</td>
</tr>
<tr>
<td>Quinn</td>
<td>20</td>
<td>Male</td>
<td>White</td>
<td>Single</td>
<td>Junior</td>
<td>History and Political Science</td>
</tr>
<tr>
<td>Rachel</td>
<td>21</td>
<td>Female</td>
<td>White</td>
<td>Single</td>
<td>Senior</td>
<td>History and French</td>
</tr>
<tr>
<td>Steve</td>
<td>26</td>
<td>Male</td>
<td>White</td>
<td>Married</td>
<td>Senior</td>
<td>Electrical Engineering</td>
</tr>
<tr>
<td>Tom</td>
<td>21</td>
<td>Male</td>
<td>White</td>
<td>Single</td>
<td>Senior</td>
<td>Chemistry</td>
</tr>
</tbody>
</table>

*Note: *Business Computer Information Systems and Converged Broadcast Media

The participants reported a wide range of majors on their demographic questionnaire. Additionally, as shown in Table 2, the participants indicated a range of
subjects for which they provide supplemental instruction. Eleven participants reported math as the subject they provide support for, while five reported political science, two reported history, one reported biology and one reported music theory.

Table 2

Reported Supplemental Instruction Subject

<table>
<thead>
<tr>
<th>Assigned Name</th>
<th>Supplemental Instruction Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amy</td>
<td>Biology</td>
</tr>
<tr>
<td>Bill</td>
<td>Math</td>
</tr>
<tr>
<td>Carla</td>
<td>Political Science</td>
</tr>
<tr>
<td>Donna</td>
<td>Math</td>
</tr>
<tr>
<td>Everett</td>
<td>Math</td>
</tr>
<tr>
<td>Fran</td>
<td>History</td>
</tr>
<tr>
<td>Gavin</td>
<td>Math</td>
</tr>
<tr>
<td>Helen</td>
<td>Math</td>
</tr>
<tr>
<td>Ivy</td>
<td>Music Theory</td>
</tr>
<tr>
<td>Jay</td>
<td>Math</td>
</tr>
<tr>
<td>Kerry</td>
<td>Math</td>
</tr>
<tr>
<td>Lily</td>
<td>Math</td>
</tr>
<tr>
<td>Mary</td>
<td>Political Science</td>
</tr>
<tr>
<td>Nancy</td>
<td>History</td>
</tr>
<tr>
<td>Oliver</td>
<td>Math</td>
</tr>
<tr>
<td>Paul</td>
<td>Political Science</td>
</tr>
<tr>
<td>Quinn</td>
<td>Political Science</td>
</tr>
<tr>
<td>Rachel</td>
<td>Political Science</td>
</tr>
<tr>
<td>Steve</td>
<td>Math</td>
</tr>
<tr>
<td>Tom</td>
<td>Math</td>
</tr>
</tbody>
</table>

Learning Style Inventory

As shown in Table 3, all four learning styles included within the Kolb Learning Style Inventory (2007) were present within the study. Based on the results of the Kolb Learning Style Inventory (2007) and learning style categories developed by Kolb (1981), 10 participants were found to have an assimilating style, 5 had a converging learning style, 3 had a diverging learning style, and 2 had an accommodating learning style.
Emergent Themes from Individual Interviews

Four themes emerged from the individual interview portion of the study based on Kolb’s experiential learning theory (1981) and the results of the Kolb Learning Style Inventory (2007). They are: 1) an incorporation of personal experience into study session design, 2) the sense of impact on student learning, 3) a feeling of the need to incorporate varied activities into study session design, and 4) the concept that students must take ownership over their own learning.
Personal Experience and Study Session Design

During the individual interviews, 17 participants reported drawing on personal experience and personal history to assist in the planning of study sessions. Additionally, participants reported incorporating personal learning processes into how he or she designs his or her study sessions.

Examples of the incorporation of personal experience within study session design include personal processes of organization. Everett, a 22 year-old white male with an accommodating learning style, explained how he always completes “to do” lists that move into functional outlines breaking overarching concepts into smaller, more manageable pieces. Everett utilizes this approach, as do other supplemental instruction leaders, in session planning and design. Everett approaches study session design with a systematic mindset. Multiple participants noted within their interviews that they do what seems “natural” to them in terms of their own personal learning experiences.

Kerry, a 22 year-old white female with a converging learning style, organizes her personal notes and uses these notes as the foundation of her session design.

Six supplemental instruction leaders mentioned another functional way supplemental instruction leaders incorporated personal experience into study session design was by relating to the personal struggles of the student and incorporating this frustration within the study session activities.

A different way of explaining this process is when a supplemental instruction leader is considering how to approach a certain concept within his or her session; he or she will step in to the students’ point of view and look at a problem through their eyes, then the supplemental instruction leader will pull from personal experience to develop a
study session. Bill, a 22 year-old white male with an assimilating learning style, discussed how he relates to his students frustration by stating:

I think as an English major I’m able to relate the frustration of why does the math work this way. How I think of it is similar to the way that some of these students who haven’t had math in 15 to 20 years; and I can be like I’m with you, but this why and how I think of it and it might help you too.

Oliver, a 21 year-old white male with an assimilating learning style, stated that he tries to change his perspective to begin “looking at it from a student studying standpoint as opposed to an SI standpoint.” Oliver goes on to state that he uses this technique in order to draw upon how he would feel as a student if he were taking the class and had a problem or issue with a small concept.

Personal history and historical experience were also indicated as a method for designing study sessions. Helen, a 21 year-old white female with a converging learning style, spoke about learning how to teach others from her mother who is a teacher and taught Helen how to study. Carla, a 22 year-old African American female with a converging learning style, also cited her mother as an influence in how she approaches not only studying, but teaching:

My mother home schooled my sisters and I for my entire life and so a lot of one on one instruction I got. That’s what I’m used to. I never have a lot of students until review sessions, so generally it’s like five and under and so that’s more personal to me and I’m used to receiving that so I’m better at getting that out since I saw it so much.
Quinn, a 20 year-old white male with a diverging learning style, believes experience from secondary school science courses taught him how to approach designing study sessions. Paul, a 26 year-old white male with an assimilating learning style, believes his approach to designing study sessions is “probably how I would have taught myself.”

Relating personal experience surrounding current events to students within the design of study session also appears within social science courses such as political science and history. Quinn incorporates current political matters within his sessions. He relates present political matters, personal thoughts of the matters and student interest, or perceived interest, into the session. Within his session, Paul asked probing questions on topics he finds interesting within current media such as political interviews, political commercials and political commentary.

Desired Impact on Student Learning

A second theme that emerged from the individual interviews with participants was how the supplemental instruction leader views their value and worth in terms of impact on the participating student within the study session. Like the previous theme of personal experience influencing study session design, the overarching theme of impact on students is hinged upon smaller elements that build to the overarching theme.

Most participants reported feeling a sense of satisfaction when they know a student learned a new concept or understood a difficult problem. For example, Mary, a 22 year-old white female with a diverging learning style, noted what makes her most proud within a study session:
You can kind of see those light bulb moments where it just makes sense. I think they come out knowing a lot more information and feeling a lot more confident which helps me because then in the next session I know that they’ve gotten it previously.

Tom, a 21 year-old white male with an assimilating learning style, stated that “it always makes me happy when they’ll come up and they’ll tell me that a concept just clicked with them or they did really well on a test.” Steve, a 26 year-old white male, mirrored Tom’s sentiment by stating that he is proud when he can see it “just click when they do get it.” Tom and Steve’s comments were repeated over and over throughout the majority of interviews.

Having an influential and positive effect on student test grades also plays a role within a supplemental instruction leader’s process of designing his or her session. Albeit indirectly, multiple participants included within their interview responses the notion of satisfaction when their planning and session design helped a student achieve a satisfactory test grade. Steve commented that he feels proud when a student translates what they learned within his session into a good test grade. Helen went beyond commenting on random students to include all of her “regular” students, students who attend study sessions often, to say that she is particularly proud when a lot of her students receive an A or B on their exam.

Other participants reported a sense of satisfaction when they build student confidence in the subject matter. Carla stated that she is most concerned with the student’s ability to grasp the material and ultimately her ability to build confidence within the student. This comment was echoed by Nancy, a 21 year-old white female with an
assimilating learning style. Nancy noted that most of her students leave the study session feeling more confident. Nancy, when speaking about how her study sessions go, stated:

I think in general they go really well and students always leave more confident, I don’t feel like I’m ever giving students the information they, I feel like I’m giving them confidence, I’m giving them the chance to see that they did know this all along. I think some of them are surprised when they get there that I’m not lecturing, but they know it, they just don’t know that they know it.

Mary phrased this idea in a slightly different way by stating, “I think they come out knowing a lot more information and feeling a lot more confident, which helps me, because then in the next session I know that they’ve gotten it previously.” Mary makes the connection between what happened in one session and how it builds upon the design of the subsequent sessions.

Within the theme of having impact on student learning is the creation of a comfortable, welcoming environment. Mary noted how she believes that through the creation of a comfortable learning environment students learn better. Part of the creation is, according to Mary, getting to know the names of the students who attend the study sessions. Ivy, a 20 year-old white female with an assimilating learning style, is most proud of the way she creates a comfortable working environment for the students who attend her study sessions. She feels this is presented by the fact that students talk with her outside of class and outside of the study sessions and generally just being “friendly” with her. She feels like students trust her and can come ask her about not only her supplemental instruction course content, but also the content of other courses.
Rachel feels like her personality enables a comfortable learning environment for her students. She reported that she is an outgoing individual who connects easily with people and feels that this translates into students feeling comfortable in the environment of study sessions.

**Incorporation of New and Different Session Elements**

The third theme to emerge from the individual interviews was the recognition by participants of the need to incorporate different elements and activities into study session design. This was coupled with the fact that while they believe this to be true, participants still do not often include new and different elements within session activities.

Amy, a 31 year-old white female with a converging learning style, feels that she could improve group work activities within her study session, but does not due to what she terms “pitting the students against each other.” Further, Amy feels that her supplemental instruction course, biology, is more of a “solo science” and doesn’t lend itself naturally to group work. Amy relies heavily on whole class work in that she leads every attendee as a large group. This sentiment was also reported by Kerry. Kerry feels that she is not really a “creative” person and she prefers to keep the study session in a large group as opposed to small group activities. Fran, a 21 year-old female with an accommodating learning style, feels that she gets stuck with the “hands on” approach to her course, history, and feels she cannot change how the material is presented.
Ivy, a 20 year-old white female with an assimilating learning style, spoke in more general terms about incorporating “activities” into her study session and the need to have students play games in the study sessions:

I would like to be able to come up with a little more variety. There are certain units where I have a game or activity where I can get students up and involved because of how it works, but a lot of time I just feel like it’s the exact same thing over and over, which isn’t necessarily a bad thing, it’s just that I know sometimes I don’t hit those other learning styles that are active and engaged.

The idea of the need of the incorporation of games as activities to add variety to session was echoed by multiple participants including Steve who approaches design of study sessions in a more “laid back” approach that he feels doesn’t lend itself to naturally creating activities for students. Nancy feels her “controlling personality” does not lend itself to the introduction of small group work or other activities. Nancy stated, “I could always stand to do more group work, but because I am a controlling personality, I prefer to be able to watch everybody.”

Oliver reported a slightly different reason for the lack of incorporation of activities within his sessions. Oliver feels that training did not provide him enough tools, he stated:

I don’t feel like I’m well versed enough, I know there’s all sorts of activities that they teach us to incorporate, but I still don’t feel like I have enough grasp of how to incorporate the activities. It’s not like necessarily knowing what activities I can use, it’s just I don’t know how to incorporate them. I don’t know, sometimes it’s
easier with some activities, so I just avoid using specific activities all together because I don’t know what to do with it.

Students are Responsible for Their Own Learning

A fourth and final theme to emerge from the individual interviews is that participants felt the students must take responsibility for their own learning and their role is to guide the student as opposed to transmitting information. Gavin, a 22 year-old white male with an assimilating learning style, feels that it is “really important for them to help themselves.” Fran designs and conducts her sessions so that students can find the answers on their own. When students are working in small groups she will “either sit in with them or just listen to what their saying.” Mary takes a slightly different approach to students learning on their own. Mary has the students who attend her study sessions explain what they know verbally to each other and she facilitates the discussion by letting the students come up with their own explanation for political events. Helen utilizes this approach as well, but believes it is more about the students teaching each other as opposed to her lecturing or leading the discussion. Everett explains this process in the following way:

I tend to favor the parts of my sessions where students pick their problems and go to the board and work them out. I'm pretty sure most of the SI’s do that, but I'm especially good at redirection. I will not answer a question in my session, I try not to.

Multiple participants reported the incorporation of incomplete or blank matrices into their session planning in order to facilitate individual learning by the student. Nancy first determines whether the information to be covered is appropriate for a matrix and if
so, creates a blank table for the student to complete on his or her own. She has the
students develop their own definitions and then report them back to the whole group in
their own words.
CHAPTER 5
DISCUSSION

Participant Characteristics

A total of 20 supplemental instruction leaders meeting the criteria of the study chose to participate fully with this study. Both male and female individuals participated as expected with the design of the study. The range of ages of the participants, from 20 years old to 31 years old, appears to be representative of returning supplemental instruction leaders working within the Learning Center at the University of North Texas.

More participants reported white as their race than other races or ethnicities. While this may be proportional to the population, the study may have been improved by having more individuals from other race or ethnic categories. When considered as a whole, all responses appear to be consistent throughout the study regardless of race or ethnicity.

Additionally, the sample contained individuals with widely varied college majors. The majors of the participants, illustrated in Table 1, ranged from social sciences to hard sciences as well as including the liberal arts and creative arts. This, however, does not appear to be a consideration in responses by the participants.

A total of five different supplemental instruction subjects were represented by the participants. The subjects were: math, political science, biology, history, and music theory. The study may have been improved by having additional participants from different subjects represented. The representation does reflect, to some extent, the distribution of supplemental instruction leaders within subjects at the University of North Texas. The supplemental instruction program focuses heavily on math as a subject.
resulting in more supplemental instruction leaders from the sample pool working within math.

Findings from the Kolb Learning Style Inventory

Once the individual interviews were complete the results from the Kolb Learning Style Inventory (2007) were explained to the participant. Based on this discussion, individuals tended to agree with their results of the inventory when asked. Additionally, all participants reported they enjoyed taking the inventory and would be interested in learning more regarding their personal learning style.

While all four learning styles were present in the study, the participant results from taking the Kolb Learning Style Inventory (2007) uncovered that more study participants were of the assimilating style. That means they can be less interested in people and more interested in the theoretical (Kolb, 1981). These individuals, within their own learning, may prefer “lectures, readings, and exploring analytical models” (Kolb, 2007, p. 9). Participants included in the study who were of the assimilating learning style demonstrated aspects of this learning style within how they facilitate study sessions. For example, within her study sessions, Donna focuses on lecture in order to provide students with a way to work through the concepts presented. She talks with the students referring back to her personal set of notes and experiences. Likewise, Lily, within her review sessions stated that, “I will pretty much just talk, I will teach for two hours without stopping.”

More importantly, the participants who were of the assimilating learning style incorporated different aspects into their study sessions not traditionally associated with how they learn. All participants of the assimilating learning style mentioned offering
different ways to teach the students depending on what topic is being covered. Paul related this to his awareness that people get bored and he needs to “mix it up.” This sentiment was echoed by other participants with this learning style. Bill ensures that he incorporates active learning techniques within his sessions as opposed to the more passive techniques that characterize the assimilating learning style. He focuses on board work where the student comes to the board and works a problem for the rest of the group. Bill says that he gives the students no option not to do the problem on the board by stating, “There’s no other option, you’re going to do this math problem for me.”

The second most reported learning style according the results of the Kolb Learning Style Inventory (2007) was the converging style. This style is characterized by being very solution oriented and the preference to work with tasks as opposed to social situations (Kolb, 2007). In their own learning, individuals with the converging style may prefer experimentation, as well as, “simulations, laboratory assignments and practical applications” (Kolb, 2007, p. 9). Participants with the converging learning style demonstrated the incorporation of this style within their study sessions through the implementation of systematic application of tasks for the learner. For example, Jay noted that he explains “each individual part, that way they can get it backwards and forwards.” Breaking down concepts into essential elements is one of the tenets of supplemental instruction (McGuire, 2006). This form of presenting material, by breaking concepts into smaller components may be a result of training as opposed to the incorporation of his personal learning style within session design, but it nevertheless demonstrates an aspect of personal learning preferences being congruent with session facilitation.
The third most reported result of the Kolb Learning Style Inventory (2007) was the diverging style. Individuals with this learning style may enjoy brainstorming activities and gathering information (Kolb, 2007). In their own learning, they may prefer working in groups and listening to others (Kolb, 2007). Rachel, a participant with the diverging learning style, exhibits this learning style within her session facilitation and design. Rachel prefers to create a game and get the students involved through small group work. This idea traces back to that of brainstorming activities. Additionally, Rachel noted that she prefers not to be an authoritative figure within the study session, and this may be a result of her learning style. Her preference is to listen to others and take cues from the students in order to move the session forward.

The least reported result of the Kolb Learning Style Inventory (2007) was the accommodating style. Persons with the accommodating style may enjoy a challenge and in formal learning may prefer to work with others and do field work (Kolb, 2007). Everett, a participant demonstrating the accommodating learning style, designs his sessions to allow the students to “guide” the study session. That is to say that Everett relies heavily on student involvement as opposed to rigidly defining session goals before hand. The individual with an accommodating learning style may be good at setting goals (Kolb, 2007). This is exhibited in how Everett develops a goal for his students, but allows them to dictate the path to the goal. He guides them in the right direction, but does not rigidly assign tasks for the completion of the goal.

Emergent Themes

The four themes that emerged from the course of the study are consistent with experiential learning theory developed by Kolb (1981) and supported by participant
results from the Kolb Learning Style Inventory (2007). While the themes serve as overarching ideas and concepts of elements supplemental instruction leaders incorporated into out-of-class study session design, each is built upon smaller elements that support the overarching theme. That is, each emergent theme holds within it a series of smaller ideas and concepts presented by the participants. The four themes are: 1) an incorporation of personal experience into study session design, 2) the sense of impact on student learning, 3) a feeling of the need to incorporate varied activities into study session design, and 4) the concept that students must take ownership over their own learning.

Personal Experience and Study Session Design

The first theme brings forth the idea that a supplemental instruction leader brings with him or her past experiences and a unique histories when designing or planning out of class study sessions. This theme is consistent with one of the propositions of experiential leaning theory that an individual brings with him or her unique beliefs and ideas (Kolb & Kolb, 2005). Supplemental instruction leaders incorporate personal experience within session planning and design in many different ways. Some supplemental instruction leaders, such as Kerry and Everett, feel it is necessary to incorporate how they choose to organize their life into the way they design their sessions. This may be treating topics as lists of information, or approaching each topic with a systematic process whether or not the professor within the class chooses to present the information in this manner. Kerry, having a converging learning style, approaches session design from a technical view in that she prefers to have a system in place in order to deliver information within her study session.
Looking at problems from a student perspective as opposed to a supplemental instruction leader perspective reinforces both the idea that supplemental instruction leaders care about understanding what their students are going through within the classroom and also that supplemental instruction leaders must still view these struggles through their own lens. They can never truly see the problem the same way a student can. Instead, they can only hope to look at problems from different perspectives in order to gain a better, more holistic grasp. The idea of a supplemental instruction leader viewing problems from another perspective also reinforces experiential learning theory (Kolb & Kolb, 2005). One of the propositions of this theory is that learning must be holistic in that a learner must integrate how they think, feel, perceive and behave in order to have true, pure learning. Through thinking of another perspective of a problem, the supplemental instruction leader is developing a mechanism that will allow for additional learning to occur. For example, Oliver, who has an assimilating learning style, stated that he prefers “looking at it from a student studying standpoint as opposed to an SI standpoint.” Consistent with the assimilating learning style, Oliver prefers to allow students to think through their problems with course content and come to their own conclusion on the topic.

Personal history is also an influence on the design of study sessions. Multiple supplemental instruction leaders commented on how their mothers influenced how they learn and how they, in turn, teach others. This historical influence by a member of one’s own family may lead supplemental instruction leaders to view that method as “best” when in reality, a student attending a study session may have different needs and may not learn in the same manner as the supplemental instruction leader.
Current events appear to influence what a supplemental instruction leader covers within his or her study sessions. This occurred more often in social science courses than in math or hard science courses. This appears to relate to the topics within the courses and the availability of popular culture references for the supplemental instruction leader to call upon when designing or planning his or her session. Paul, who is a supplemental instruction leader within political science with an assimilating learning style, illustrates an example of this when he stated:

I’m a big fan of things like *The Daily Show* and *The Colbert Report*, old George Carlin. Kind of these old observant things on culture and making something mundane relatable, where everyone can laugh at it and see the absurdity and at the same time care. So I try to bring that forward and when I see people smiling about it I can tell those are the points people remember. That’s what makes people go “oh yeah, I remember this, he told me a great story about it.”

Desired Impact on Student Learning

The second emergent theme deals with the impact a supplemental instruction leader has on the learning of the student attending a study session. Feeling good about one’s role was important to the participants within this study. They felt that when a student verbally acknowledged progression with a course topic or course content the supplemental instruction leader felt validated. The differences came in when the acknowledgement occurred. Some participants reflected on a student “getting it” within the session while others focused more on how the student performed on a test after attending review sessions. Kolb and Kolb (2005) in their experiential learning theory write about learning as a process and not outcome based. Kolb and Kolb feel that
through engaging students they will learn best. The test grade is more of an outcomes based approach while learning may be more gradual and a series of small successes that are more apparent while the learning is occurring such as within a study session.

Of interest within this theme is that most participants used the word “confidence” when describing what they are teaching the students who attend their study sessions. Many supplemental instruction leaders within the study feel that the students already know the material; the student just does not have the confidence within him or herself to properly apply the knowledge. The supplemental instruction leader views his or her role as more of a guide who helps the student clarify concepts and gain the confidence necessary to be successful within the course.

The creation of an environment that is conducive to learning is important to supplemental instruction leaders. Included within the conducive learning environment, according to the participants, is knowing the names of the students and developing a personal relationship with the students outside of the study session and class time. Consistent with Kolb and Kolb’s (2005) proposed concept of the learning space, the supplemental instruction leader feels that he or she creates an environment conducive to learning based around relationships formed and developed over the course of the semester. It is a relationship built on mutual trust and understanding, however, the role of the supplemental instruction leader lends itself to be both friend and facilitator. This role is unique in that the supplemental instruction leader is a peer (McGuire, 2006). Although the supplemental instruction leader is a peer, he or she must develop personal competence in classroom management techniques. The supplemental instruction
leader must learn to balance the friendship role with that of study session leader and facilitator.

Incorporation of New and Different Session Elements

The third emergent theme developed out of the idea that supplemental instruction leaders consciously know that they need to incorporate new and different activities within their sessions, but many fail to do so. This appears to be the case due to many different reasons. As Amy, who has a converging learning style, noted in her interview feeling that her course does not lend itself to the development of interactive activities although she feels this would benefit the student. This is consistent with the converging learning style where an individual may be more interested in “technical tasks and problems than with social and interpersonal issues” (Kolb, 2007, p.9) Personal knowledge and personality also play a role within how a supplemental instruction leader chooses to develop a session plan. One participant, Kerry, who has a converging learning style, noted that she does not view herself as a creative person and, therefore, does not feel she can develop fun, interesting games although she realizes this will benefit student learning. This sentiment, like the one before, is indicative of how an individual with a converging learning style prefers to learn. Individuals with a converging learning style tend to prefer the technical side of a situation as opposed to how the people in the situation relate to each other (Kolb, 2007). Similarly, Oliver reported that he understands how to develop the activities, but fails to understand how to incorporate different activities into the study sessions. Participants think about different views and activities to present, whether he or she incorporates them or not, illustrate another proposition of experiential learning theory developed by Kolb and Kolb
(2005). Kolb and Kolb (2005) noted within the theory that conflict must occur in order for learning to occur. Conflict in this case is internal, within the supplemental instruction leader. He or she is seeing something that they don’t fully understand how to utilize, the new activities, and then wrestling with the idea that he or she does not know how to implement the activities within the session.

Students are Responsible for Their Own Learning

The fourth and final theme to emerge from the study is that supplemental instruction leaders believe students are responsible for their own learning. Aligning with constructivist principles, Kolb and Kolb (2005) based experiential learning theory on the premise that learning is a process where the learner becomes responsible for knowledge creation and gain. Most supplemental instruction leaders within this study explored this phenomenon when discussing the students who attend their sessions. The participants view their role as more of a guide for the student whereby the student is in control of his or her own learning. This is in contrast to what is occurring within many college classrooms where the instructor provides the information to the learner and the learner must take in and process the information from an outside source. The structure of study sessions enable the supplemental instruction leader to facilitate the study session instead of directly transmitting information (McGuire, 2006; University of Missouri-Kansas City, 2006). Additionally, supplemental instruction leaders who participated in this study incorporated study session activities that included opportunities for students to learn on their own. For example, Nancy, who has an assimilating learning style, creates incomplete matrices for students to work through on their own time. The majority of the time, Nancy, leaves most if not all of the matrix blank for
students to complete while either working alone or in a small group discussion with other session participants. Consistent with her learning style, Nancy enjoys taking information from various sources and incorporating the information into “concise, logical form” (Kolb, 2007, p.9). This is exhibited through her use of matrices whereby a student works through a larger concept within a framework provided by Nancy.

Conclusions

In establishing a link between supplemental instruction leader learning style and study session design, the study looked at demographic characteristics, actual learning style of participants and personal feelings of session design by the participants through individual interviews. Additionally, document analysis was performed on session planning documents the supplemental instruction leader created before facilitating an out-of-class study session. Based on this analysis and the supporting literature surrounding both supplemental instruction and learning styles, there may exist the incorporation of personal preferences of learning within study session design. Multiple participants indicated designing and facilitating their study sessions based on personal experience and preference. Within this, though, is recognition by the participants that students attending their study sessions do learn differently and that it is their role to accommodate those preferences. Participants related personal examples of needing to adapt to how the student learns and guide the student in the way he or she prefers to learn. Nevertheless, personal preferences of the participants are included within the session. This may be in the form of elements or activities incorporated within the study session such as games and board work.
Evidence of participant learning style being a factor in session design by participants may be due to training by the department. Preferences by individuals with accommodating and converging learning styles appear to lend more favorably with how the supplemental instruction leader is taught and trained to facilitate study sessions. For example, supplemental instruction leaders, through training, are taught to set goals for students, work through concepts with different approaches, and work in groups (University of Missouri-Kansas City, 2006). While participants noted within their individual interviews that they learned how to teach others based on personal experience, there is no way to tell how much of their session design is based on this personal experience and how much of the design is based upon requirements of their position.

The emergent themes based within and supported by the theoretical frame of Kolb’s experiential learning theory (1981) and supported by the results of Kolb’s Learning Styles Inventory (2007) indicate the supplemental instruction leader’s desire to assist students learning and grasping of concepts within the study session. Two of the themes, incorporation of personal experience into study session design and a feeling of the need to incorporate varied activities into study session design, may indicate an incorporation of personal learning style within study session design. The two remaining themes, the impact on student learning and the concept that students must take ownership over their own learning, lend themselves to indicate the supplemental instruction leader is interested in accommodating student needs and understands the need to assist the student attending the study session in his or her own preference of learning.
Overall, personal learning style may have a small relationship in how a supplemental instruction leader designs his or her study session, but equally important to the supplemental instruction is the understanding of where a student is coming from and his or her needs in learning a concept. While the relationship may exist, other factors appear to also influence the supplemental instruction leader when designing, planning, and facilitating his or her out of class study session.

Program administrators and educators who work within academic support and supplemental instruction should incorporate learning style training within initial and ongoing staff development sessions. While most of the participants within the study recognized the value of understanding their own learning style and recognize that students have different learning styles, care should be taken to train supplemental instruction leaders in accommodating the diversity of learning styles found within their out-of-class study sessions. This can be achieved by the supplemental instruction leader through the incorporation of varied activities within the same session. For example, a concept could be explained through the use of discussion, board work, and a game developed on the concept. This way all learning styles are present within the session and the student can learn and reinforce the concept throughout the study session.

A balance must be struck between utilizing personal experiences and preferences and holding to how one is trained to be a supplemental instruction leader when designing out-of-class study sessions. Program administrators may benefit from discussing this balance with their respective supplemental instruction leaders. The discussion could be framed around the supplemental instruction leader’s personal
learning style and the learning styles of the students. We, as educators, sometimes assume our student leaders understand the need for balance between being purely professional and pulling from personal experience. By demonstrating to the supplemental instruction leader how to strike this balance with other students, we not only help with their professional development, but assist them in helping other students engage in and take ownership of their own learning.

As many of the participants within this study noted, students are ultimately responsible for their own learning. This may very well be true, however, by gaining a better understanding of who our supplemental instruction leaders are and how they design and plan their out-of-class study sessions we can assist the students to realize their full potential. If we continually seek to engage our supplemental instruction leaders and teach them how to be better stewards of information we inevitably help the students who attend study sessions unlock their academic potential.

Recommendations for Future Research

While research surrounding the topics of supplemental instruction and learning styles exists separately, no other identified research on the relationship between how a supplemental instruction leader designs his or her study sessions and learning style was identified. Further research should be conducted on this relationship to determine if such a relationship does indeed exist.

Further, research should be conducted from the student perspective. That is, whether students match or mismatch with a supplemental instruction leader’s learning style has an effect on student learning. Through this examination supplemental
instruction programs may be better informed as to the needs of their students and may be able to further improve the academic support of the student.

Second, this study could be conducted with additional supplemental instruction leaders at a campus of differing size and with a different emphasis within the supplemental instruction program. For example, the University of North Texas supplemental instruction program has a large emphasis on assisting students enrolled in mathematics courses. Other institutions, who emphasize different subjects within their supplemental instruction programs, may have a different result.

Additionally, this study could be enhanced through the inclusion of more individuals with differing learning styles. While all learning styles were present within the study, a more equal balance among the participants may have uncovered additional information. That said, all individual participants, regardless of learning style, offered substantial information regarding how they plan and design their out-of-class study sessions.

Finally, it should be noted that while research surrounds learning styles, academic support and more specifically, supplemental instruction; through the continuation of research into these topics and through combining the topics an institution of higher education could refine their academic support programs and better serve the students of their institution. Ultimately, student success is at the core of the mission of higher education, through an improvement of the academic support services we provide to the student population everyone achieves more and is more prepared to face the challenges of the 21st century.
APPENDIX A

DEMOGRAPHIC INFORMATION
Demographic Information

Participant number: _____

Major: ________________________________

Classification: Freshman  Sophomore  Junior  Senior  Graduate

Supplemental Instruction Course: ________________________________

Length of Supplemental Instruction Employment: _______________

Gender:  Male  Female

Age: _____

Marital Status:

O  Single

O  Married

Are you Hispanic, Latino, or of Spanish origin?

O  Yes, I am Hispanic, Latino, or of Spanish origin

O  No, I am not Hispanic, Latino, or of Spanish origin

What is your race/ethnicity? Select one or more.

O  American Indian or Alaska Native

O  Asian

O  Black or African American

O  Native Hawaiian or Other Pacific Islander

O  White
APPENDIX B

INTERVIEW SCRIPT
Interview Script

**Introduction:** I will be asking you to discuss how you approach designing out-of-class study sessions. I have a series of questions for you. If at any time you need me to repeat a question or need clarification, please let me know.

**Questions:**

Describe how you approach designing study sessions.

Where did you learn about this approach?

What elements do you include in designing your study sessions?

How long do you typically spend designing session activities?

Discuss your audience. What are the characteristics of students who attend your sessions?

How do you respond to student questions regarding course content?

Describe a study session you have facilitated. What occurred?

Are there areas of your study sessions of which you are particularly proud? What are they?

Are there areas you would like to improve? What are they?
APPENDIX C

RECRUITMENT FLIER
The Relationship between Supplemental Instruction Leader Learning Style and Study Session Design

Are you eligible to participate in this study?

You are if you have been a Supplemental Instruction Leader for one or more previous semesters at the University of North Texas Learning Center

What is the time commitment?

It is estimated the time commitment to participate in this study will be two hours. This includes completing the Kolb Learning Styles Inventory, a demographic questionnaire, and an individual interview

Who can I contact for more information and to participate?

For more information please contact:

Dr. V. Barbara Bush (principal investigator)
Joshua Adams (key personnel)
APPENDIX D

INFORMED CONSENT FORM
Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose, benefits and risks of the study and how it will be conducted.

**Title of Study:** The Relationship between Supplemental Instruction Leader Learning Style and Study Session Design

**Principal Investigator:** Dr. V. Barbara Bush, University of North Texas (UNT) Department of Counseling and Higher Education.

**Key Personnel:** Joshua Adams, UNT Learning Center and Department of Counseling and Higher Education Doctoral Candidate.

**Purpose of the study:** You are being asked to participate in a research study which involves the examination of learning styles and the relationship between your learning style and how you design out of class study sessions within the scope of your duties as a Supplemental Instruction Leader.

**Study Procedures:** You will be asked to complete a learning styles inventory, a demographic survey, and participate in an audio recording of an individual interview during the course of this study that will take about two hours of your time.

**Foreseeable Risks:** No foreseeable risks are involved in this study.

**Benefits to the Subjects or Others:** We expect the project to benefit you by providing you with information and background on your own personal learning style. Further, this study may be of benefit to the field of Supplemental Instruction by providing other researchers with information on how to better design training and professional development opportunities for their Supplemental Instruction Leader staff surrounding the topic of learning styles.

**Procedures for Maintaining Confidentiality of Research Records:** All personally identifiable information will be kept in a locked cabinet separate from survey results, transcriptions of interviews, and audio recording. Audio recordings will be retained for three years on a computer hard drive. Only the principal investigator and key personnel will listen to audio recordings. All audio recordings will be disposed of by deletion of the files from the computer hard drive. The confidentiality of your individual information will be maintained in any publications or presentations regarding this study.

**Questions about the Study:** If you have any questions about the study, you may contact, V. Barbara Bush.

**Review for the Protection of Participants:** This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-3940 with any questions regarding the rights of research subjects.
Research Participant’s Rights:

Your signature below indicates that you have read or have had read to you all of the above and that you confirm all of the following:

- V. Barbara Bush or Joshua Adams has explained the study to you and answered all of your questions. You have been told the possible benefits and the potential risks and/or discomforts of the study.
- You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw will involve no penalty or loss of rights or benefits. The study personnel may choose to stop your participation at any time.
- You understand why the study is being conducted and how it will be performed.
- You understand your rights as a research participant and you voluntarily consent to participate in this study.
- You have been told you will receive a copy of this form.

________________________________
Printed Name of Participant

________________________________  ________________
Signature of Participant    Date

For the Principal Investigator or Designee:

I certify that I have reviewed the contents of this form with the subject signing above. I have explained the possible benefits and the potential risks and/or discomforts of the study. It is my opinion that the participant understood the explanation.

_____________________________________ ________________
Signature of Principal Investigator or Designee Date
REFERENCES


