SHELTERED INSTRUCTION: A CASE STUDY OF THREE HIGH SCHOOL
ENGLISH TEACHERS' EXPERIENCES WITH THE SIOP MODEL

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Dissertation Prepared for the Degree of

DOCTOR OF PHILOSOPHY

UNIVERSITY OF NORTH TEXAS

May 2011

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The purpose of this study was to determine the current status of secondary teachers’ implementation of the sheltered instruction operational protocol (SIOP) model and its effect on Hispanic English language learners’ (ELL) English language proficiency and academic achievement. In addition, this study sought to determine whether teachers perceive the SIOP model as an effective tool for instruction of high school ELL students to increase English language content and English language proficiency.

This study employed qualitative and quantitative methodologies. Data were collected from four sources: Hispanic ELLs’ English language proficiency scores, students’ English Language Arts scores, an oral interview with participating teachers and teacher observations. Each teacher was observed at four points during the school year with the SIOP instrument. Quantitative data on student achievement were collected employing a pre-experimental, one-group pretest-post-test design. Qualitative data were collected using a time-series design.

Findings revealed that on the two student assessment measures there were increases in English proficiency and English language arts achievement among the Hispanic ELLs. On the assessment of English language proficiency, the students of the teacher with the highest level of SIOP implementation made the highest gains; the students of the teacher with the second highest SIOP implementation level made the second highest gains; and students of the teacher with the lowest level of SIOP implementation made the smallest gains. These findings suggest that the higher the
level of SIOP implementation, the greater the student academic achievement gains. The gains in academic achievement attributed to the proper implementation of the SIOP model can have an extensive impact on English language learners who have not previously experienced academic success. Teacher participants perceived the SIOP model as effective for delivery of content through sheltered instruction lessons for high school ELLs. The teachers agreed that the SIOP model's components provided a consistent structure for planning and delivery of their sheltered lessons.
ACKNOWLEDGMENTS

This dissertation would not have been possible without the encouragement and support of my family, fellow doctoral students, and my professors. Thank you to my wife and family members whose emotional support has sustained me on this long journey. Thank you to my fellow doctoral students who accompanied me on this journey. You taught me that with teamwork and many hours of study our shared dream would become a reality.

Finally, thank you to all my professors in the College of Education and especially to my dissertation committee, Dr. Laney, Dr. Rodriquez, and Dr. Wilhelm who graciously gave of their time and expertise.

Thank you everyone. I will forever be in your debt.
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CHAPTER 1
INTRODUCTION

Students whose primary language is not English need to be provided with the most appropriate instructional programs to succeed in school and become productive citizens in our society. The purpose of this study was to determine the current status of secondary teachers’ implementation of the sheltered instruction operational protocol (SIOP) model and its effects on Hispanic English language learners’ (ELL) English language proficiency and academic achievement. In addition, this study sought to determine whether teachers perceive the SIOP model to be an effective tool for instruction to increase grade-level content acquisition and English language proficiency of ELLs.

Background of the Study

In American schools today, the English language learner (ELL) population is one of increasing diversity. According to an Office of English Language Acquisition (OELA) report (Kindler, 2002) in 2000-2001, states across the country now list some 460 different languages spoken at home by students and their families. The report cited Spanish as the home language spoken by the great majority of ELLs (79.2%).

In addition to the increased language and cultural diversity found among ELLs the report cited other notable characteristics of the ELL population that include whether the student is a recent immigrant or a U.S. born student whose home language is not English, the number of years of formal schooling or lack thereof, the student’s social and cultural background, and level of English language proficiency. These are among the many factors that educators must consider when placing ELLs into the appropriate
instructional program that will provide for their educational needs (Thomas & Collier, 1997).

The reauthorization in 2001 of the Elementary and Secondary Education Act (ESEA), first enacted in 1965, emphasizes the federal government’s concern for more accountability of public education institutions. The ESEA, also known as No Child Left Behind (NCLB), ensures that each school, district and state is held accountable for the academic success of every student. Starting in the 2005-06 school year, students in Grades 3-8 must be tested annually in the content areas of reading and mathematics. Secondary students in Grades 10-12 must be tested once before graduation. States must also report the annual yearly progress (AYP) of all student populations, including ELLs.

As Fry (2007) notes in his analysis of the 2005 National Assessment of Education progress data of standardized testing, the results across the country show that ELLs are far behind their peers. His analysis reports that nationally about 51% of eighth grade ELLs are behind Caucasian students in reading and math based on reported national standardized testing scores. Also, Fry reports that in the fourth grade, 47% of ELLs are behind in math and 35% are behind in reading compared to Caucasian students.

Although efforts to reform education at the secondary level have been made in the past, secondary ELLs remain less likely to be enrolled in special programs designed to meet their needs than ELLs in elementary school (DiCerbo, 2007). Many limited English proficient (LEP) students receive most of their instruction from content area
teachers who have not had the appropriate training to address the needs of second language learners (Echevarria & Short, 1999).

For these English language learners to have equal access to education, they must be provided with effective instructional programs and with teachers who are specifically trained to teach ELLs. Indeed, the NCLB Act specifies that researched-based or scientifically-validated practices proven to impact students' achievement should be provided by public school districts (Fratt, 2007).

Effective instructional programs should provide for the English language development and academic content needs of ELLs. These needs should be met by trained professionals who have knowledge of second language acquisition theories and instructional practices proven effective for teaching ELLs. However, as Echevarria, Powers and Short (2006) state, fewer than 13% of the nation's teachers have received training to prepare them for teaching these linguistically and culturally diverse students.

The current instructional approaches used in many secondary schools to teach the core curriculum to English language learners have been inconsistent (Echevarria, Vogt & Short, 2008), and, as the data clearly demonstrate, the dropout rate for this population continues to grow. In suits filed against state education agencies across the country, the lack of proper implementation and oversight regarding Bilingual/ESL programs highlights the states failures to ensure that ELLs have equal educational opportunities. A suit brought by the Mexican American Legal Defense and Educational Fund (MALDEF) against the state of Texas claims that the Texas Education Agency's legal obligations toward LEP students includes monitoring and evaluating their bilingual/ESL programs and, when needed, requiring changes that will ensure the

According to the Texas Education Agency’s 2008-09 report on enrollment in Texas public schools, there were 4.7 million students. Included were 757,824 students enrolled in a bilingual or ESL class. Total limited English proficiency (LEP) student enrollment was at 800,554 students. In the 2008-09 school year students of Hispanic heritage accounted for 48% of the total student enrollment and Caucasian students accounted for 34%. African American enrollment was at 14.4% and Asian students grew to 3.6%. The report noted that increasingly there are more school age Hispanic children than Caucasian children enrolled in Texas elementary and secondary public schools. This statistic has major implications for post-secondary institutions in Texas regarding future student diversity and campus enrollments in colleges and universities throughout the state.

The Texas Education Agency now requires that all students must pass the Texas Academic Knowledge and Skills (TAKS) tests in the content areas of English language arts, math, science, and social studies in order to graduate from high school. These requirements have created both challenges and opportunities that many schools have never faced before.

Given the importance placed on testing and accountability, teachers in all content areas should receive professional development in effective instructional models for instructing this growing ELL population. Schools, districts, and states should provide the necessary resources to ensure that ELLs are able to attain the levels of academic
achievement required for their educational success. In addition, the NCLB Act requires teachers to be highly qualified in the content areas they teach. A highly qualified teacher, as defined by the NCLB, is one that has at least a college degree with demonstrated knowledge in the content area taught, and they must be certified by the state in which they teach.

National Center for Education Statistics (2002) survey of school staffing for 1999-2000 found that 41.2% of 2,984,781 public school teachers reported teaching ELLs. The report also found that only 12.5% of the teachers surveyed reported having eight or more hours of professional development training in the previous three years. Echevarria et al. (2006) contends that research on effective professional development indicates that eight hours of training is not even a minimum period to learn new approaches and strategies required to teach ELLs. Consequently, they add, “This situation hinders their academic success” (p. 196).

Echevarria et al. (2008) developed the Sheltered Instruction Operational Protocol (SIOP) for use as a tool to observe instruction of ELLs at all grade levels. The SIOP is the result of a seven-year (1996-2003) research project for the Center for Research on Education, Diversity, and Excellence (CREDE) with Drs. Deborah Short and Jana Echevarria as the co-project investigators (Echevarria & Short, 1999). Over time, the SIOP evolved into a tool for lesson planning and instructional delivery in ESL and content area classrooms (Echevarria, Vogt, & Short, 2004; Echevarria & Short, 1999). The SIOP as a model offers a systematic approach for instructing ELLs that incorporates known best practices for teaching both language and content. This structure allows teachers to give careful attention to the distinct second language
development needs of their ELLs and to adjust and modify the level of English academic language until their students grasp the concept being taught. The SIOP model consists of eight essential components or protocols that help teachers provide grade-level material to ELLs of differing levels of English language proficiency. According to the research findings of the CREDE study, ELLs’ academic skills improved when teachers implemented the eight components of the SIOP model. The effectiveness of the SIOP model needs to be validated by additional research studies, conducted in other settings and graded by researchers other than the developers. Therefore the rationale for this study is found in the need to continue investigation of the effectiveness of the SIOP model in both elementary and secondary settings and across the curriculum in the content areas of science, history, mathematics and English language arts.

Statement of the Problem

The research problems addressed in this study are: (a) to determine the effect of participation in sheltered instruction operational protocol (SIOP)-based instruction on secondary Hispanic English language learners’ English language proficiency as measured by the Texas English Learners Proficiency Assessment System (TELPAS); (b) to determine the effect of participation in SIOP-based instruction on secondary Hispanic ELLs in the content area of English language arts achievement as measured by the Texas Assessment of Knowledge and Skills (TAKS); (c) to describe the current status of secondary teachers’ quality of SIOP model instructional planning and delivery and the degree of implementation at four points in the school year using peer
observations; and (d) to describe the current status of secondary teachers’ perceptions of the SIOP model, their own success in SIOP model implementation, and their students’ achievement.

Purpose of the Study

The purpose of this study was to determine the current status of secondary teachers’ implementation of the Sheltered Instruction Operational Protocol (SIOP) model and its effect on Hispanic English language learners' (ELL) English language proficiency and academic achievement. In addition, this study sought to determine whether teachers perceive the SIOP model to be an effective tool for instruction to increase grade-level content acquisition and English language proficiency of ELLs.

The theoretical underpinnings of this study are found in the second language acquisition and learning theories of Krashen (1982) and Cummins (1984). Krashen’s (1982) comprehensible language input hypothesis and Cummins’s (1984) hypothesis on the differences between basic interpersonal communication skills (BICS) and the more demanding cognitive academic language proficiency (CALP) required for academic success are especially relevant to this study. These theories argue that second language acquisition is enhanced through meaningful language use and interaction with native speakers in a variety of different settings (Echevarria et al., 2008).

This study used teacher observations to determine the current status of sheltered instruction implementation by secondary high school teachers by measuring the level of implementation employed by three high school English language arts teachers in their daily lesson planning and instruction of Hispanic ELLs. The degree of teacher
implementation was measured using the Sheltered Instruction Operational Protocol (SIOP) (Appendix B) developed by Echevarria and Short (1999). Oral interviews revealed teacher perceptions of the effectiveness of the SIOP model of instruction for ELLs. Teachers commented on their perceptions of the SIOP model, their own perceived success in SIOP implementation, and their students' achievement under the SIOP model.

This study also examined the English language proficiency and academic achievement of Hispanic ELLs on the Texas English Language Proficiency Assessment System (TELPAS) and English language arts achievement on the Texas Assessment of Knowledge and Skills (TAKS). Both district and high school documents and reports concerning testing and placement of students classified as English language learners (ELL) or limited English proficient (LEP) were examined to verify each student's English language proficiency level (i.e. beginning, intermediate, advanced, and high advanced).

Research Questions

In this study the following research questions were addressed:

1. What is the effect of sheltered instruction operational protocol (SIOP) based instruction on secondary Hispanic English language learners’ (ELLs’) English language proficiency as measured by the Texas English Language Proficiency Assessment System (TELPAS)?

2. What is the effect of sheltered instruction operational protocol (SIOP) based instruction on secondary Hispanic English language learners’ (ELLs’) English language arts achievement as measured by the Texas Assessment of Knowledge and Skills (TAKS)?

3. What is the current status of secondary teachers’ quality of sheltered instruction operational protocol (SIOP) instruction and degree of implementation as measured at four points during the school year?
4. What is the current status of secondary sheltered instruction operational protocol (SIOP) teachers’ perceptions of the SIOP model, their own success in SIOP implementation, and their students’ achievement under the SIOP model?

Rationale for the Study

The rationale for this study is found in the need to continue investigating the effectiveness of instructional programs for secondary English Language Learners. Secondary students must be able to communicate abstract concepts effectively by using academic language appropriate for their grade level. The sheltered instruction operational protocol (SIOP) model has not been investigated extensively in secondary settings. The limited number of studies warrants further investigation of the SIOP model. Previous studies by Echevarria and Short (1999), Miner (2006), Ardisana (2007) and Dennis (2004) have shown that the SIOP model appears to be effective for elementary and middle school teachers and their ELLs, but there is a need for additional studies on the effects of the SIOP model at the high school level. Although the methods employed in this study are similar to those of other studies (Miner, 2006; Ardisana, 2007; Dennis, 2004), this study differs because its focus is on the implementation of the SIOP model at the high school level, with its increased demands on academic and English language skills.

According to the current literature, the vast majority of the previous SIOP studies by Echevarria and Short (1999), Miner (2006), Ardisana (2007) and Dennis (2004) were conducted in large urban school districts at the elementary and middle school level. This study differs, as it examined three high school English language arts teachers and their instructional approach in teaching Hispanic ELLs at one north central Texas high school.
school. It is hoped that this study will make a contribution to an increased understanding of the SIOP model and its implementation at the secondary high school level.

**Definition of Key Terms**

For the purposes of this study the following operational terms are defined:

- **English language learners (ELLs)** - Children and adults who are learning English as a second or additional language. This term may apply to learners across various levels of proficiency in English. ELLs may also be referred to as non-English speaking (NES), limited English proficient (LEP), and non-native speaker (NNS) (Echevarria, Vogt, & Short, 2004)

- **Beginning English language learners (ELLs)** - Beginning English language learners have little or no ability to speak or understand spoken English in academic and social settings. Beginning ELLs have little or no ability to use the English language to build foundational reading skills and have little or no ability to read and understand English used in academic and social contexts. Beginning ELLs have little or no ability to use the English language to build foundational writing skills and lack the English vocabulary and grasp of English language structures necessary to address grade-appropriate writing tasks meaningfully. Retrieved on March 9, 2009, from [http://ritter.tea.state.tx.us/rules/tac/chapter074/ch074a.html#74.4](http://ritter.tea.state.tx.us/rules/tac/chapter074/ch074a.html#74.4)

- **Intermediate English language learners (ELLs)** - Intermediate ELLs have the ability to speak and understand simple, high-frequency spoken English used in routine academic and social settings. Intermediate ELLs have a limited ability to use the English language to build foundational reading skills. Intermediate ELLs have the ability to read and understand simple, high-frequency English used in routine academic and social contexts. Intermediate ELLs have a limited ability to use the English language to build foundational writing skills. Intermediate ELLs have enough English vocabulary and enough grasp of English language structures to address grade-appropriate writing tasks in a limited way. Retrieved on March 9, 2009, from [http://ritter.tea.state.tx.us/rules/tac/chapter074/ch074a.html#74.4](http://ritter.tea.state.tx.us/rules/tac/chapter074/ch074a.html#74.4)

- **Advanced English language learners (ELLs)** - Advanced ELLs have the ability to speak and understand, with second language acquisition support, grade-appropriate spoken English used in academic and social settings. Advanced ELLs have the ability to use the English language, with second language acquisition support, to build foundational reading skills. Advanced ELLs have the ability to read and understand, with second language acquisition support, grade-appropriate English used in academic and social contexts. Advanced
ELLs have the ability to use the English language to build, with second language acquisition support, foundational writing skills. Advanced ELLs have enough English vocabulary and command of English language structures to address grade-appropriate writing tasks, although second language acquisition support is needed. Retrieved on March 9, 2009, from http://ritter.tea.state.tx.us/rules/tac/chapter074/ch074a.html#74.4

- The Texas English Language Proficiency Assessment System (TELPAS) - TELPAS is the assessment system used in Texas to assess elementary and secondary ELLs’ English language proficiency. TELPAS is designed to assess the progress that limited English proficient (LEP) students make in learning the English language. Retrieved on March 9, 2009, from http://www.tea.state.tx.us/student.assessment/admin/rpte

- Texas Assessment of Knowledge and Skills (TAKS) – TAKS is the assessment system used in Texas to assess students’ academic achievement in the core content areas of English language arts, mathematics, science, and social studies. By law, all eligible Texas public school students are assessed in mathematics in grades 3–10 and exit level; reading in grades 3–9; writing in grades 4 and 7; English language arts in grades 10 and exit level; science in grades 5, 8, 10, and exit level; and social studies in grades 8, 10, and exit level. Eligible students may meet testing requirements with Spanish versions of the TAKS assessments, available in mathematics at grades 3–6, in reading at grades 3–6, in writing at grade 4, and in science at grade 5. Retrieved on March 9, 2009, from http://www.tea.state.tx.us/student.assessment/taks/

- Sheltered Instruction Observation Protocol (SIOP) - A researched-based approach for lesson planning and delivery using sheltered instruction strategies that are proven effective in addressing the academic and English language needs of English language learners at all grade levels (Echevarria, et al., 2004)

- Teacher observation – An observation of a teacher using the Sheltered Instruction Observation Protocol (SIOP) model during classroom instruction. For the purposes of this study, a teacher observation consisted of a Sheltered Instruction Observation Protocol (SIOP) trained English as a Second Language (ESL) instructor observing an English language arts teacher during classroom instruction. The ESL instructor applied the SIOP Protocol instrument as a measure of the degree of SIOP model implementation
Limitations

The main limitation of this study was that it was confined to a single English language arts sheltered instruction program being implemented at one high school campus in north central Texas. The study was limited to three teacher participants trained in the SIOP model under investigation. The duration of the study was also a factor as it was limited to one school semester and was conducted only in grades 9 through 12. Thus, this study may have limited generalizability to other school settings, student populations, and other grade levels.

Summary

The American public school system has seen a dramatic increase in the number of English language learners (ELLs). Additionally, the new requirements of the No Child Left Behind (NCLB) legislation have highlighted the need for effective instructional programs to teach this growing population. Finally, law suits by organizations such as the League of United Latin American Citizens (LULAC) and the Mexican American Legal Defense and Educational Fund (MALDEF) have challenged the states of California, Arizona, Illinois, Texas and others concerning their obligation to establish the appropriate bilingual/ESL programs necessary to provide equal educational opportunities for ELLs. These challenges offer unique opportunities for state education policy makers, administrators and teachers.

The purpose of this study was to determine the current status of secondary teachers’ implementation of the sheltered instruction observation protocol (SIOP) model and its effect on Hispanic ELLs’ English language proficiency and academic
achievement. In addition, this study sought to determine whether teachers perceive the SIOP model as an effective tool for the instruction to increase grade-level content acquisition and English language proficiency of ELLs. The rationale for this study is found in the need to continue investigating instructional programs for secondary ELLs, especially the SIOP model, which has been subject to little research at the high school level. Secondary students must be able to communicate abstract concepts effectively by using academic language appropriate for their grade level. Previous studies have shown that the SIOP model appears to be effective for elementary and middle school teachers and their ELLs. Thus, there is a need for studies on the effects of the SIOP model at the high school level.

Chapter 1 presented the background information, the problem statement, research questions, rationale for the study, the limitations of the study and operational definitions. Chapter 2 is a review of the literature related to theories of second language acquisition, instructional programs used in teaching ELLs, and empirical studies on the SIOP model, along with a detailed description of the SIOP model.
CHAPTER 2
REVIEW OF RELATED LITERATURE

A review of the current literature in the area of second language acquisition (SLA) theory, instructional programs for English language learners, and empirical studies of the sheltered instruction operation protocol (SIOP) model are presented in this chapter. Additionally, the last section of the chapter contains a detailed description of the SIOP program for teaching grade-level academic content to ELLs.

According to the Texas Education Agency Enrollment in Texas Public Schools Report for 2008-09, there were 4.7 million students enrolled in school. Included were 757,824 students enrolled in a bilingual or ESL class. Total limited English proficiency (LEP) student enrollment was at 800,554 students and this population group is growing according to the report. Indeed, across the country the ELL population in United States public schools is projected to increase to 40% of the school age population by the 2030s and most districts are currently under-educating this diverse student population (Thomas & Collier, 2002).

Additionally, the report states that between 1998-99 and 2008-09, Texas public school enrollment increased 20% while the LEP population increased by 50%. In the 2008-09 school year, students of Hispanic heritage accounted for 48% of the total student enrollment and White students accounted for 34%. African American enrollment was at 14.4% and Asian students grew to 3.6% (see Figure1).
As previously stated, the ELL population is one of great diversity. Among the varied characteristics of these students are the language spoken at home, whether the student is a recent immigrant or native U.S. born student, amount of formal schooling and the student’s English language proficiency level. These are all key factors for consideration when placing the ELL student in the most appropriate instructional environment (Kindler, 2002; Thomas & Collier, 1997). With the great diversity of these students’ language, education and socio-cultural backgrounds, Echevarria, Vogt, and Short (2008) state:

Given the variability in these students' background, it is clear that there is no simple, one-size-fits-all solution. They need different pathways for academic success. To meet this challenge, fundamental shifts need to occur in teacher development, program design, curricula and materials, and instructional and assessment practices. (p. 8)
Thus, it is critical that researchers continue to study and develop effective programs to meet the educational needs of this diverse student population. Improved educational experiences are essential for improving ELLs’ performance and narrowing achievement gaps. Research findings can and should inform these improvements (Genesee, Lindholm-Leary, Saunders, Christian, 2005).

Theories of Second Language Acquisition

Researchers David and Yvonne Freeman (2001) note that studies concerning how language is acquired have been made from three distinct perspectives: psycholinguistic, neurolinguistic, and sociolinguistic. They note that psycholinguists seek answers to questions concerning the psychology and linguistics of language. How a language is represented in the brain is an area studied by neurolinguists, and sociolinguists study how social and cultural factors influence language.

Krashen’s (1982) theory of second language acquisition (SLA) makes a major distinction between acquiring and learning a language. According to his theory acquiring a language is a natural process of the human condition. He notes that learners come to acquire a second language through language input that is comprehensible to the learner provided by daily language experiences (i.e. listening, speaking, reading and writing) of the individual learner. Language is therefore acquired naturally and over time. This theory is derived from the psycholinguistic and neurolinguistic perspectives; it claims that people have an innate ability to acquire language (Freeman & Freeman, 2001). Hadley (1993) cites similar theories posited by Chomsky (1965) and McLaughlin (1978), which she terms as the rationalist perspective. As Hadley notes, the rationalist
perspective assumes that language development is innate or genetically programmed. This rational view is the opposite of an empiricist’s view that sees language as being learned through personal experience. Noted behavior psychologists B. F. Skinner and Ivan Pavlov were empiricists (Hadley, 1993). Krashen (1982) notes, that comprehensible input (i.e. communication slightly above what is known) is the central component necessary for second language acquisition to occur. In his theory of second language acquisition Krashen (1982) established five hypotheses:

1. The acquisition learning hypothesis- there are two ways of developing ability in second languages. Acquisition is a subconscious process identical in all important ways to the process children utilize in acquiring their first language, while learning is a conscious process that results in “knowing about” language.

2. The natural order hypothesis- states that we acquire the rules of language in a predictable order, some rules tending to come early and others late. The order does not appear to be determined solely by formal simplicity and there is evidence that it is independent of the order in which rules are taught in language classes.

3. The monitor hypothesis- states how acquisition and learning are used in our acquired competence, from our subconscious knowledge. Learning, conscious knowledge, serves only as an editor, or monitor. We appeal to learning to make corrections, to change the output of the acquired system before we speak or write (or sometimes after we speak or write, as in self-correction).

4. The input hypothesis- this hypothesis states that humans acquire language in only one way- by understanding the messages, or by receiving comprehensible input. We progress along the natural order (hypothesis two) by understanding input that contains structures at our next stage- structures that are a bit beyond our current level, to i+ 1… We are able to understand language containing unacquired grammar with the help of context, which includes extra-linguistic information, our knowledge of the world, and previously acquired linguistic competence.

5. The affective filter hypothesis- states that comprehensible input is necessary for acquisition, but it is not sufficient. The acquirer needs to be open to the input. The affective filter is a mental block that prevents acquirers from fully utilizing the comprehensible input they receive for language acquisition. When
it is up, the acquirer may understand what he hears or reads, but the input will not reach the LAD (language acquisition device). This occurs when the acquirer is unmotivated, lacking in self-confidence, or anxious... The filter is down when the acquirer is not concerned with the possibility of failure in language acquisition and when he considers himself to be a potential member of the group speaking the language... the filter is lowest when the acquirer is so involved in the message that he temporarily forgets he is learning or reading another language. (p.1-4)

Krashen believes that there are two conditions that must be met to acquire language, comprehensible input (i + 1) and a low affective filter that allows the input to be mentally processed. When is teaching a language helpful? Krashen (1981) explains that, “teaching a language helps when it supplies the necessary comprehensible input which he believes is the cause of second language acquisition” (p. 34). Krashen (1985) adds, “This is especially true for beginners, who often find real world input too complex to understand” (p. 13). He notes that language classes are less beneficial to intermediate and advanced students who have had more input. The input-hypothesis has many implications for today’s classroom teachers who instruct ELLs on concepts and ideas that are often abstract and complex even for native English speakers to understand initially.

Clearly comprehensible input is a necessary component of second language acquisition, but Krashen’s affective filter hypothesis is equally important, especially in the classroom setting where addressing the need for academic content and English language proficiency are the overriding concerns for the teacher. Teachers would argue that academic language skills are critical for students to succeed. In this era of testing and higher standards, educators must ensure that schools comply with federally mandated education policies to receive the federal funding for the programs and
Researchers Thomas and Collier (1997; 2002), have studied ELLs and their learning environments for many years and believe that a model of second language acquisition should also contain an academic component that addresses the academic demands made upon students in their classrooms. In order to address the academic language needs in the school setting, they have developed the Prism model. Thomas and Collier (1997) propose their model as a framework for improving upon the existing instructional strategies and for developing new ones to meet the assessed long-term needs of English learners (see Figure 2).

![Prism Model](image)

Source: School Effectiveness for Language Minority Students (Thomas and Collier, 1997)

*Figure 2. Prism model.*

Language development, according to the Prism Model has four aspects: sociocultural, linguistic, academic, and cognitive. In their discussion of the four components in the Prism Model researchers Ovando, Collier, and Combs (2003) noted that when developing a second language, the sociocultural processes of students may
include variables such as self-esteem, anxiety, and/or other affective factors. The second component, linguistic processes are those innate conscious and subconscious aspects of language development required in a formal educational setting. Here, they stress the importance of the individual’s first language in the acquisition of a second language. Academic development, the third component, is essential for success especially in the core academic areas. Ovando et al. (2003) note, “Academic knowledge and conceptual development transfer from the first language to second language….Research has shown us that postponing or interrupting academic development is likely to promote academic failure” (p.124).

The ability to transfer skills from the first language (L1) to the second language (L2) is critical for teachers to remember when instructing ELLs at different grade levels and language proficiency levels. The fourth component is cognitive development, a naturally occurring, subconscious process beginning at birth that continues to develop language and knowledge skills throughout life. Highlighting the importance of academic language skills in their Prism Model, Thomas and Collier (1997) write:

This academic vocabulary is central to text and plays an especially prominent role in the elementary, middle, and high school years as students read to learn concepts, ideas, and facts in content-area classrooms such as math, science, and social studies. (p. 9)

Cummins (1984) found the distinction between basic language skills and the more complex language skills in the academic areas a significant one when it concerns minority language students. Cummins refers to the conversational language skills as basic interpersonal communicative skills (BICS) and cognitive/academic language proficiency as (CALP).
The former was defined in terms of “the manifestation of language proficiency in everyday communicative contexts” whereas CALP was conceptualized in terms of the manipulation of language in decontextualized academic situations (pp. 36-37). The differences between verbal English skills and cognitive academic English skills are critical for teachers to recognize and understand. Cummins emphasizes that the low academic performance resulting from these differences must be noted by teachers and not mistakenly attributed to deficient cognitive or personality traits of the students. Echevarria, Powers and Short (2006) noted that academic English also pertains to the semantic and syntactic knowledge of the language as well as the functional uses of the English language. ELLs, they add, must demonstrate their higher order thinking skills in English, by drawing conclusions, making predictions, and summarizing academic text. ELLs “must pull together their emerging knowledge of the English language with the content knowledge they are studying to complete academic tasks associated with the content” (p.199).

Given the dichotomy posed by the BICS/CALP distinction of language proficiency and the implication it has for ELLs’ learning, many educators have asked the question, “How long does it take minority language students to acquire English proficiency?” This is a complex question and the answer requires consideration of several factors thought to influence second language acquisition and learning. Cummins (1984) found that it takes a considerably longer period of time (5-7 years) for ELLs to perform at the same academic level as their native English speaking peers when compared to the time required to have a basic conversation (2-3 years) with their English speaking peers.
In a landmark study of school effectiveness for language minority students that began in 1982, Thomas and Collier (1997), found similar results concerning the period of time required for BICS/CALP difference. They used the standards set by *Castaneda v. Pickard* (1981) decision in their study of public schools instructional programs (Montavon, 2003). Among the factors examined in their longitudinal study of five large school districts with more than 700,000 student records were: length of (L1) instruction, (L2) instruction, socioeconomic status, and type of instructional program. Thomas and Collier (1997) state:

We found that students who arrived between ages 8 and 11, who had at least 2-5 years of schooling taught through their primary language (L1) in their home country, were the lucky ones who took only 5-7 years. Those who arrive before age 8 required 7-10 years or more! ... The only difference between the two groups was that the younger children had received little or no formal schooling in their first language (L1), and this factor appeared to be a significant predictor in these first studies. (p. 33)

Thomas and Collier (1997) also found that the shortest period of time for typical ELLs who were schooled only in English in the U.S. to match the achievement of typical native English speakers is five years, if the ELLs were among the most advantaged immigrant students, having had at least 2-3 years of on grade level schooling in their primary language before they arrive in the U.S. The researchers state that “many ELLs schooled only in English rarely reach grade-level achievement, as measured by typical native-English speaker performance” (p. 34). Additionally, they found the type of instructional programs currently used in U.S. schools plays a significant role in the development of language (L1 and L2) and academic achievement of ELL groups in their studies. Thomas and Collier conclude that in those programs where language-minority students receive strong cognitive and academic development in their first language over
a period of years, as well as through the English language, the students continue to
perform well in the high school years.

In a subsequent study, Thomas and Collier’s (2002) research findings indicated
that ESL and bilingual services did raise students’ achievement levels by significant
amounts. However, they cautioned that:

Students with no proficiency in English must NOT be placed in short-term
programs of only 1-3 years. In this study and all other research studies following
Ells long term, the minimum length of time it takes to reach grade-level
performance in second language (L2) is 4 years… The strongest predictor of L2
student achievement is amount of L1 formal schooling. The more L1 grade-level
schooling, the higher L2 achievement. (p. 7)

Given the long term implications for these students, school districts may wish to review
these research findings when considering program models for this diverse student
population.

Krashen’s (1982), Cummins’s (1984), and Thomas and Collier’s (1997) theories
of second language acquisition provide guidance for classroom teachers in the
practices they employ in their daily lesson plans to instruct their ELLs. Teachers should
make the English language comprehensible using all four of the language domains of
speaking, reading, listening, and writing. They should use a variety of instructional
approaches and strategies to accommodate the different learning styles of ELLs, using
kinesthetic, audio, and visual aids to engage their students (Vang, 2006). Teachers
should have high expectations for all students, particularly ELLs, while understanding
the varied academic and English language proficiency levels of their students. Finally,
ELLs’ academic performance can be improved when teachers access and make
connections between the students’ prior knowledge and the content being taught.
Bilingual and ESL Education Programs

Federal and state education policies and the funding of programs for ELLs have guided school districts’ decisions concerning programs for their ELLs. States have developed a variety of educational programs for their ELLs. Among these programs are English as a Second Language (ESL) pullout and ESL as a class period (secondary level). Boyson and Short (2003) noted that many schools have experienced increasing numbers of recent immigrant students at the secondary level who possess little knowledge of the English language or American school systems. For these recent immigrant students Newcomer programs have developed in large urban school districts such as Dallas and Houston to meet their particular needs. A newcomer program affords recent immigrant ELLs a means of becoming familiar with American schools and provides them with basic English language skills.

Newcomer programs seek to prepare these recent immigrant students for a better transition experience into the mainstream school environment. These adolescent students are typically placed in newcomer programs for one or two semesters before being placed in the appropriate educational setting based upon their English language proficiency and grade level (Boyson & Short, 2003).

ESL pullout programs, as the name indicates, remove ELLs from the mainstream classroom setting to receive additional English language support. These programs are generally seen at the elementary levels and are 30 to 45 minutes a day (Crawford, 2004). However, with ESL pullout programs, students lose instruction time and fall behind in their regular classroom work. Depending on the ESL teachers’ skills, students may or may not receive any content instruction in their native language. Additionally,
Crawford (2004) states:

At most, ESL pullout should be used as a stopgap in schools caught unprepared for a sudden influx of immigrants until a more effective program can be offered. Unfortunately, in many districts it has become a way of life, a policy of doing the bare minimum for English learners. (p. 38)

Another English as a second language program is ESL as a class period. ESL as a class period is generally used at the secondary level and serves ELLs at all English proficiency levels. In Texas, teachers who are certified to teach ESL classes are trained in second language acquisition theory and sheltered English strategies. The focus for this program is on building English language skills and learning grammar. Students generally are grouped according to English proficiency level and receive course credit for the class. However, these programs are based on a deficit model where students’ native languages are seen as a learning deficiency that has to be remediated (Crawford, 2004). The emphasis in these programs is for ELLs to learn English quickly and to exit or transition to mainstream classes, generally in one year. Concerning limitations associated with these approaches Crawford (2004) states:

From a strictly academic standpoint, ESL students were learning English too slowly to keep up in other content areas. So there was little improvement in their long-term achievement… Meanwhile language difficulties were often ignored; students were simply labeled slow learners, or worse. Based on Intelligence Quotient (IQ) tests administered in English, disproportionate numbers of language-minority children ended up in special education classes. As late as 1980, Hispanic children in Texas were over represented by 315% in the learning-disabled category. (pp.99, 100)

The goal of the ESL pullout and ESL as a class is English language development. Students receive little support in the core academic content areas (Crawford, 2004).

Prior to the *Lau v. Nichols* (1974) court decision mandating school districts to provide appropriate bilingual programs for students whose primary language was not
English, the dominant approach to educating these students was the submersion approach, better known as the sink or swim method. Crawford (2004) writes that submersion lessons offer no provision for instruction in the students’ native-language and no sheltered language instruction to aid ELLs in learning the English language or course content materials. He also notes that in the *Lau v. Nichols* decision the court ruled that school districts must provide students whose primary language is not English the same educational opportunity as that afforded to English speaking students. In the Lau case the students’ home language was Chinese. The court determined that the school failed to provide Chinese-speaking students the opportunity to learn because the only medium of instruction was English.

During the 30 year period from the 1970s until 2000 bilingual education programs that used varying amounts of ELLs’ primary language and English language for instruction emerged in the form of transitional bilingual, developmental bilingual education and two-way or dual language education programs. These new programs were a direct response to the 1974 *Lau v. Nichols* decision. Bilingual programs serve mainly elementary students and provide instruction in ELLs’ primary language until their English level was sufficiently proficient to transition out of the bilingual program and into the mainstream classes.

Crawford (2004) notes, the vast majority of programs available to ELLs up until the education reform movements of the 1980s and 1990s, however, were similar to the submersion approach and ESL pullout programs that provided most instruction in English, and they have not been successful in meeting the academic needs of ELLs.
During the 1980s, as Crawford notes, structured English immersion programs or sheltered English immersion programs began to appear. These structured English immersion programs are self-contained classes for ELLs using English as the language of instruction. Teachers adjust their English usage to support student content learning. English is simplified to improve understanding and instructional support is provided according to ELLs’ English proficiency level. This model is generally considered superior to other models using English as the medium of instruction (Thomas & Collier, 1997) and has proven effective primarily for students who are intermediate and advanced in their English proficiency levels. The emphasis of sheltered English immersion is to teach content material using simplified English to make instruction understandable. ELLs receive the required content instruction in English language appropriate to students’ English proficiency level. The focus of these instructional models supports both ELLs’ need for comprehensible English language input (Krashen, 1982) and the necessary grade-level academic content (Cummins, 1984).

Given the diversity of student needs and English language proficiency levels, researchers continue to adapt existing models to better serve the educational and English language needs of ELLs. Recently, research has focused on professional development training for teachers in the content areas to equip them with the additional skills necessary to instruct the growing numbers of ELLs.

In the 1990s researchers O’Mally and Chamot (1990) developed the cognitive academic language learning approach (CALLA). The emphasis of their program is on training teachers in the effective instructional strategies required in the more cognitively demanding secondary academic content areas. CALLA was specifically designed for
middle and high school teachers as an effective means of providing ELLs with the higher order thinking skills required for academic success at the secondary grades.

The CALLA program is an ESL approach that makes extensive use of effective learning strategies to support ELLs by addressing academic and cognitive needs, and developing their content knowledge and English language (Ovando et al., 2003). The CALLA model specifies three types of learning strategies for teachers to incorporate into their daily lessons plans and activities: metacognitive strategies, cognitive strategies, and social/affective strategies (Ovando et al., 2003). With the CALLA approach teachers cycle through the model’s five stages: preparation, presentation, practice, evaluation and expansion. After the introduction of the CALLA approach researchers increasingly became aware of a growing need for specialized training for all teachers working with ELLs. Teachers in all disciplines require some specialized training to ensure that they provide ELLs with the cognitive academic language proficiency (CALP) skills (Cummins, 1984) necessary for academic success in the secondary content areas.

More recently, ELL programs have emerged that focus on the ELLs need for academic knowledge in all discipline areas in addition to English language proficiency. One such program is the sheltered instruction operational protocol (SIOP) model developed by researchers (Echevarria et al., 2008). Like the CALLA model, SIOP incorporates an instructional sequence that includes careful teacher lesson preparation and presentation. Additionally, the SIOP provides for effective instructional strategies and the cognitive academic skills (Cummins, 1984) as well as practice and student evaluation elements to help motivate students to become independent learners.
According to the Center for Applied Linguistics (CAL) the SIOP model is a research-based instructional program proven effective in addressing the academic and English language needs of ELLs in all content areas. The SIOP model is the result of a 7-year project conducted from 1996 to 2003 by researchers Echevarria and Short. The model offers a systematic approach for instructing ELLs that incorporates proven best practices for teaching both language and content. The instructional components include: lesson planning, building background, comprehensible language input, learning strategies, interaction, practice and application, lesson delivery, and review/assessment.

Echevarria et al. (2008) explain that with the SIOP model teachers are trained to apply each of the components consistently in their lessons to provide the academic content and English language support for ELLs. The structure of the SIOP model allows teachers to give careful attention to the distinct second language development needs of their ELLs and to adjust and modify the level of English academic language until their students grasp the concept being taught. The SIOP model contains specific instructional components that provide teachers with a consistent approach to create lesson plans containing both content objectives and language objectives. Teachers in all content areas can be trained in the model that allows teachers to use English as the medium of instruction with effective sheltered instruction techniques. This model improves on previous sheltered/content approaches by providing a systematic approach that is research-based and found effective for developing ELLs’ academic English language skills and grade-level content acquisition in all content areas.
Empirical Studies on the SIOP Model

Researchers Echevarria, Vogt and Short have continued to conduct longitudinal studies since the findings of their original SIOP research were published. Studies by other researchers include research on SIOP professional development for teachers and analyses of student academic achievement in subject content and English language proficiency. The Center for Applied Linguistics (CAL) notes three ongoing investigations on the SIOP model that are listed below.

The first is a study of two school districts in New Jersey. The purpose of the study, according to the CAL is to investigate the relationship between professional development in the SIOP model and academic achievement of secondary English language learners. In this study one school district received professional development treatment in the SIOP model, the other district did not. Both of these school districts have two middle schools and one high school with similar ELL populations. In the treatment site two teacher cohorts were established for the study. Cohort 1 received training the first year and occasional coaching the second year while Cohort 2 only received training the second year of the study. Teachers in subject areas of math, science, social studies, language arts, ESL, and technology participated in ongoing SIOP training. The district provided additional support for teachers with three part-time on-site coaches in the first year of the study and added two more coaches as more teachers participated in the study. The coaches primarily facilitated after-school meetings and offered guidance in lesson design and material resources. Some coaches were able to make classroom visits. Further support for teachers was also provided via closed Listserv, a project dedicated Website, and online chats. The teachers in the
comparison site did not receive any SIOP training.

CAL researchers collected teacher implementation data using classroom observations. Two observations for each teacher were made during the school year. One observation was made in the fall, another in the spring. The SIOP was used at both sites. Even though the comparison teachers were not trained in SIOP, it was used to evaluate the level of sheltered instruction they provided in their lessons so their overall teaching could be compared to the SIOP teachers in the treatment site. In addition, pre- and post SIOP lesson plans were collected at the treatment site to measure how well teachers incorporated SIOP components in their lesson preparation.

The preliminary findings of this study have shown that Cohort 1 teachers, on average, increased their level of SIOP model implementation as measured by the protocol almost 20%. The growth was approximately the same by school level: middle school teachers improved by 20% on average and high school teachers by 18%. The range of the individual SIOP components on average percentage growth gain was from 12% (for comprehensible input) to 39% (for lesson delivery). Additionally, the teachers' level of SIOP implementation in their lesson planning had improved by more than 50% during the first year. The number of high SIOP model implementers increased to a greater extent in the treatment district than in the comparison district. High implementation was considered as a score of 75% or higher on the SIOP rating scale and low implementation was considered as 50% or below. After one year of SIOP professional development, 56% of Cohort 1 and 74% of Cohort 2 teachers in the treatment district implemented the model to a high degree. After two years, 71% of Cohort 1 reached a high level. In contrast, at the comparison site only 5% of the
teachers reached a high level of implementation after one year and only 17% after two years. ELLs’ academic achievement data were collected on the New Jersey state test results in reading, math, social studies, and science for Grades 6-7, reading, math, and science for Grade 8, and reading and math for 11th and 12th grades. Also, scores on the state approved English language proficiency assessment, the IPT (Idea Proficiency Test), for all ELLs in Grades 6-12 were collected. With the baseline year of 2003-04 to year one of the study in 2004-05, the preliminary analyses showed that students who had SIOP model trained teachers in the treatment site demonstrated a statistically significant percentage of growth in average IPT scores for the oral, reading, and writing subtests. Additional findings from this study are forthcoming.

The second of the ongoing studies is a five-year (2003-08) experimental study supported by the U.S. Department of Education. In this investigation the SIOP model was part of a larger intervention design to enhance academic language/literacy development and content knowledge in elementary school students in ESL and bilingual programs. This longitudinal study incorporates an experimental design to evaluate traditional and enhanced models of ESL and bilingual programs in the elementary K-3 grades. Approximately 12 schools in one district participated. Some elementary schools offered an early-exit bilingual (Spanish-English) program model; other schools offer a traditional ESL program for elementary students. ELLs and their teachers were randomly assigned to a traditional or intervention class based on the type of program. As students progressed to upper grades, they would remain in the traditional or intervention cohort, with new teachers assigned each year. The study followed the cohort of students through the four years from Grades K-3. Researchers collected data
from classroom observations using the SIOP and other researcher-developed measures to determine the teachers’ level of implementation of interventions along with ELLs’ data, collected in various forms. The researchers gathered results from pre- and post-assessments on treatment and control students’ Grades K-3 development in both English and Spanish for literacy/language. The data collected included the Woodcock Language Proficiency Battery and other measures of early reading. Data from the reading and mathematics tests and the state English language proficiency exam were also assessed when students entered Grade 3. The findings from this 5-year study were to be made available in 2009.

The third ongoing study noted by Echevarria was a 5-year study (2005-10) also funded by the U.S. Department of Education. This study investigated the impact of the SIOP model on student academic achievement in middle school science classes. Researchers created science curriculum units with SIOP lesson plans along with science language assessments that focused on the acquisition of science concepts and language development of ELLs. The study consisted of three separate phases. Phase 1 of the study, completed in 2005-06, was a pilot study designed to develop and refine science curriculum lessons that incorporate the SIOP features and to field test academic science language assessments. Phase 2 of the project (2006-08) involved two 1-year studies.

The first year of the study, approximately 10 schools participated as treatment or control sites. Treatment group teachers received the SIOP training and the SIOP science lessons, organized around four seventh grade curriculum units and coaching support. In Year 2 of the study, approximately 15 schools from a different district
participated as Treatment 1, Treatment 2, or control sites. Treatment 1 teachers received the SIOP training, along with the SIOP science lessons, and coaching support. Treatment 2 teachers only received SIOP training and coaching support. An analysis of the two treatment groups examined whether SIOP lessons helped teachers learn the SIOP model at a faster pace or to a better degree. Finally, Phase 3 was completed in the remaining two years of the study terminating in 2010. Phases 2 and 3 data collection and analyses included the teachers’ implementation ratings, as measured by the SIOP and student state test results in reading, science, and English language proficiency. The researchers also collected data from local districts on content tests and the project-developed science language assessments. The study’s findings should be made available in 2011.

These large-scale studies should yield new information on the efficacy of the SIOP model as an instructional tool for content teachers of ELLs. Several smaller studies on the SIOP model must also be noted. They include studies related to the SIOP model in the areas of teacher administration, teacher self-efficacy, and teacher training.

A study by Torres (2006) is entitled *Administrative Support for English Language Learners: How the SIOP Model Empowers Teachers, Administrators, and English Language Learners*. The participants were three public school principals. The study provides a detailed account of the three principals’ level of understanding on sheltered instruction and the SIOP for teaching ELLs. The investigator sought to examine the principals’ knowledge of the SIOP model and to compare principals’ ratings using the SIOP, and lastly, to examine how the SIOP may be modified and revised for use as an
instrument to evaluate teacher performance. The findings of the study demonstrated that principals need on-going, systematic, professional development in sheltered instruction in order to be able to assess its implementation effectively. The SIOP was used to measure the principals’ ability to identify key components of sheltered instruction and to identify areas of strength and weaknesses, not only in their classroom observations, but also in their own individual understanding of sheltered instruction.

A case study by Miner (2006) studied teachers’ efficacy and system-level support for teaching elementary ELLs. The study examined the relationship between implementation of the SIOP model, teachers’ self-efficacy, and elementary ELLs’ language participation and academic performance at grades 3, 4, and 5 in reading and mathematics. Principals, teachers and ELLs from four elementary schools were the focus of the study. Two of the schools implemented the SIOP model while the other two served as comparison sites. Data were gathered through a teacher efficacy survey, teacher self-ratings on the SIOP, field observations of students in their classrooms, student performance on the Oregon state assessment in reading and mathematics in the fall and the spring of the year, and qualitative interviews and questionnaires. Findings suggest that efficacy for teaching elementary level ELLs increased with the introduction of the SIOP model strategies. The researcher noted that systems-level conditions may enhance or limit teacher efficacy development. Systems-level conditions included a lack of time to plan and adapt lessons, a lack of opportunity to collaborate with peer teachers, little accountability, limited materials, and limited assistance from knowledgeable specialists.
Kraft (2005) conducted a study of teachers’ perceptions of the teacher induction program training and support, and teacher efficacy when working with diverse students. The purpose of the study was to compare the level of efficacy of second year teachers with respect to their culturally and linguistically diverse students, and between groups of teachers participating in different induction programs. The study also sought to determine whether a relationship existed between the teachers’ sense of efficacy with diverse students and the support and training they received from the induction programs. Data were collected using the Ohio State Teacher Efficacy Scale and the SIOP. The study’s findings indicated the teachers felt less efficacious in instructional strategies and student engagement but equally efficacious in classroom management as did those teachers who served as the sample group. The findings suggest that teacher induction program administrators need to provide novice teachers serving diverse students with opportunities to create and implement lessons with language objectives. Moreover they should provide more training on instructional strategies that support meeting those objectives.

A study involving elementary math teachers and SIOP conducted by Ardisana (2007) examined the relationship between learning strategies embedded in mathematics lessons and 4th and 5th grade students’ academic writing scores. Data were collected from teacher interviews, feedback forms from students and teachers, participant/observer reflections, and observations using the SIOP. Teachers in the treatment group were taught the learning strategies of pattern seeking and the use of elaboration and were guided in the use of graphic organizers in mathematics lessons. Writing scores were collected from 136 students in the treatment group and 176
students in the control group. The study findings indicated little difference in writing scores between groups; however, a correlation between teachers’ effective use of strategies and their students’ achievement was found. Treatment teachers showed an improvement in their teaching effectiveness using the provided learning strategies. Also, the study found an increase in students’ willingness to use academic language to share learning strategies and students’ improvement in cooperative skills were observed.

Finally, a study conducted by Dennis (2004) investigated the effects of two middle school history teachers’ implementation of the SIOP model on vocabulary development of their ELLs. The study sought to determine whether the SIOP model was an effective tool for planning instruction for ELLs to increase the vocabulary they need to comprehend material delivered within their content classes. Additionally, the study examined whether teachers who use the SIOP model for lesson planning and delivery consider their teaching more effective than when they do not use the SIOP model. The hypothesis was that ELLs whose teachers use the SIOP model for lesson planning would score higher on a content-based vocabulary test than when instructed without the SIOP model, and students whose teachers who use the SIOP model would have a higher rate of comprehension of the subject matter than when instructed without the SIOP model. A second hypothesis was that teachers who use the SIOP model for lesson planning would consider their teaching more effective than when they did not use and implement the model. Participants were two middle school history teachers and their ELLs. Teacher 1 was bilingual in Spanish/English with 9 years teaching experience. Teacher 2 was bilingual in Greek/English with 7 years experience. The teachers were trained in the SIOP model three years prior to this study and participated
in the original study by Echevarria and Short (1999) for approximately three years.

The study used both qualitative and quantitative methods to collect data. Data were collected on the students' vocabulary knowledge and comprehension of a particular lesson by way of pre-and post-tests in order to gather the quantitative data. Teacher data in the form of teacher reflection questions were assigned so the researcher could gain a deeper understanding of the teachers' attitudes toward teaching a lesson both with and without the guidance of the SIOP model.

The study used a paired samples $t$-test to measure the effects of the SIOP lesson-planning guide on the vocabulary development of ELLs. The study compared two lessons (pre and post-test) taught by both teachers (Lesson 1 was the non-SIOP lesson, and Lesson 2 was the SIOP lesson). The qualitative data consisted of examining teacher attitudes toward the SIOP lesson and the non-SIOP lesson, based their responses to reflection questions. Teachers commented on their overall opinion of their lessons. Differences in their observations of the effectiveness of their lessons were observed and noted.

The study findings indicated that with the implementation of the SIOP model in a sheltered history class, middle school ELLs' vocabulary development and comprehension increased. Also, the teachers considered their lessons more effective when they used the SIOP model as a guide for planning and implementing their lessons.

These studies in the areas of teacher preparation, teacher self-efficacy, educational leadership, and the effects of the SIOP model on student achievement demonstrate the need for continued examination of teachers' and administrators'
understanding of the educational needs of their ELLs. This is particularly true with respect to how teachers at the secondary level conceptualize and implement these programs to meet those needs.

The aforementioned theories of second language acquisition, existing models of Bilingual / ESL instruction and empirical studies of the SIOP model have shown how effective instruction for ELLs can be structured to provide the appropriate level of English language input and grade-level academic content necessary for student achievement. The SIOP model was developed for use by elementary and secondary classroom teachers providing them with a flexible format that allows for the individual English language and academic content needs of a very diverse ELL population.

Sheltered Instruction Operational Protocol (SIOP) Model

In a 2001 report titled *Meeting the Needs of Students with Limited English Proficiency*, the United States General Accounting Office found that the available research did not definitively indicate the best methods for teachers to use when instructing limited English proficiency students.

The report concluded:

> Whether a school district chooses an English-based or bilingual approach to teach students with limited English proficiency, instructional quality will ultimately affect children’s academic achievement. Characteristics that contribute to high-quality programs, according to some educators, include adequately trained teachers, clearly articulated goals, systematic assessments, and opportunities for children to practice English. (p.13)

Characteristics of high-quality programs as indicated in the report are those programs that provide training for teachers that result in high quality instruction, opportunities for students to practice English, and assessments that measure students learning.
Echevarria et al. (2006) note both the lack of an explicit sheltered instruction model and the limited number of research studies that measure what constitutes an effective sheltered lesson as problematic concerns for educators.

ELLs have unique educational and English language needs. Echevarria et al. (2008) note many students enter our schools with different levels of English proficiency and schooling experiences. Some immigrant students have extensive formal education and others are from rural areas where educational opportunities are limited. Many ELLs have gaps in their native language education. Challenged by the rapid growth in the ELL population, their varied educational needs, and different English language proficiency level, many schools have begun to use a sheltered instruction approach to teach their ELLs the core academic content areas of English, math, science, and social studies. In order for public schools to comply with the No Child Left Behind (NCLB) legislation requirements, ELLs must demonstrate annual yearly progress and meet the rigorous state academic standards for graduation if they are to succeed.

Citing Genesee (1999), researchers Echevarria et al. (2008) note that sheltered instruction plays a major role in a variety of educational program designs. Sheltered instruction, they state, may be part of an ESL program, a late-exit bilingual program, a two-way bilingual immersion program, a newcomer program, or a foreign language immersion program. Citing research by August and Hakuta (1997), Berman, McLaughlin, Minicucci, Nelson, and Woodworth (1995); Kauffman, Burkhart, Crandall, Johnson, Peyton, Sheppard, and Short (1994); Sheppard (1995); and Echevarria et al. (2008) noted research has shown that great variability exists in the design and delivery of sheltered instruction lessons among trained teachers and within the same schools.
Echevarria et al. (2008) state:

In retrospect, this lack of consistency across SI classes is somewhat predictable. Sheltered curricula for different areas were few in number and varied widely from school district to school district…There was no model to follow. Teachers were encouraged to pick and choose techniques they enjoyed or believed work best with their students, and very few teachers were specifically prepared to be SI teachers through undergraduate or graduate work. Few systematic and sustained forms of professional development were available for SI teachers. (pp. 14, 15)

The SIOP model, they state, was designed to provide effective instruction that would meet the academic needs of ELLs.

As mentioned, the SIOP model is the result of a 7-year project conducted from 1996 to 2003 by researchers Jana Echevarria and Deborah J. Short. The study was conducted for the Center for Research on Education, Diversity, and Excellence (CREDE) and funded by the U.S. Department of Education. Participants in this study were middle school teachers from four large school districts located in different regions of the U.S. The purpose of the study was to create a professional development model based on key sheltered instruction practices that would allow more teachers to use the sheltered instruction approach in their classrooms (Echevarria et al., 2008). The SIOP model can be applied in ESL and content area classrooms. It allows teachers to give careful attention to the distinct second language development needs of their ELLs and to adjust and modify the level of English academic language until their students grasp the concept being taught. The SIOP model consists of eight essential components or protocols that help teachers provide grade-level material to ELLs of differing levels of English language proficiency. According to the research findings ELLs’ academic skills improved when teachers implemented all eight components of the model.
The eight components of the SIOP model are: (1) Preparation, (2) Building background, (3) Comprehensible input, (4) Strategies, (5) Interaction, (6) Practice and Application, (7) Lesson delivery, and (8) Review and Assessment. Echevarria et al. (2008) state:

The theoretical underpinning for the model is that language acquisition is enhanced through meaningful use and interaction. Through the study of content, students interact in English with meaningful content material that is relevant to their schooling. Because language processes, such as listening, speaking, reading, and writing develop interdependently...SIOP lessons incorporate activities that integrate those skills. (pp. 16, 17)

Thus, teachers are able to provide both language and content that is appropriate for their ELLs’ English proficiency levels. Krashen (1985) notes that in immersion or sheltered classrooms, students are provided the comprehensible input and subject matter material they require. Krashen goes on to say, “Immersion style comprehensible subject-matter teaching (termed sheltered classes) may turn out to be an important supplement to second-language programs” (p.17). He notes that sheltered classes serve as a bridge to the mainstream classroom. To bridge the English language and educational gaps of ELLs the SIOP model incorporates effective instructional methods such as scaffolding, literacy techniques, learning strategies, and teacher feedback that help ELLs gain the curriculum content and academic language required for success (Echevarria et al., 2008). They also note that the SIOP model can be applied to both ESL and content area classes because it is a framework for instruction that incorporates current best practices for teaching both language and content.

Providing the necessary subject matter content and language are central issues addressed by each of the eight components of the model. As teachers plan lessons using the SIOP model they include specific content and language objectives. The
researchers note that effective content objectives are given orally and in writing, two important language domains. The researchers posit that the content objectives should identify what the student should know and be able to do. Content objectives must guide both the teaching and learning processes. Teachers should plan their language objectives for ELLs by providing multiple opportunities for reading, listening, speaking, and writing in the target language. Key factors to consider when planning lessons, the researchers say, are the students’ home language (L1), literacy level, the second language proficiency (L2), their reading ability, cultural and age appropriateness of the (L2) materials, and difficulty level of the materials. (p. 23) Providing supplemental materials for ELLs, they stress, will help to support the dense academic content materials. Echevarria et al. (2008) state, “This is especially important for students who do not have grade-level academic backgrounds and/or who have language and learning difficulties” (p. 24). Supplemental materials provide scaffold support by adapting the often dense and difficult text of content material. The researchers found that effective instruction using the SIOP model includes eight key components:

1. The Preparation component includes lesson objectives for both content and ELL students’ language needs and supplemental materials to support ELL comprehension by scaffolding content, which is often dense and difficult text.

2. The Building background component is accomplished by linking students’ prior experiences to the lesson objectives resulting in greater understanding of the lesson. Preteaching vocabulary found in the text aided by visual materials help provide multiple exposures to key terms and concepts.

3. The Comprehensible input component requires teachers to modify their speech to the varied English proficiency levels of the students. Effective techniques include use of modeling, gestures, visual aids, and hands-on activities communicated via the four language domains of speaking, reading, listening, and writing.
4. The Strategies component should promote critical thinking skills using metacognitive, cognitive, social, and affective strategies that promote self-monitoring, self-regulating, and problem solving. Teacher expectations should reflect requirements set by the standards for academic success.

5. The Interaction component calls for teachers to plan multiple opportunities for students to practice using the subject matter and language in a variety of student groupings to enhance learning experiences.

6. The Practice and Application component stresses the need for variety in the activities used for practicing. These may include hands-on and manipulative activities that help to connect abstract concepts to concrete concepts. Practice should include mixed groupings in which each student is expected to demonstrate his/her new learning.

7. The Lesson delivery component emphasizes the need for teachers to plan lessons well and to stay on task so that students understand the learning expectations. Teachers should incorporate a variety of strategies that actively engage students throughout the lesson cycle.

8. The Review and Assessment component expresses the need for teachers to use both formal and informal assessments to continually monitor the ELLs’ learning. Effective sheltered instruction teachers use a variety of measures to assess key vocabulary and content concepts to provide supportive feedback to students.

Finally, in addition to these key components the developers of the SIOP model recommend that teachers consider the varied learning differences and proficiency levels of the ELLs themselves when planning their lessons. Teachers should consider students’ differences when planning, delivering and assessing student performance. Teachers should focus the students’ attention on the objectives of the lesson and minimize distractions in the classroom environment. Teachers should use repetition to aid students in recalling key academic terms and how the terms are used in the lesson. Teachers should also allow extra wait time when asking ELLs questions and should accept short answers when they are appropriate to the students’ English proficiency level. These important considerations will allow students to participate actively in class
discussions and improve their learning experiences.

The theories of second language acquisition mentioned in the review of literature indicated the need for comprehensible English language input (Krashen, 1982) and academic language instruction (Cummins, 1984) for ELLs to achieve academic success. Previous sheltered instruction approaches have used a variety of ESL strategies but have lacked a structure to address ELLs’ language and academic achievement needs consistently. The SIOP model was developed to train content area teachers in the theories and the best practices for ELLs, and to provide a flexible structure allowing teachers to create appropriate lesson plans, practice activities and assessments for students of varying English language proficiency levels.

Summary

This chapter presented a review of the current literature relating to second language acquisition and its implications for the instruction of ELLs. The theories of second language acquisition posited by (Krashen, 1982; Cummins, 1984; Thomas & Collier, 1997) can impact educational practices related to ELLs’ English language proficiency development and academic performance. The SIOP program model developed by Echevarria et al. (2008) incorporates hypotheses posited in each of these theories of second language acquisition such as the need for comprehensible English language input (Krashen, 1982) and grade-level academic content (Cummins, 1984), along with teaching strategies and skills proven in their research studies to be effective for teaching ELLs both language and content.
CHAPTER 3

METHODOLOGY

This chapter describes the methodology that was used for this study. The context of the study, the setting, subjects, and the time frame are detailed. The research questions, instrumentation, and methods of analysis used to answer the research questions follow. The purpose of this study was to determine the current status of secondary teachers’ implementation of the sheltered instruction operational protocol (SIOP) model and its effect on Hispanic English language learners’ English language proficiency and academic achievement. This study sought to determine whether teachers perceive the SIOP model as an effective tool for planning instruction to increase content material acquisition and English language comprehension for ELLs.

Research Questions

In this study the following research questions were addressed:

1. What is the effect of sheltered instruction operational protocol (SIOP)-based instruction on secondary Hispanic English language learners’ (ELLs’) English language proficiency as measured by the Texas English Language Proficiency Assessment System (TELPAS)?

2. What is the effect of sheltered instruction operational protocol (SIOP)-based instruction on secondary Hispanic English language learners’ (ELLs’) English language arts achievement as measured by the Texas Assessment of Knowledge and Skills (TAKS)?

3. What is the current status of secondary teachers’ quality of sheltered instruction operational protocol (SIOP) instruction and degree of implementation as measured at four points during the school year?

4. What is the current status of secondary sheltered instruction operational protocol (SIOP) teachers’ perceptions of the SIOP model, their own success in SIOP implementation, and their students’ achievement under the SIOP model?
Setting

In this study, the subjects were three high school English Language Arts teachers who were selected based on their professional development training in the SIOP program model. All three taught Hispanic ELLs in Grades 9-12 at a public high school in a north central Texas independent school district.

At the time of this study, the city in which the high school is located had an estimated population of 100,000 people and the district in which the high school is located had a total population of approximately 15,000 elementary and secondary students. The district had 27 elementary and secondary campuses consisting of 3 high schools, 4 junior high schools, and 20 elementary schools.

According to the 2006 Texas Education Agency’s Academic Excellence Indicator System (AEIS) report from the TEA, the ethnic distribution of the student population in the district was: African American 2,687 (17.9%), Hispanic 3,577 (23.9%), Caucasian 8,230 (54.9%), Native American 133 (0.9%) and Asian/Pacific Islander 359 (2.4%). At the time of the study, the district had approximately 672 elementary ELLs and 90 secondary ELLs, mostly from Hispanic backgrounds. The district had 6,270 students (41.8 %) who were at risk. The district had approximately 1,080 classroom teachers.

According to district administrators, at the time of the study, there were approximately 35 elementary and 20 secondary teachers who had received training in the SIOP model. In this district, elementary ELLs are placed in a transitional bilingual setting, and high school ELLs have one English as a second language (ESL) class period daily. The only sheltered English/language arts classes available are at the high school campus that participated in this study.
The high school in this study had a population of 1,512 students whose ethnic distribution was: African American 235 (15.5%), Hispanic 531 (35.1%), Caucasian 701 (46.4%), Native American 7 (0.5%), and Asian/Pacific Islander 38 (2.5%). The economically disadvantaged students were: African American 127 (16.1%), Hispanic 288 (36.3%), White 357 (46.8%), Native American, and Asian/Pacific Islander combined 19 (2.4%). The high school ELL population had an enrollment of 77 students divided among Beginning 15 (20.0%); Intermediate 54 (70.0%); and Advanced 8 (10.0%).

Research Participants

The high school teachers selected to participate in this study had each received professional development training in the SIOP model. The teachers were recommended by the high school principal and agreed to participate in this study. Participating teachers used the SIOP model when instructing their Hispanic ELLs. The three participating high school teachers were secondary English/language arts teachers, and they received the SIOP model professional development training in summer 2006.

Teachers

Teacher A was a white female who was state certified in secondary English/language arts and had been teaching high school level English for five years. Teacher A had been trained in the SIOP model one year prior to this study.

Teacher B was a white female who was state certified in secondary English/language arts and had been teaching high school level English for 20 years. Teacher B had also been trained in the SIOP model one year prior to this study.
Teacher C was a white female who was state certified in secondary English language arts and had been teaching high school level English for 18 years. Teacher C had also been trained in the SIOP model one year prior to this study. The three teachers received SIOP model training together in the summer 2006. Teacher characteristics are listed below in Table 1.

Table 1

*Teacher Characteristics*

<table>
<thead>
<tr>
<th>Content area</th>
<th>Ethnicity</th>
<th>Gender</th>
<th># Yrs teaching</th>
<th>SIOP Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher A English</td>
<td>W</td>
<td>F</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Teacher B English</td>
<td>W</td>
<td>F</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>Teacher C English</td>
<td>W</td>
<td>F</td>
<td>18</td>
<td>1</td>
</tr>
</tbody>
</table>

*Students*

The high school in this study had 77 ELLs enrolled, who comprised 0.05% of the total student population. Only the scores for Hispanic students whose teachers participated in this study (i.e., Teachers A, B, C) were employed. Teacher A taught both Grade 9 and Grade 10. In Grade 9 there were two intermediate, two advanced, and one advanced high English level students. Grade 10 had three intermediate English level students and three advanced English level students. Teacher B taught Grade 11, with one intermediate English level student, 10 advanced English level students, and one advanced high level student. Teacher C taught Grade 12, with one intermediate English
level and four advanced English level students. Students were selected based on their participation in sheltered English/language arts classes and were Hispanic ELLs at the high school participating in this study. See Table 2 for student characteristics.

### Table 2

*Student Characteristics*

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Grade Level</th>
<th>Language Proficiency Level</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher A</td>
<td>9</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Teacher B</td>
<td>11</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Teacher C</td>
<td>12</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>7</td>
<td>19</td>
</tr>
</tbody>
</table>

Permission to conduct this study was obtained from the University of North Texas Institutional Review Board (Appendix A), the participating teachers, the high school principal, and the participating school district's superintendent.

**Instrumentation**

In this study, permission was requested in writing; after obtaining permission the teacher observations were conducted using the SIOP (Appendix B), developed and tested by Echevarria and Short (1999). These researchers developed the rating scale protocol to measure how well classroom teachers implement sheltered instruction strategies in their daily lesson planning. Echevarria and Short call it the Sheltered
Instruction Operational Protocol (SIOP) The SIOP Instrument is an effective teacher observation tool that measures the degree of implementation a teacher has attained in his/her application of the SIOP instructional model. Data from the SIOP have been tested and found to be valid and reliable. Statistical analysis revealed an interrater of correlation 0.99. The SIOP systematically documents the degree of implementation of sheltered instruction strategies and the fidelity of a teacher's implementation. The SIOP is made up of 30 items that are grouped under three main headings: (1) Preparation, (2) Instruction, and (3) Review and Assessment. Each of the items is scored individually using a five-point Likert scale, with the scores ranging from 0-4. Additionally, an optional N/A score is available if an item is not applicable to the lesson. The protocol also provides a comments section for qualitative data so that observers may record the presence or absence of a particular item in the lesson observed.

In addition, for the current study I used oral interviews with open-ended questions that revealed the teachers’ perceptions of the effectiveness of the SIOP model of instruction for ELLs. Teachers commented on their perceptions of the SIOP model, their own perceived success in SIOP implementation, and their students’ achievement under the SIOP model.

The Texas English Language Proficiency Assessment System Proficiency Assessment System (TELPAS) and the Texas Academic Knowledge and Skills (TAKS) are standardized tests administered annually in all Texas public schools. The study used the TELPAS to determine the English language proficiency of Hispanic ELLs. In Texas, the TELPAS is used as part of the No Child Left Behind (NCLB) accountability system to report ELLs’ annual yearly progress. The stated goal is for all ELLs to make
at least one proficiency level of progress each year. ELLs’ English language proficiency levels are assessed in the four language domains consisting of listening, speaking, reading, and writing. This study also used the TAKS to determine the effect of participation in SIOP-based instruction on secondary Hispanic ELLs in the content area of English/language arts achievement.

Procedures

Three high school English/language arts teachers were chosen to participate, based on their professional development training in sheltered instruction and their implementation of the SIOP model for instructing their ELLs. This study employed both qualitative and quantitative methodologies. Data were collected from four sources: teacher observations, Hispanic ELLs’ English language proficiency scores and academic achievement scores, and an oral interview with participating teachers. The qualitative data were collected using a time-series design in which the data were collected throughout the duration of the study. The quantitative data on student achievement were collected employing a pre-experimental, one-group pretest-post-test design. Observations were conducted at four points during the school year with the SIOP instrument. Each teacher was observed on four occasions.

The teacher observations were conducted by the high school’s state-certified ESL teacher, who was also certified in the SIOP model. Prior to the beginning of the study, the researcher reviewed the procedures for scoring the SIOP with the observer. Observations of the teachers during instruction were recorded using the SIOP. Each observation required approximately one hour for observing and recording the 30 items of the SIOP. After each teacher had been observed, the score was recorded for each of
the items observed during the lesson, and the instrument was returned to the investigator.

At the conclusion of the study, teachers provided the investigator with the TELPAS and TAKS scores for each Hispanic ELL as documentation of these students’ English language proficiency and English/language arts content achievement. The scores were coded by the teachers to protect student anonymity (i.e. Teacher A: score A1, A2, A3, etc.).

Data Analysis

This study employed both quantitative and qualitative methods to analyze the four sources of data. Research Questions 1 and 2 were analyzed separately with inferential statistics. A t-test for non-independent samples was performed at a probability level of 0.05 to compare pretest and post-test means for the one student group. To explore differences between groups/classes, an analysis of variance (ANOVA) was performed using an alpha level of 0.05 on the 2007 and 2008 TELPAS and TAKS pretests and post-tests to compare the student performances of Teachers A, B, and C. The independent variable was defined as the teachers’ SIOP-based instruction, and the dependent variables were defined as students’ English language proficiency as measured by the TELPAS scores and English/language arts academic achievement measured by the TAKS scores.

Research Questions 3 and 4 were analyzed with descriptive statistics and more qualitative techniques. Specifically, Research Question 3 was answered using descriptive information from teacher observations measured by the SIOP. The SIOP consists of a five point Likert scale that ranges from 0 to 4. Each of the 30 items
measured are grouped into one of the eight components scored by the SIOP. Therefore, in each of the four observations, when applying the SIOP as the measure, the highest possible score would be 120 (i.e. 30x4 = 120). The scores are reported as individual item score totals and individual component score totals for each of the four observations of Teacher A, B and C. Additionally, scores are reported as overall percentage scores for Teacher A, B and C’s levels of SIOP model implementation of the sheltered instruction lessons for ELL. Teachers’ SIOP implementation scores from the observations and Hispanic ELLs’ English language proficiency and English/language arts content achievement scores were reviewed to determine the effect of teachers implementation of the SIOP model on Hispanic ELLs’ English language proficiency and English/language arts content achievement.

Research Question 4 was answered by an oral interview with teachers using open-ended questions. Similarities and differences in their opinions were noted. The goal of the oral interview was to provide a source for deeper insight into teachers’ perceptions of the SIOP model, their success with the model and their perceptions of its effects on ELLs’ achievement. The researcher assumed that teachers would perceive the SIOP model to be an effective tool for instructing ELLs.

Summary

This chapter has noted the methods that were used to measure the research questions of this study. The next chapter presents a description of the results of the data collected from the teacher observation and oral interviews, and Hispanic ELLs’ English language development and academic achievement scores.
CHAPTER 4

PRESENTATION OF RESULTS

As stated in Chapter 1, this study examined secondary teachers’ implementation of the sheltered instruction operational protocol (SIOP) model and its effect on Hispanic English language learners’ English language proficiency and academic achievement. While looking at the overall effect of the program, individual teachers’ perceptions of the SIOP model as an effective tool were also examined in the areas of instructional planning, instructional content, and English language proficiency.

The quantitative data from this study were analyzed with SPSS™ 15.0 (www.SPSS.com) statistical software. In addition to the quantitative data, teacher interviews were conducted and analyzed and are presented as qualitative data in this chapter.

This chapter provides an overview of data collection, participant demographics, and results of the study. Descriptive and inferential statistics provide an analysis of pretest and post-test data regarding the effect of the SIOP model on Hispanic ELLs’ English language proficiency and academic achievement. The results are organized by the research questions guiding this study.

Research Questions

The following research questions guided this study:

1. What is the effect of sheltered instruction operational protocol (SIOP)-based instruction on secondary Hispanic English language learners’ (ELLs’) English language proficiency as measured by the Texas English Language Proficiency Assessment System (TELPAS)?
2. What is the effect of sheltered instruction operational protocol (SIOP) - based instruction on secondary Hispanic English language learners’ (ELLs’) English language arts achievement as measured by Texas Assessment of Knowledge and Skills (TAKS)?

3. What is the current status of secondary teachers’ quality of sheltered instruction operational protocol (SIOP) instruction and degree of implementation as measured at four points during the school year?

4. What is the current status of secondary sheltered instruction operational protocol (SIOP) teachers’ perceptions of the SIOP model, their own success in SIOP implementation, and their students’ achievement under the SIOP model?

Data Analysis

This study employs both quantitative and qualitative methods to analyze the four data sources. Research Questions 1 and 2 were analyzed separately with inferential statistics. A paired samples $t$-test was run to compare pretest and post-test means for the single sample of student scores. To explore differences between groups/classes, an analysis of variance (ANOVA) was performed using an alpha level of 0.05 on the 2007 and 2008 TELPAS and TAKS pretests and post-tests to compare the student performances of Teachers A, B, and C.

The independent variable was defined as the teachers’ SIOP-based instruction, and the dependent variables were defined as students’ English language proficiency as measured by the TELPAS scores and English/language arts academic achievement as measured by the TAKS scores. The TELPAS and the TAKS are standardized tests administered to students annually in all Texas public schools.

Data related to Research Questions 3 and 4 were analyzed with descriptive statistics and quantitative techniques. Research Question 3 was answered using the SIOP to provide descriptive information from teacher observations. The SIOP employs a
five-point Likert scale that ranges from 0 to 4. Each of the 30 items measured are grouped into one of the eight components scored by the SIOP. Therefore, in each of the four observations, when applying the SIOP as the measure, the highest possible score would be 120 (i.e. 30x4 = 120). The scores are reported as individual item score totals and individual component score totals for each of the four observations completed for each subject -- Teacher A, B, and C. Additionally, scores are reported as overall percentage scores for each subject -- Teacher A, B, and C. These percentage scores reflect levels of SIOP model implementation of the sheltered instruction lessons for English language learners (ELL). Research Question 4 was answered through an oral interview with teachers using open-ended questions.

**Presentation of Results**

This study employed both quantitative and qualitative methods to analyze the four data sources: Hispanic ELLs' TELPAS scores, Hispanic ELLs' TAKS English/language arts scores, teacher observations, and teacher interviews.

With regard to Research Question 1 concerning student achievement data on the TELPAS English language proficiency assessment, the data consisted of 24 paired scores for those who completed both the 2007 and 2008 TELPAS. The 2007/2008 TELPAS assessment results for these students were used as the pretest/post-test scores. The TELPAS assessment for English language proficiency is scored on a scale ranging from a minimum possible score of 1.0 to a maximum possible score of 4.0.

The student achievement scores on the TELPAS test were analyzed using a paired samples $t$-test at an alpha level of 0.05. This test allowed for the comparison of
pretest and post-test means to determine whether the SIOP model of sheltered instruction resulted in increased scores. The null hypothesis was that there would be no significant difference between the means of the students at pretest when compared to post-test. The data were analyzed with SPSS™ 15.0 (www.SPSS.com).

The results of the paired samples t-test indicate that there was a statistically significant difference between the 2007 and 2008 means ($t(23) = 4.052, p < .05, d = .50$) on the TELPAS English language proficiency test with the means scores of these students increasing from 2007 to 2008. An effect size of .50 is considered a moderate effect size, indicating meaningful improvement across time (pretest/post-test). The 2007 TELPAS students’ scores ranged from 1.8 to 3.8 and the 2008 TELPAS students’ scores ranged from 2.1 to 4.0. The mean score of the 2007 TELPAS pretest was 2.825 ($SD = 0.512$), and the mean score of the 2008 TELPAS post-test was 3.267 ($SD = 0.618$). These findings suggest that the teachers’ implementation of the SIOP model in their sheltered lessons did result in improved English language proficiency scores on the TELPAS exam. The descriptive statistics are shown in Tables 3-8.

Table 3

**TELPAS Descriptive Statistics**

<table>
<thead>
<tr>
<th>TAKS</th>
<th>$N$</th>
<th>Low score</th>
<th>High score</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>24</td>
<td>1.8</td>
<td>3.8</td>
<td>2.825</td>
<td>0.512</td>
</tr>
<tr>
<td>Post-test</td>
<td>24</td>
<td>2.1</td>
<td>4.0</td>
<td>3.267</td>
<td>0.618</td>
</tr>
</tbody>
</table>
Table 4

**TELPAS 2007/2008 Paired Samples t-Test**

<table>
<thead>
<tr>
<th></th>
<th>Upper</th>
<th>Lower</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest/Post-test</td>
<td>-0.66715</td>
<td>-0.21618</td>
<td>-4.052</td>
<td>23</td>
<td>&lt;.005</td>
</tr>
</tbody>
</table>

Table 5

*Means and Standard Deviations for Teachers A, B, C, on the TELPAS from 2007 to 2008*

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Pretest Mean</th>
<th>SD</th>
<th>Post-test Mean</th>
<th>SD</th>
<th>Mean Diff. Pre/Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher A</td>
<td>7</td>
<td>2.360</td>
<td>.519</td>
<td>2.790</td>
<td>.662</td>
<td>.430</td>
</tr>
<tr>
<td>Teacher B</td>
<td>12</td>
<td>3.070</td>
<td>.110</td>
<td>3.470</td>
<td>.517</td>
<td>.400</td>
</tr>
<tr>
<td>Teacher C</td>
<td>5</td>
<td>2.900</td>
<td>.164</td>
<td>3.440</td>
<td>.483</td>
<td>.540</td>
</tr>
</tbody>
</table>

Table 6

*Mean of Gain Scores from 2007 to 2008 for the TELPAS*

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Mean of Gain Scores</th>
<th>SD of Gain Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher A</td>
<td>7</td>
<td>.429</td>
<td>.588</td>
</tr>
<tr>
<td>Teacher B</td>
<td>12</td>
<td>.408</td>
<td>.602</td>
</tr>
<tr>
<td>Teacher C</td>
<td>5</td>
<td>.540</td>
<td>.329</td>
</tr>
</tbody>
</table>
Table 7

Mean of Gain Scores from 2007 to 2008 across all Teacher Classes for the TELPAS

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean of Gain Scores</th>
<th>SD of Gain Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>TELPAS 2007/2008</td>
<td>24</td>
<td>.442</td>
<td>.534</td>
</tr>
</tbody>
</table>

Table 8

Teachers A, B, C: TELPAS 2007 versus 2008 Student Achievement Scores t-Test across all Classes

<table>
<thead>
<tr>
<th></th>
<th>t (2 tailed)</th>
<th>df</th>
<th>p</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>TELPAS 2007/2008</td>
<td>4.052*</td>
<td>23</td>
<td>.000</td>
<td>.793</td>
</tr>
</tbody>
</table>

*Significance at p < .05

Because there were differences between the 2007 and 2008 TELPAS scores, a one-way ANOVA was performed to examine where the differences may lie. The ANOVA analysis assumes that the variance within the teacher classes is homogenous. To test for this assumption, a Levene’s Homogeneity test was performed for both the 2007 and 2008 TELPAS scores. Levene’s test for both the 2007 and 2008 TELPAS scores indicated that variances were equal and suitable for further analysis. This assumption was met, and an ANOVA was run for both 2007 and 2008 scores to explore differences between the three classrooms, each with a different teacher.
In the ANOVA of the 2007 TELPAS scores, a statistically significant difference was found between teacher classes \( (F(2.21) = 6.308, p = .007, d = .375) \). The results of the post hoc test indicate that Teacher A’s class was found to be statistically different from Teacher B’s and Teacher C’s classes. These class differences are shown in the ANOVA descriptive Tables 9-11.

Table 9

2007 TELPAS Scores Test of Homogeneity of Variances

<table>
<thead>
<tr>
<th>Levene Statistic</th>
<th>df1</th>
<th>df2</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.037</td>
<td>2</td>
<td>21</td>
<td>.155</td>
</tr>
</tbody>
</table>

Table 10

2007 TELPAS Scores ANOVA

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>n²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>2.261</td>
<td>2</td>
<td>1.131</td>
<td>6.308</td>
<td>.007</td>
<td>.375</td>
</tr>
<tr>
<td>Within Groups</td>
<td>3.764</td>
<td>21</td>
<td>.179</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6.025</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ANOVA of the 2008 TELPAS scores was performed. Homogeneity of variance was tested prior to conducting the analysis and indicated that the variances between the three classrooms was not statistically significant and were suitable for further analysis. Results indicate statistical difference within these teacher classes ($F(2.21) = 3.698, p = .042, d = .260$). In the ANOVA of the 2008 TELPAS scores, the results of the post hoc test indicated that Teacher A’s class was statistically different from Teacher B’s class. The mean differences between our 2007 and 2008 TELPAS scores indicate scores are increasing pretest/post-test. Additionally, Teacher C’s class was not statistically different from Teacher A’s or Teacher B’s classes. These class differences are shown in the ANOVA descriptive Tables 12-14.
Table 12

2008 *TELPAS* Scores *Test of Homogeneity of Variances*

<table>
<thead>
<tr>
<th>Levene Statistic</th>
<th>df1</th>
<th>df2</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>.405</td>
<td>2</td>
<td>21</td>
<td>.672</td>
</tr>
</tbody>
</table>

Table 13

2008 *TELPAS* Scores *ANOVA*

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>(\eta^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>2.290</td>
<td>2</td>
<td>1.145</td>
<td>3.698</td>
<td>.042</td>
<td>.260</td>
</tr>
<tr>
<td>Within Groups</td>
<td>6.503</td>
<td>21</td>
<td>.310</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>8.793</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 14

2008 *TELPAS* Scores *TUKEY HSD*

<table>
<thead>
<tr>
<th>Teacher</th>
<th>n</th>
<th>Subset for alpha = .05</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Teacher A</td>
<td>7</td>
<td>2.786</td>
</tr>
<tr>
<td>Teacher B</td>
<td>5</td>
<td>3.440</td>
</tr>
<tr>
<td>Teacher C</td>
<td>12</td>
<td>3.475</td>
</tr>
<tr>
<td>Significance</td>
<td></td>
<td>.074</td>
</tr>
</tbody>
</table>
In summary, the TELPAS ANOVA did find statistically significant differences between the teacher classes (Teacher A, Teacher B, and Teacher C) in both 2007 and 2008 in the TELPAS scores. Teacher C’s class reported the largest mean difference increase at 0.5400, while Teacher B’s class had the smallest mean difference increase at 0.4083. Teacher A’s class reported a mean difference of 0.4286. The total mean difference increase for the three teacher’s classes on the 2007/2008 TELPAS pretest/post-test scores was .4417. These class differences are shown in Table 15.

Table 15

<table>
<thead>
<tr>
<th>Teacher</th>
<th>2007 TELPAS</th>
<th>2008 TELPAS</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>A</td>
<td>7</td>
<td>2.357</td>
<td>.592</td>
</tr>
<tr>
<td>B</td>
<td>12</td>
<td>3.067</td>
<td>.382</td>
</tr>
<tr>
<td>C</td>
<td>5</td>
<td>2.900</td>
<td>.367</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td>2.830</td>
<td>.512</td>
</tr>
</tbody>
</table>

Research Question 2 involved a sample of seventeen students who completed both the 2007 and 2008 TAKS. The 2007 TAKS English/Language Arts exam results for these students were used as the pretest scores. The scores on the TAKS English/Language Arts exam ranged from 1738 to 2140 out of a total possible score of 2600. The mean score was 2006.647 (SD= 101.379). The 2008 TAKS English/Language Arts exam results for the same seventeen students were used for the
pretest scores. Students’ pretest scores ranged from 1932 to 2237. The pretest had a mean score of 2038.059 (SD= 86.346). The descriptive statistics are shown below in Table 16-17.

Table 16

2007/2008 TAKS Pretest/Post-test Mean Differences

<table>
<thead>
<tr>
<th>Teacher</th>
<th>N</th>
<th>2007 TAKS</th>
<th>2008 TAKS</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5</td>
<td>1964.400</td>
<td>2027.600</td>
<td>63.200</td>
</tr>
<tr>
<td>B</td>
<td>8</td>
<td>2015.750</td>
<td>2057.125</td>
<td>41.375</td>
</tr>
<tr>
<td>C</td>
<td>4</td>
<td>2041.250</td>
<td>2013.000</td>
<td>-28.250</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
<td>2003.647</td>
<td>2038.059</td>
<td>31.412</td>
</tr>
</tbody>
</table>

Table 17

English TAKS Descriptive Statistics

<table>
<thead>
<tr>
<th>TAKS</th>
<th>N</th>
<th>Low Score</th>
<th>High Score</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>17</td>
<td>1738</td>
<td>2140</td>
<td>2006.647</td>
<td>101.379</td>
</tr>
<tr>
<td>Post-test</td>
<td>17</td>
<td>1932</td>
<td>2237</td>
<td>2038.059</td>
<td>86.34</td>
</tr>
</tbody>
</table>

Student achievement scores on the English/Language Arts TAKS were analyzed using a paired samples t-test at a probability level of 0.05 to compare 2007 and 2008 means. The data were analyzed with SPSS™ (www.SPSS.com) 15.0. The mean score of the TAKS pretest was 2006.647 (SD= 101.379), and the mean score of the TAKS
The post-test was 2038.059 (SD= 86.346) out of a maximum score of 2600. The results of the paired samples \( t \)-test analysis indicate that there was no statistically significant difference between the 2007 and 2008 scores, as seen in Table 18 and 19.

Table 18

*English TAKS Paired Samples Descriptive Statistics*

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>2006.647</td>
<td>17</td>
<td>101.379</td>
<td>24.588</td>
</tr>
<tr>
<td>Post-test</td>
<td>2038.059</td>
<td>17</td>
<td>86.346</td>
<td>20.942</td>
</tr>
</tbody>
</table>

Table 19

*English TAKS Paired Samples \( t \)-test*

<table>
<thead>
<tr>
<th></th>
<th>95% Confidence Interval</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Upper</td>
<td>Lower</td>
<td>( t )</td>
<td>( df )</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>Pretest &amp; Post-test</td>
<td>68.641</td>
<td>5.817</td>
<td>-1.789</td>
<td>16</td>
<td>0.093</td>
</tr>
</tbody>
</table>

With regard to the homogeneity of variance, the assumption was met for the 2008 TAKS scores. However, on the 2007 TAKS scores, the assumption was not met. Since the assumption was not met on the 2007 TAKS data, it was determined that given the class differences and the small data sample, interpretation using data transformation would not be particularly meaningful. The class differences are shown in the ANOVA descriptive in Tables 20-23.
Table 20

2007 TAKS Scores Test of Homogeneity of Variances

<table>
<thead>
<tr>
<th>Levene Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.956</td>
<td>2</td>
<td>14</td>
<td>.043</td>
</tr>
</tbody>
</table>

Table 21

2007 TAKS Scores ANOVA

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>14376.432</td>
<td>2</td>
<td>7188.216</td>
<td>.671</td>
<td>.527</td>
<td>.087</td>
</tr>
<tr>
<td>Within Groups</td>
<td>150065.450</td>
<td>14</td>
<td>10718.961</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>164441.882</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 22

2008 TAKS Scores Test of Homogeneity of Variances

<table>
<thead>
<tr>
<th>Levene Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.426</td>
<td>2</td>
<td>14</td>
<td>.273</td>
</tr>
</tbody>
</table>
Within the class comparison of the pretest/post-test TAKS scores, the ANOVA indicates that Teacher A’s class showed the largest mean increase with a 63.20, and Teacher B’s class had a mean increase of 41.37. On the other hand, Teacher C’s class had a decrease of -28.25. Teachers A and B’s classes showed positive changes from 2007-2008 year to year, while teacher C’s class showed a negative change.

As previously reported in the ANOVA summaries of the 2007/2008 TELPAS scores, the finding was that there were statistical differences between the three classrooms. However, in the finding of the 2007/2008 TAKS scores, there were no statistically significant differences between the teacher classes to report.

In summary, a review of the t-test findings from 2007/2008 TELPAS and 2007/2008 TAKS indicate a statistically significant difference between the testing periods (t (23) = -4.052, p < .05) on the TELPAS pretest/post-test. The results of the 2007 and 2008 TAKS scores on the paired samples t-test analysis indicate that there was no statistically significant difference, but there was a year to year mean score increase of 32 points. Additionally, class differences were found within 2007 and 2008 TELPAS scores. Interestingly, there was a decreased mean difference for Teacher C.
between 2007 and 2008 TAKS scores. Although this did not reduce the overall mean increase from year to year, this finding was not expected.

Data for Research Question 3 were gathered via observations of the three participant teachers during ELL instruction in their sheltered classes. The measurement tool was the SIOP developed by researchers Echevarria, Vogt, and Short (2008) to rate teachers’ sheltered lessons. Teachers were observed instructing their ELLs at four points during the school year.

The SIOP is measured on a five-point Likert scale that ranges from 0 to 4. The eight components of the SIOP model are reflected in the 30 items that can be scored by the instrument. The highest possible score on the SIOP is 120 (i.e. 30x4 =120). Teachers’ implementation of SIOP was measured at four periods during this study. The degree of SIOP model implementation across the four observation periods for Teachers A, B, and C is reported as individual item total scores as well as total scores for each of the eight components measured by the SIOP. Table 25 shows the total percentage score on the SIOP for each teacher. The descriptive data are shown in Tables 24 and 25 below.
Table 24

*Individual Item Total Scores (30 items) and Component Total Scores for the Four Teacher Observations*

<table>
<thead>
<tr>
<th>Teacher</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Preparation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Content Objectives</td>
<td>5</td>
<td>8</td>
<td>16</td>
<td>13</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>2. Language Objectives</td>
<td>4</td>
<td>3</td>
<td>14</td>
<td>9</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>3. Content Concepts</td>
<td>13</td>
<td>12</td>
<td>16</td>
<td>15</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>4. Supplementary Materials</td>
<td>8</td>
<td>8</td>
<td>11</td>
<td>11</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>5. Adaptation of Content</td>
<td>12</td>
<td>11</td>
<td>14</td>
<td>12</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>6. Meaningful Activities</td>
<td>11</td>
<td>10</td>
<td>12</td>
<td>11</td>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>52</td>
<td>83</td>
<td>34</td>
<td>30</td>
<td>37</td>
</tr>
<tr>
<td>II. Instruction Background</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Concepts Explicitly Linked</td>
<td>12</td>
<td>7</td>
<td>12</td>
<td>11</td>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td>8. Links Explicitly Made</td>
<td>10</td>
<td>9</td>
<td>11</td>
<td>12</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td>25</td>
<td>37</td>
<td>32</td>
<td>25</td>
<td>37</td>
</tr>
<tr>
<td>Comprehensible Input</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Speech</td>
<td>14</td>
<td>14</td>
<td>15</td>
<td>14</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>11. Explanation of Academic task clear</td>
<td>10</td>
<td>11</td>
<td>13</td>
<td>12</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>28</td>
<td>38</td>
<td>30</td>
<td>28</td>
<td>38</td>
</tr>
<tr>
<td>III. Review/Evaluation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Variety of technique used to clarify concepts</td>
<td>11</td>
<td>9</td>
<td>11</td>
<td>14</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
<td>34</td>
<td>39</td>
<td>35</td>
<td>34</td>
<td>39</td>
</tr>
<tr>
<td>Strategic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Strategies use</td>
<td>12</td>
<td>12</td>
<td>13</td>
<td>5</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>14. Scaffolding</td>
<td>12</td>
<td>9</td>
<td>13</td>
<td>28</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>15. Variety of question types</td>
<td>13</td>
<td>9</td>
<td>12</td>
<td>14</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>37</td>
<td>30</td>
<td>38</td>
<td>37</td>
<td>40</td>
<td>45</td>
</tr>
<tr>
<td>Total 30 Item Scores</td>
<td>314</td>
<td>281</td>
<td>392</td>
<td>314</td>
<td>281</td>
<td>392</td>
</tr>
</tbody>
</table>
Table 25  

*Total Score Percentages of Teacher’s SIOP Model Implementation*

<table>
<thead>
<tr>
<th>Teacher A</th>
<th>Teacher B</th>
<th>Teacher C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Score %</td>
<td>65.4</td>
<td>58.5</td>
</tr>
</tbody>
</table>

Total percentage scores on the SIOP ranged from a low percentage score of 58.5 % for Teacher B to a high percentage score of 81.7% for Teacher C. These scores suggest that Teacher C implemented the SIOP model for sheltered instruction for ELLs at a higher level than Teacher A or Teacher B.

According to Echevarria et al. (2008), a score of 75% or higher demonstrates a high degree of SIOP implementation while a score of 50% or lower demonstrates a low degree of SIOP model implementation. Given these guidelines, Teacher C had a score demonstrating a high degree of SIOP model implementation across the four classroom observation periods. While Teachers A and B did not have a high degree of observed implementation, they both demonstrated SIOP implementation that was well above the 50% level.

As shown above in Table 24, the Preparation component score for Teacher A was 53; Teacher B’s score was 52; and Teacher C’s score was 83. The highest possible score for the Preparation component is 96. The scores indicate that Teacher C had a higher level of implementation for the Preparation component of the SIOP model as compared to Teacher A and Teacher B. In the Preparation component, effective SIOP teachers provide content concepts in lesson planning and select the instructional activities that help bridge the ELLs’ lack of background knowledge and potential gaps in
their educational experiences (Echevarria et al., 2008).

The Instruction Background component score for Teacher A was 32; Teacher B’s score was 25; and Teacher C’s score was 37. The highest possible score for the Instruction Background component is 48. As the scores indicate, Teacher C had a higher level of implementation for the Instruction Background component of the SIOP model compared to Teacher A and Teacher B. Effective methods for increasing comprehension include activating and making connections between the students’ previous background knowledge and presenting background information concerning the content materials prior to beginning the lesson (Echevarria et al., 2004).

The Comprehensible Input component of the SIOP model had a highest possible score of 48. The score for Teacher A was 35; Teacher B’s score was 34; and Teacher C had a score of 39. As the scores indicate, Teacher C had a higher level of implementation for the Comprehensible Input component of the SIOP model compared to Teacher A and Teacher B. High-quality sheltered lessons include a variety of instructional techniques, including adjusting teacher speech to accommodate ELLs varied English language proficiency levels and using gestures and hands-on activities to make the lesson more comprehensible for students (Echevarria et. al., 2004).

The Strategies component score has a highest possible score of 48. The score on this component for Teacher A was 37; Teacher B’s score was 30; and Teacher C’s score was 38. These scores indicate that Teachers A and C had a higher level of implementation for this component of the SIOP model compared to Teacher B. When employing teaching strategies, effective sheltered teachers use multiple approaches including the use of mnemonics for memorization, repetition of key concepts and
vocabulary, graphic organizers, and comprehension strategies such as predicting, and summarizing a text (Echevarria et al., 2004).

The Interaction component had a highest possible score of 64. The score on this component for Teacher A was 48; Teacher B’s score was 42; and Teacher C’s score was 54. The scores on the Interaction component indicate that Teacher C had a higher level of implementation for this component than did Teachers A or B. Effective sheltered lessons allow ELLs equal access to teachers for asking questions or clarifying understanding, offer a variety of student groupings to add to the learning experience, and increase English language usage and classroom participation (Echevarria, et. al., 2004).

The Practice/Application component had a highest possible score of 48. The score on this component for Teacher A was 34; Teacher B’s score was 30; and Teacher C’s score was 37. The scores indicated that Teacher C had a higher level of implementation for this component of the SIOP model compared to Teachers A and B. This component of the SIOP model of sheltered instruction is essential to ensure that students master the academic concepts. Instruction activities that include the four language domains of reading, writing, listening, and speaking during the practice and application portion of the lesson provide an effective means for ELLs to make connections to the academic content (Echevarria et al., 2004).

The Lesson Delivery component has a highest possible score of 64. The score on this component for Teacher A was 38; Teacher B’s score was 28; and Teacher C’s score was 59. The scores on this component indicate that Teacher C had a much higher level of implementation compared to Teacher A and Teacher B. Sheltered
lessons that contain clearly stated content objectives allow teachers and students to focus on and remember that which is most important. Effective sheltered teachers adjust the pace of the lesson to accommodate individual differences in students’ academic content knowledge and English language proficiency levels (Echevarria, et al., 2004).

The Review/Evaluation component has a highest possible score of 64. The score on this component for Teacher A was 37; Teacher B’s score was 40; and Teacher C’s score was 45. The scores on the Review/Evaluation component indicate that Teacher C had a higher level of implementation compared to Teacher A and Teacher B. Effective sheltered instruction teachers use multiple assessment methods, both formal and informal, to determine students’ progress and allow for positive feedback and fair evaluation of student performance (Echevarria et al., 2004).

In conclusion, the level of SIOP model implementation for Teacher A was 65.4%; Teacher B’s level was 58.5%; and Teacher C’s level was 81.7%. These percentage scores indicate that Teacher C had a high level of SIOP implementation, while Teachers A and B demonstrated a moderate level of SIOP implementation. Finally, the results from the teacher observation data indicated that the three teachers implemented the SIOP model for sheltered instruction well. The teacher observation data and the student achievement data from the 2007/2008 TELPAS and 2007/2008 TAKS, showed moderate to high levels of SIOP implementation and student achievement gains, clearly demonstrating that the SIOP model of sheltered instruction is an effective instructional model for use with secondary English language learners. These findings support the findings of previous studies concerning the efficacy of this sheltered instruction model
(Echevarria et al., 2000; Ardisana, 2007; Dennis, 2004).

Research Question 4, concerning how teachers’ perceive the SIOP model and their students’ academic success with the SIOP, was answered through oral interviews with the teacher participants using open-ended questions. The purpose of the interview was to gain a deeper understanding of the participating teachers’ perceptions of the SIOP model as an effective instructional method for ELLs and its effects on their students’ academic achievement. The teachers were interviewed, and their responses to the seven interview questions were recorded for analysis.

The teachers’ interview responses were generally in agreement with one another. Overall, the teachers perceived the model to be an effective method for instruction of their ELLs and commented that the SIOP model helps in their lesson planning by focusing them on what they need to do for their ELLs. The interview questions and teacher responses are reported below.

Oral Interview Questions

1. What is your perception or opinion of the SIOP model? What do you like and/or dislike about the SIOP model?
2. What successes and/or failures have you had in implementing the SIOP model? What are some specific examples of these successes and/or failures?
3. What is your perception of the overall impact of the SIOP model and your high school ELLs’ academic achievement? In your opinion, what about the model accounts for this impact?
4. Based on your experiences with the SIOP model, do you perceive it to be an effective instructional model for increasing the English language proficiency of high school level ELLs? Why or why not?
5. What specific component(s) of the SIOP model do you find effective for instructing ELLs? What specific component(s) of the SIOP model do you find ineffective? Why do you think these components are effective/ineffective?

6. Do your ELLs enjoy the SIOP model? Why or why not? Do you think these students perceive it to be helpful to them in their learning? Why or why not?

7. What changes or adaptations, if any, do/did you make when implementing the model with your ELLs? Why do/did you make them?

Oral Interview Research Questions and Teacher Responses

Research Question 4 sought to determine the current status of secondary teachers’ perceptions of the SIOP model, their success with the SIOP model, and their ELLs’ academic achievement under the SIOP model. The researcher assumed an analysis of the teachers’ perceptions of the SIOP model would result in strengthening understanding of teachers’ opinions of this model. Similarities and differences in their opinions were observed and noted below. Individual teachers’ perceptions of the SIOP model, their success with the SIOP model, and their perception of its impact on ELLs’ academic achievement are described.

Interview Question 1: What is your perception or opinion of the SIOP model? What do you like and/or dislike about the SIOP model?

Answering the first question Teacher A commented that the SIOP model is wonderful for her ELLs and for any student who struggles with learning. She stated that she likes that the model includes components that address students’ English language needs in the four language domains of reading, writing, speaking, and listening. Additionally, she stated that each time she plans her lesson she includes the language objectives component along with her content objectives to strengthen her students’ English language skills.
Teacher B commented that the SIOP is a good instructional model and she likes the component that requires specific strategies and techniques to address ELLs' language and academic content needs. She liked that the model incorporates components which address many aspects of good teaching.

Teacher C stated that the model provides a guideline to evaluate the needs of ELLs and also provides a clearly established format for lesson planning that is very helpful. She noted that SIOP contains many good components, but that, in her opinion, the model is similar to other strategies/techniques of sheltered instruction that are currently in use. She dislikes that there are so many different components in the model because it can become over-structured and cumbersome.

In the analysis of the teachers’ responses, all three liked the SIOP model and perceived it as an instructional model that provides a framework for lesson planning that allows for both academic content objectives and English language objectives. Teacher B commented that the SIOP was a good working model for all teachers. However, Teacher A and Teacher C disliked the fact that so many components, when employed, can make their lesson planning cumbersome and over-structured. It should be noted that in the Preparation component of the SIOP model, the researchers state that an effective sheltered lesson has academic content and English language objectives, but it is not necessary for both to be present in every lesson if they have been established in a previous lesson (Echevarria et. al., 2008).

The teacher observation scores on the Preparation component were as shown in Table 24: Teacher A - 53, Teacher B - 52, and Teacher C - 83 out of a possible score of 96. While all three teachers had a positive opinion of the SIOP model, Teacher C’s
The implementation level of the Preparation component was much higher than Teachers A or B. The observation scores suggest that Teacher C had a better understanding of how to implement this key component of the SIOP model effectively into the lesson planning process.

The teachers’ favorable comments concerning their perception of SIOP, their moderate to high degree of SIOP implementation and improved ELL student achievement scores, all indicate that SIOP is an effective instructional model for teaching ELLs.

Interview Question 2: What successes and/or failures have you had in implementing the SIOP model? What are some specific examples of these successes and/or failures?

Regarding Question 2, Teacher A commented that she believes that her students have had more success with the use of the SIOP model in her classes. Using the model, students have daily writing assignments. She provides writing prompts and models the processes needed to complete the writing assignment using appropriate grade-level English vocabulary. Teacher A stated, “That’s one good thing -last year about half the kids that took the TAKS passed; they were amazed. They did not expect that at all. Definitely the TAKS test was a huge success because I teach with the SIOP.”

Teacher B noted that her biggest success was in implementing the language objectives into the curriculum. She noted that for her non-ELL student English classes she does not implement language objectives. Teacher B believes that adding the English language objectives into her lessons has helped her ELLs. She noted that because she has implemented the SIOP model English language objectives component
she has seen success in teaching reading to her students. Teacher B also stated that “My students’ TAKS scores were higher after using SIOP.”

Teacher C commented that she uses the SIOP model to teach primary objectives because it helps her ELLs to learn the academic language associated with the concept being taught in her lessons. Teacher C stated that “Students need background building and vocabulary taught.” She believes that ELLs have more success when background of unfamiliar situations is related to something that is familiar to them. In their responses, teachers commented that success with the SIOP model was evident in several areas such as writing and reading. The teachers mentioned that their ELLs’ achievement scores on the English language TAKS test were higher after implementing the SIOP model. This improvement is demonstrated in the findings of the quantitative analysis. Teacher comments concerning their perceptions that improvement in their ELLs’ achievement scores on the TAKS English Arts test was due to their implementation of the SIOP model in their lesson planning and instruction were correct.

Interview Question 3: What is your perception of the overall impact of the SIOP model and your high school ELLs’ academic achievement? In your opinion, what about the model account for this impact?

Teacher A commented that her favorite sheltered strategies included using visuals and hands-on activities. These activities get students actively engaged with the content and with peers. She noted that both the modeling and the visuals are her favorite strategies because “The kids aren’t bored. They’re having fun.” This results in more student engagement. The model is student-centered and is designed for struggling learners as well as ELLs; she believes that the SIOP model is an effective
method of teaching.

Teacher B believes that the emphasis on academic vocabulary and English language objectives increases the opportunities to learn the grammatical structures and syntax of the language. She commented that she regards these two components of the SIOP model as the most effective in regard to her students’ academic achievement. In closing, she stated, “The SIOP model has helped to raise the scores of all our school’s ELLs. It takes in all aspects of learning.”

Teacher C thinks that the SIOP model’s recommendation for displaying and referring to the daily objectives of the lesson are key to helping students succeed. Additionally, the model stresses that teaching the academic vocabulary in advance as well as within the daily lesson is important for her ELLs. She concluded, “Students are successful with the SIOP model.”

Teacher B commented that the SIOP had a positive impact on student achievement, as did Teacher A, who also stressed the impact on student achievement scores and increased passing rates. Teacher A mentioned that using a variety of teaching strategies was important for student learning, and she concluded by saying that her ELLs are successful with the SIOP model. As noted in the quantitative data, student achievement scores on both the TELPAS and TAKS exams increased with the teachers’ implementation of the SIOP model of sheltered instruction.

Interview Question 4: Based on your experiences with the SIOP model, do you perceive it to be an effective instructional model for increasing the English language proficiency of high school level ELLs? Why or why not?
Teacher A commented that she did perceive the model as effective, and, in her opinion, the SIOP model was designed for ELLs’ academic achievement. Students are actively engaged in the learning process and know what is expected of them. The focus of the SIOP model is on student academic achievement and English language proficiency. Teacher A adds, “Based on my experience, the SIOP model is an effective tool for increasing English language proficiency.” She noted that the model emphasizes that, through scaffolding of lesson content, ELLs can build a solid learning foundation.

Teacher B also perceived the model as effective for instruction of her ELLs, and stated that she believes the SIOP is a good method of teaching. She commented that the SIOP model’s recommendation of effective sheltered strategies (i.e. use of charts and graphs and slower speech) has led to better student understanding. She stated, “I have a tendency to talk really fast. I’ve really been conscientious in my ESL classes about slowing down, speaking thoughtfully, using terms they can understand.” She believes that the SIOP model helps her ELLs to increase language proficiency because it stresses academic vocabulary skills.

Teacher C also perceived the model as a good method of instruction and commented that the SIOP model enhances ELLs’ chances for academic success and is an effective model of sheltered instruction. She added, “Anything that helps the student to have a broader understanding of the concept being taught is helpful.”

The teachers all agreed that the SIOP model of sheltered instruction is an effective model for increasing English language proficiency among their ELLs. Teacher A commented that the SIOP was an effective model, noting that the SIOP is student-centered. Teacher B also thought the SIOP is effective, commenting that the model
increases her ELLs’ language proficiency by stressing academic vocabulary skills. Research has shown that effective sheltered lessons apply varied learning strategies as well as the teacher’s modeling of his/her own thought processes. These three teachers are using these strategies to help develop students’ awareness of the importance of self-monitoring and self-regulation in their learning (O’Mally & Chamot, 1990; Echevarria et. al., 2008). Again, given the teachers’ comments on the SIOP model’s effects on ELLs’ academic achievement, the results of the teacher observations of SIOP implementation, and the two student achievement measures, all four data sources indicate that the SIOP model of sheltered instruction, when properly implemented, has a positive effect on student achievement outcomes.

Interview Question 5: What specific component(s) of the SIOP model do you find effective for instructing ELLs? What specific component(s) of the SIOP model do you find ineffective? Why do you think these components are effective/ineffective?

Teacher A commented that she liked the fact that the SIOP is a hands-on model because her students enjoy being active while they are learning. She noted that when her students are actively involved they remember the content material. She has found that “There is not a component of SIOP that is not effective.” The SIOP is learner-centered and, in her opinion, that is how teaching should be.

Teacher B commented that she has found that the practice and application component of the SIOP model is one of the most effective. This component of the SIOP model gives her students an opportunity to become independent learners.
Teacher C stated that the Building Background/Preteaching vocabulary are component(s) of the SIOP model she found to be effective in her lessons. However, she had a concern that including all 30 components of the SIOP may lead teachers to overstructure their sheltered lessons. She noted that while providing more background knowledge and preteaching vocabulary leads to better understanding and more success, overstructuring a lesson may potentially overlook individual student needs.

All three participants found the SIOP model components to be effective. Teacher B found the Practice/Application component to be most effective for teaching ELLs. Teacher C found that the Building Background component leads to more student success because it included the pre-teaching key vocabulary feature. Teacher A stated, “Honestly, there is not a component of the SIOP that is not effective. It is learner-centered, which is how teaching should be.” The total levels of SIOP model implementation were Teacher A 65.4%, Teacher B 58.5% and Teacher C 81.7%.

As previously stated, the findings from the two student achievement measures indicate that the means of the TELPAS English language proficiency exam and TAKS English language Arts scores increased from year to year. Teacher C had the highest level of SIOP implementation, 81.7%, and her students showed the highest gain score increase on the TELPAS exam. This finding suggests that Teacher C was more adept in selecting components of the SIOP for use in her daily lesson activities than Teacher A or B.

Interview Question 6: Do your ELLs enjoy the SIOP model? Why or why not? Do you think these students perceive it to be helpful to them in their learning? Why or why not?

Teacher A commented that her students enjoy the SIOP model, specifically the
hands-on approach. Her students also benefited from her modeling examples and using pictures and symbols that facilitated their understanding of lesson concepts.

Teacher B also commented that her students enjoyed the SIOP model. Specifically, her ELLs liked the group activities, the hands-on activities, and activities that used charts and graphs to help with student understanding. Teacher B stated, “Yes, I think they see it as helpful because they get to work with the materials rather than listening to a teacher lecture.” Students are more engaged in the learning process with the SIOP model.

Teacher C also found that her students enjoyed their SIOP lessons. She noted that the SIOP model enabled her students to understand the content and English language objectives more clearly. She understands how the various components of the SIOP model can engage and enhance her ELLs’ learning experiences and the importance of implementing these components into her daily lesson plans.

These three teachers agreed that their ELLs did enjoy the SIOP model. Teachers A and B believe students enjoy the SIOP because sheltered lessons use a hands-on approach, along with cooperative learning activities that keep students engaged in the lesson. Teacher C commented that students enjoy the SIOP model because they have a better understanding of the lesson content. By using a variety of techniques that keep the student engaged in learning and practicing their language skills, teachers encourage students to reach their lesson objectives (Echevarria et al., 2008).

On the Lesson Delivery Component of the SIOP model that includes the student engagement feature, the participants’ scores were Teacher A - 38, Teacher B - 28 and Teacher C - 59 out of a possible 64. As these scores indicate, Teacher C clearly has a
better understanding of how to implement this component of the SIOP model effectively. The teachers’ perspectives and the quantitative data all indicate that using the SIOP model for planning and delivery of their sheltered lessons has resulted in increased ELL student achievement scores.

Interview Question 7: What changes or adaptations, if any, do/did you make when implementing the model with your ELLs? Why do/did you make them?

Teacher A commented that she had not made any adaptations to the SIOP model in her sheltered lessons.

Teacher B commented that sometimes she had to shorten or leave out components in her sheltered lessons because of time constraints. Teacher B did not comment on specific components she omitted from her lessons.

Teacher C commented that many techniques and strategies were incorporated into her SIOP lessons that she used to address specific students’ academic or English language needs.

The SIOP model is designed to be flexible and allows teachers to be creative in their lesson planning. The model does not require teachers to use each of its thirty components in every lesson (Echevarria et al., 2008). Thus, the model can accommodate teachers’ varied teaching styles and individual student needs while providing a consistent framework for planning and delivery of sheltered lessons.

In her response to the question above, Teacher A commented that she had not made any changes to the model. Teacher B commented that she sometimes had to omit components of the SIOP in her daily lessons because of time constraints. Teacher
B had the lowest level of SIOP implementation, 58.5%, and her students showed the smallest gains. Given her comments concerning time constraints and difficulty in planning her lessons, it is not surprising that her lack of understanding of the model affected her use of the SIOP in daily activities. Teacher C commented on her use of specific teaching strategies and sheltered techniques to address individual student’s learning styles. This comment suggests that she has a better understanding of the nuances of the SIOP model and how to use each of the model’s components to benefit each of her ELLs’ specific needs.

Though each teacher may have a different teaching style, the SIOP model can accommodate these differences. However, effective implementation of the model will include the use of all of its 30 components at some point during the unit’s lessons.

The data collected from the ELLs’ achievement tests on the TELPAS and TAKS scores, along with the four teacher observation measurements and teacher comments concerning their perceptions and successes implementing the SIOP model suggests that, although these teachers were not implementing all of the components of the SIOP model in every lesson, overall, they implemented the SIOP model effectively.

The teachers noted that the SIOP model focused on students’ academic and English language needs by incorporating both content objectives and language objectives into the lesson plan cycle. They perceived that the SIOP model had a positive impact on ELLs’ academic achievement, and the quantitative data did find increased scores on the TELPAS and TAKS exams.

Finally, the positive opinions that all three veteran classroom teachers have of the SIOP model as well as the positive impact on ELLs’ academic achievement,
suggest that they will continue to use the SIOP model for their sheltered lessons. This study’s findings have demonstrated that the higher the level of SIOP implementation, the greater the student academic achievement gains. The SIOP is a model that has been well researched and is designed to provide teachers in the content areas with a framework for preparing and implementing sheltered lessons, while providing both academic content objectives and English language objectives.

Summary

In this chapter, the findings and results of the analyses of the four data sources were presented addressing each of the study’s research questions. Chapter 5 consists of a discussion of the results presented in this chapter along with the conclusions, limitations, and implications of this study’s findings, including recommendations for future studies.
CHAPTER 5

CONCLUSIONS, DISCUSSION, AND RECOMMENDATIONS

This chapter restates the research problem and briefly reviews the methodology. The major sections of this chapter include a brief summary of the results, discussion of the results, limitations of this study, and recommendations for future studies.

The purpose of this research was to examine the effect of the sheltered instruction observation protocol (SIOP) model on Hispanic high school English language learners’ (ELL) academic achievement as measured by standardized tests for the Texas English Language Proficiency Assessment System (TELPAS) and the Texas Assessment of Knowledge and Skills (TAKS) in English language arts.

Additionally, this study sought to ascertain the participant teachers’ degree of SIOP model implementation and their perceptions of the model’s effects upon their ELLs’ academic success. Study participants included three high school English language arts teachers. The three teachers who participated in this study received SIOP training during the summer at a regional education service center. They were all experienced English language arts teachers who had previously taught ELLs.

The study measured student achievement data on standardized tests for the TELPAS and the TAKS in English language arts. Data concerning the implementation of the SIOP model were gathered through observations conducted in all three classrooms. Finally, individual interviews provided the teachers’ viewpoints and perspectives of the SIOP model and its effect on instruction and academic achievement.

The research reported here embodies both a qualitative and quantitative perspective. The dependent variable in this study was the academic achievement of
The following research questions guided this study:

1. What is the effect of sheltered instruction operational protocol (SIOP)-based instruction on secondary Hispanic English language earners’ (Ells’) English language proficiency as measured by the Texas English Language Proficiency Assessment System (TELPAS)?

2. What is the effect of sheltered instruction operational protocol (SIOP) - based instruction on secondary Hispanic English language learners’ (Ells’) English language arts achievement as measured by Texas Assessment of Knowledge and Skills (TAKS)?

3. What is the current status of secondary teachers’ quality of sheltered instruction operational protocol (SIOP) instruction and degree of implementation at four points during the school year?

4. What is the current status of secondary sheltered instruction operational protocol (SIOP) teachers’ perceptions of the SIOP model, their own success in SIOP implementation and their students’ achievement under the SIOP model?

Summary of Major Findings

Though limited in scope, this study provided meaningful results. On Research Questions 1 and 2, student achievement data were gathered from the state administered TELPAS, measuring ELL students’ English proficiency level, and TAKS exam, measuring English Language Arts.

Research Question 1 analyzed student data on the TELPAS exam. The results of the paired samples t-test indicate that there was a statistically significant difference between the 2007 and 2008 means (t (23)= 4.052, p < .05, d = .50) on the TELPAS English language proficiency test with the means scores of these students increasing year to year between 2007 and 2008. These findings indicate that the subject teachers’ implementation of the SIOP model in their sheltered lessons resulted in improved
English language proficiency scores on the TELPAS exam. Additionally, an ANOVA was made to determine if there were differences between the three teacher’s classes. The ANOVA of the TELPAS found that there were statistically significant differences between the three teacher’s classes in both 2007 and 2008 in the TELPAS scores. Teacher C’s class reported the largest mean difference increase at .5400, while Teacher B’s class had the smallest mean difference increase at .4083. Teacher A’s class reported a mean difference of 0.4286. The total mean difference increase for the three teacher’s classes on the 2007/2008 TELPAS pretest/post-test scores was .4417. This is a major finding of this study when correlated with these teachers’ levels of SIOP implementation, finding that Teacher C had the highest SIOP implementation level of 81.7%, while Teacher A had 65.4%, and Teacher B had 58.5%. These findings demonstrate that the higher the level of teacher SIOP implementation, the greater the student achievement gains.

Research Question 2 analyzed student data on the 2007 and 2008 TAKS English language arts exam. The results on the statistical analysis of the 2007 and 2008 TAKS exam paired samples \( t \) test did not indicate a statistically significant difference between the pretest and post-test English TAKS score means. However, a mean score of 2038.06 on the 2008 TAKS pretest did reveal a gain of 32 points when compared to the mean score on the 2007 TAKS pretest of 2006.65. There were no statistically significant differences between the teacher classes to report.

In the within group comparison of the pretest/post-test TAKS scores, the ANOVA indicates that Teacher A’s class showed the largest mean increase with a 63.20, and Teacher B’s class had a mean increase of 41.37. Teacher C’s class had a decrease of
28.25. Teachers A and B students’ scores increased from 2007-2008 year to year, Teacher C students’ scores decreased. Although this did not reduce the overall mean increase from year to year, this finding was not expected.

Data for Research Question 3 were gathered via observations of the sample teachers during ELL instruction in the sheltered classes. Teachers were observed instructing their ELLs at four points during the school year. The measurement tool was the SIOP, developed by researchers Echevarria, Vogt, and Short (2004) and has been found to be valid and reliable. Teacher implementation of the SIOP model, as measured by the instrument resulted in total percentage scores ranging from a minimum score of 58.5% for Teacher B to a maximum percentage score of 81.7% for Teacher C. According to Echevarria, Vogt, and Short (2008), a score of 75% or higher demonstrates a high degree of SIOP implementation while a score of 50% or lower demonstrates a low degree of SIOP model implementation. The results from the teacher observation data indicated that the three teachers had moderate to high implementation of the SIOP model for sheltered instruction. Additionally, as noted above, the quantitative analyses on the student achievement measures from this study indicated that higher levels of SIOP implementation resulted in higher student achievement scores.

Research Question 4, concerning how the teachers perceived the SIOP model and its effect on their Hispanic ELLs’ academic success, was answered through oral interviews with the teacher participants using open-ended questions. The results of the interviews demonstrated that the three teachers did perceive the SIOP model to be effective for instructing ELLs. The teachers perceived the SIOP model as effective for
delivery of English language arts content through sheltered instruction lessons for high school ELLs. The teachers agreed that the SIOP model’s components provided a consistent structure for planning and delivery of their sheltered lessons. These teachers’ positive opinions of the SIOP model were confirmed by the study’s findings that demonstrated that the higher the level of SIOP implementation, the greater the student academic achievement gains.

In conclusion, the study’s four data sources consisting of the teachers perceptions of the SIOP model, the teacher observation data and the student achievement data from the 2007/2008 TELPAS and 2007/2008 TAKS clearly demonstrate that the SIOP model of sheltered instruction is an effective instructional model for use with secondary English language learners. These findings support the findings of previous studies concerning the efficacy of this sheltered instruction model (Echevarria, et al., 2004; Ardisana, 2007; Dennis, 2004).

Discussion of Major Findings

The results of this study support theories and research examined in the review of the literature. The federal act of 2001, No Child Left Behind (NCLB), with its emphasis on student achievement accountability, prompted many states to begin implementing high stakes testing into the core content areas of reading, writing, mathematics, science, and social studies for their students.

In the state of Texas, high school students are required to pass these content area tests in order to graduate. Fry (2007) reports that, nationally, ELLs score far behind white students in both reading and math on these standardized achievement tests.
Additionally, Echevarria et al. (2008) highlight the fact that Hispanic students have the highest dropout rate when compared to other ethnic groups. The Texas Education Agency Enrollment report for 2008-2009 reported that Hispanic students are now the major ethnic group comprising 48% of Texas public school students, and the percentage is expected to continue to increase. It is imperative that administrators and classroom teachers focus their efforts on meeting the academic requirements of these students.

In this study, the four research questions addressed the effectiveness of the sheltered instruction operation protocol (SIOP) model to meet the academic needs of ELLs in the content areas. The students’ scores on the TELPAS exam indicate a significant difference between the pretest and post-test student achievement scores. In this study the participant teachers implemented the SIOP model for sheltered instruction for their Hispanic ELLs. The observations of the three teachers revealed that Teacher C, who had implemented the SIOP model at the highest level, also had the highest gain scores on the TELPAS student achievement assessment. Teacher A, who had the second highest level of SIOP implementation, had the second highest gain in student scores and Teacher B who had the lowest level of SIOP implementation had the smallest gain in student scores.

In other words, in this study, the more effective the teacher was at implementing the SIOP model, the more success the students experienced. This finding supports the use of the SIOP model of sheltered instruction as part of a comprehensive English as a second language program (ESL) where ELLs are provided with daily English/language arts lessons in a supportive learning environment, designed to meet their linguistic and
Although the findings of the TAKS exam did not indicate a significant difference between the pretest and post-test student scores, the scores did increase from year to year. The lack of statistical significance may be attributed to the small sample size.

The degree of teacher SIOP implementation ranged from 58.5% for Teacher B to 81.7% for Teacher C. Teacher A had a SIOP implementation level of 65.4%. These findings, although in the moderate to high implementation range, would still seem to indicate a need for ongoing teacher support such as a scheduled period for collaboration and planning. Previous researchers have recommended follow-up professional development training or a campus coach to assist teachers with implementing strategies and practices proven to be effective for diverse student populations. Other contributing factors, as Calderón (2007) notes, could be that secondary ELLs are more likely to have experienced gaps in formal schooling and that the literacy skills required at the secondary level are considerably more complex and embedded than in the elementary levels. Echevarria et al. (2004) also noted English language proficiency, socioeconomic status, and age of student when entering into the American school system are some additional factors that affect student achievement outcomes.

Two distinguishing components of the SIOP model are the inclusion of both content objectives and language objectives in teachers’ lesson plans. It is essential for teachers to ensure that these two key components, content objectives and language objectives, are included in their daily lesson plans.
Krashen’s (1982) and Cummins’s (1984) theories on second language acquisition emphasize the need for academic content as well as meaningful language input when instructing ELLs. Indeed, Cummins (1984) notes that a central factor in why ELLs often fail to develop high levels of second language academic skills is because their initial instruction has stressed context-reduced communication, insofar as instruction in English has not linked the students’ prior knowledge to the content of the lesson. This lack of context may be a factor worthy of further study.

Finally, in this study, the teacher interviews provided an understanding of their perceptions on the efficacy of the SIOP model. The interviews revealed that all three-teacher participants were in agreement that the model was an effective tool for instructing ELLs. Teacher C noted, “It gives a clear guideline to evaluate the needs of the ELL student and provides a clearly established lesson plan format.” As to the models effects on student achievement Teacher A stated, “The whole model is designed for student achievement”, and Teacher B stated, “It enhances their chances for academic success” and “it’s just a good overall method for instructing which everybody ought to be using to some extent.” It is clear from the interviews that these teachers believe that the SIOP model is effective for instructing high school ELLs.

Although the teachers perceived the model to be effective, their lack of consistency in implementing all of the SIOP components across the observation period was evident. This is demonstrated by the fact that both Teacher A and B acknowledged the benefit to their ELLs when the SIOP model is effectively implemented, yet both Teacher A and B scored at or below the 50 percentile level on two important components (content and language objectives) of the SIOP model. This may account for
the lower student scores on the TELPAS assessment compared to Teacher C who scored above 85% on both of these important SIOP measures. The lack of consistency in implementing all the components of the SIOP model (across time, not in single lessons) may be attributed to factors such as a shortage of time to plan and adapt lessons, lack of opportunity to collaborate with peers, and little accountability from administrators (Miner, 2006). Indeed, Teacher B, with the lowest level of SIOP model implementation, commented that sometimes she would leave out SIOP components because of time constraints. These teachers worked together in the English department; however, they did not mention, nor were they observed, discussing or planning their SIOP lessons. Additionally, research by Torres (2006) found that administrators also need on-going professional development in sheltered instruction in order to evaluate teacher implementation efforts effectively. The administrator of the English department had no training in the SIOP model, although the ESL program was her responsibility. When theory, modeling, practice, feedback, and peer collaboration are integrated into a comprehensive staff development program, teacher transfer into the classroom and positive student outcomes will result (Calderón, 2007).

Previous studies by Echevarria et al. (2004), Ardisana (2007) Dennis (2004), have confirmed the efficacy of the SIOP model for instructing ELLs. This study found statistical evidence from the pretest/post-test scores of the two student assessment measures and the teacher observation data that indicated that the SIOP model of sheltered instruction, when properly implemented, provided support for secondary Hispanic ELL student achievement. In this study, according to the teacher interview responses, all the teacher participants perceived the SIOP model to be an effective and
well-designed instructional model for teaching secondary ELLs.

Implications and Recommendations

As classroom teachers, a key indicator of professional performance is the academic achievement of the students. It is through the application of research-based instructional models and effective classroom practices that teachers can provide students with the specific content knowledge necessary for their success.

The Sheltered Instruction Operational Protocol (SIOP) model is research-based and specifically designed for teaching subject-area content to English language learners. A review of the available literature found that there were few studies addressing the efficacy of the SIOP model and its use for instructing secondary high school ELLs. The original research was a seven-year study (1993-2003) conducted by Drs. Jana Echevarria and Deborah Short involving middle school teachers in four urban school districts. Since then additional studies have been conducted by Ardisana (2007) with fourth and fifth grade teachers and Dennis (2004) with middle-school teachers. The model has been in use in school districts throughout the country with measurable success since the 1990s (Echevarria et al., 2008).

Several limitations are inherent to this study. First, it was conducted at one high school. Secondly, the study examined only the academic achievement data of Hispanic heritage students and did not include other ELL groups such as Asian or Arab populations. Finally, the study only looked at secondary English teachers and did not include teachers from other content areas. Additional factors, such as when students entered into the American school system and students’ previous schooling, may also
have influenced the study’s results. The combination of these factors limits the
generalization of this study’s findings to other settings or other student populations.

This study provides a baseline for future research on the implementation of the
SIOP. As there have been few studies on SIOP at the secondary level, the following are
presented as suggestions for future research:

1. What are the effects of sheltered instruction on secondary ELLs’ academic
   achievement at multiple sites in both urban and rural settings?

2. What are the effects of SIOP model implementation on secondary
   ELLs’ academic achievement in the content areas of Math,
   Science and Social Studies?

3. How do school administrators evaluate content area teachers in
   sheltered classrooms and what instructional support do they provide
   for their teachers?

In addition to the above recommendations, teachers should consider the
appropriate English language proficiency standards when implementing the SIOP into
their content lessons. Teachers should choose learning strategies that promote those
cognitive and critical thinking processes that are required to master the difficult
academic language and content at the secondary level.

Summary

On the two student assessment measures, the findings of this study indicate that
there were increases in academic achievement among the Hispanic ELLs who
participated. On the TELPAS assessment, the students of the teacher with the highest
level of SIOP implementation made the highest gains; the students of the teacher with
the second highest SIOP implementation level made the second highest gains; the
students of the teacher with the lowest level of SIOP implementation made the smallest gains. These findings indicate that the higher the level of SIOP implementation, the greater the student academic achievement gains. The gains in academic achievement attributed to the proper implementation of the SIOP model can have an extensive impact on English Language Learners who have not previously experienced academic success. The three teachers who participated in this study unanimously perceived the SIOP model as an effective model of instruction for high school ELLs. These experienced language arts instructors found the SIOP model to be an additional instructional tool that enhances student learning and achievement.

Finally, teachers must use the available research data and instructional strategies for teaching ELLs. Teachers must create lessons that remain loyal to the SIOP model by incorporating all of the models protocols in their lesson planning, classroom practices, and assessments of ELLs’ academic achievement.
APPENDIX A

INSTITUTIONAL REVIEW BOARD (IRB) APPROVAL LETTER
December 17, 2007

Rodney Bertram
Department of Teacher Education and Administration
University of North Texas

Re: Human Subjects Application No. 07-463

Dear Mr. Bertram:

As permitted by federal law and regulations governing the use of human subjects in research projects (45 CFR 46), the UNT Institutional Review Board has reviewed your proposed project titled “Sheltered Instruction: Instructing Hispanic English Language Learners in the Secondary Content Areas.” The risks inherent in this research are minimal, and the potential benefits to the subject outweigh those risks. The submitted protocol is hereby approved for the use of human subjects in this study. Federal Policy 45 CFR 46.109(e) stipulates that IRB approval is for one year only, December 17, 2007 to December 16, 2008.

Enclosed is the consent document with stamped IRB approval. Please copy and use this form only for your study subjects.

It is your responsibility according to U.S. Department of Health and Human Services regulations to submit annual and terminal progress reports to the IRB for this project. Please mark your calendar accordingly. The IRB must also review this project prior to any modifications.

Please contact Shiela Bourns, Research Compliance Administrator, or Boyd Herndon, Director of Research Compliance, at extension 3940, if you wish to make changes or need additional information.

Sincerely,

Kenneth W. Sewell, Ph.D.
Chair
Institutional Review Board

KS: sb
CC: Dr. Gloria Contreras
APPENDIX B

SHELTERED INSTRUCTION OBSERVATION PROTOCOL (SIOP)

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### The Sheltered Instruction Observation Protocol (SIOP®)

**Observer(s):**

**Teacher:**

**Date:**

**School:**

**Grade:**

**Class/Topic:**

**ESL Level:**

**Lesson:** Multi-day  Single-day  (circle one)

Total Points Possible: 120 (Subtract 4 points for each NA given)

Total Points Earned:  

Percentage Score:  

**Directions:** Circle the number that best reflects what you observe in a sheltered lesson. You may give a score from 0-4 (or NA on selected items). Circle under “Comments” specific examples of the behaviors observed.

<table>
<thead>
<tr>
<th>Highly Evident</th>
<th>Somewhat Evident</th>
<th>Not Evident</th>
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</thead>
<tbody>
<tr>
<td>4</td>
<td>3</td>
<td>2</td>
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<tr>
<td>1</td>
<td>1</td>
<td>0</td>
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#### Preparation

1. **Content objectives** clearly defined, displayed, and reviewed with students
2. **Language objectives** clearly defined, displayed, and reviewed with students
3. **Content concepts** appropriate for age and educational background level of students
4. **Supplementary materials** used to a high degree, making the lesson clear and meaningful (e.g., computer programs, graphs, models, visuals)
5. **Adaptation of content** (e.g., text, assignment) to all levels of student proficiency
6. **Meaningful activities** that integrate lesson concepts (e.g., surveys, letter writing, simulations, constructing models) with language practice opportunities for reading, writing, listening, and/or speaking

**Comments:**

#### Building Background

7. **Concepts explicitly linked** to students’ background experiences
8. **Links explicitly made** between past learning and new concepts
9. **Key vocabulary** emphasized (e.g., introduced, written, repeated, and highlighted for students to see)

**Comments:**

#### Comprehensible Input

10. **Speech** appropriate for students’ proficiency level (e.g., slower rate, enunciation, and simple sentence structure for beginners)
11. **Clear explanation** of academic tasks
12. **A variety of techniques** used to make content concepts clear (e.g., modeling, visuals, hands-on activities, demonstrations, gestures, body language)

**Comments:**

#### Strategies

13. Ample opportunities provided for students to use learning strategies

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<thead>
<tr>
<th></th>
<th>Highly Evident</th>
<th>Somewhat Evident</th>
<th>Not Evident</th>
<th>Comments:</th>
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<tbody>
<tr>
<td>14. <strong>Scaffolding techniques</strong> consistently used assisting and supporting student understanding (e.g., think-alouds)</td>
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<td>15. A variety of <strong>questions or tasks that promote higher-order thinking skills</strong> (e.g., literal, analytical, and interpretive questions)</td>
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<td><strong>Interaction</strong></td>
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<td>16. Frequent opportunities for interaction and discussion between teacher/student and among students, which encourage elaborated responses about lesson concepts</td>
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<td>17. <strong>Grouping configurations</strong> support language and content objectives of the lesson</td>
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<td>18. <strong>Sufficient wait time for student responses</strong> consistently provided</td>
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<td>NA</td>
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<tr>
<td>19. Ample opportunities for students to <strong>clarify key concepts in L1</strong> as needed with aide, peer, or L1 text</td>
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<tr>
<td><strong>Practice/Application</strong></td>
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<td>20. <strong>Hands-on materials and/or manipulatives</strong> provided for students to practice using new content knowledge</td>
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<tr>
<td>21. Activities provided for students to <strong>apply content and language knowledge</strong> in the classroom</td>
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<td>22. Activities integrate all <strong>language skills</strong> (i.e., reading, writing, listening, and speaking)</td>
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<tr>
<td><strong>Lesson Delivery</strong></td>
<td>4</td>
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<td>23. <strong>Content objectives</strong> clearly supported by lesson delivery</td>
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<tr>
<td>24. <strong>Language objectives</strong> clearly supported by lesson delivery</td>
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<td>25. <strong>Students engaged</strong> approximately 90% to 100% of the period</td>
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<td>26. <strong>Pacing of the lesson</strong> appropriate to students’ ability level</td>
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<tr>
<td><strong>Review/Assessment</strong></td>
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<td>27. Comprehensive <strong>review of key vocabulary</strong></td>
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<tr>
<td>28. Comprehensive <strong>review of key content concepts</strong></td>
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<td>29. Regular <strong>feedback</strong> provided to students on their output (e.g., language, content, work)</td>
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<td>30. <strong>Assessment of student comprehension and learning</strong> of all lesson objectives (e.g., spot checking, group response) throughout the lesson</td>
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</table>

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REFERENCES


