1-1-2011

# Teaching english language learners in mainstream science classrooms: teacher practice and educational opportunity

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Recommended Citation

# TEACHING ENGLISH LANGUAGE LEARNERS IN MAINSTREAM SCIENCE CLASSROOMS: TEACHER PRACTICE AND EDUCATIONAL OPPORTUNITY

by:

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## DISSERTATION

Submitted to the Graduate School

of Wayne State University,

Detroit, Michigan

in partial fulfillment of the requirements

for the degree of

## DOCTOR OF PHILOSOPHY

2011

MAJOR: CURRICULUM AND INSTRUCTION

Approved by:

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Advisor                          Date

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**DEDICATION**

To my Mother and Father for helping me appreciate the value of education and modeling for me cultural competence in our diverse society.

To my Brother Henry for his unwavering love and support.

To my grandsons Khalid, Marcus, and Jermane for their unfailing love and support in attaining my goals and for making me a proud parent.

## ACKNOWLEDGMENTS

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CHAPTER 1: INTRODUCTION

Equality of educational opportunity has long been central to the mission of public schooling in the U.S. In an overview of the history of public schools, Deschenes, Cuban, and Tyack (2001) observed that common-school proponents in the early 19th century viewed a proper educational system to be "one that mixed together all people in a free and public institution, [and] could provide equality of educational opportunity that would lead in turn to fair competition in the quest for achievement later in life" (pp. 529-530). A focus on equality of educational opportunity remains undimmed in U.S. schools today, where standards-based reforms, built on a platform of equalizing educational opportunity through high academic standards for all students, have been adopted nationwide (see U.S. Department of Education, 2002). Although equal educational opportunity, in principle, seems to have positive implications for English language learners (ELLs), research is needed to document its real classroom effects.

Science education is intended for all students. Academic instruction must be designed so that each student has the opportunity to master science standards that provide systematic and coherent access to this challenging subject. Instruction for English language learners (ELLs) in the academic language of science is critical and must be specifically designed, planned and taught. Science education must reach the student population classified as ELLs. Among the many challenges facing teachers of ELLs at all grade levels are the purposeful development of scientific written and oral discourse, science-specific academic language, and standards-based understandings. These are three key aspects to look for in the science classroom. With these skills, ELLs hopefully succeed in the all-English classroom, eventually be reclassified as formerly limited English language proficient (FLEP), and graduate from high school prepared for postsecondary study and careers.

Designing and implementing effective science instruction for ELLs should be a major emphasis in Michigan schools. The topics addressed and examined in my qualitative ethnographic research study in a large, diverse suburban high school are modifying instruction, developing academic language, and equal educational opportunity in three mainstream science classrooms. I examined the special challenges to science teachers working with ELLs and the proposition that science teachers can be highly effective language teachers.

There are key factors that are often lost during political battles over language minority education in Michigan and the nation. For instance, understanding and maintaining awareness of the complex political, social, and economic reality of these students guides establishing a firm foundation to assess the appropriateness of competing pedagogical philosophies and approaches. An upgrading of services to the ELLs population can become a reality only via teachers who are personally and professionally committed to work toward an education that would be acceptable for their own children. Despite abundant evidence of the educational system's failure to assure success for all students, it has yet to respond with authenticity and quality implementation.

First of all, the U. S. Supreme Court and other federal courts have identified ELLs as students requiring special instruction. At a minimum, schools must select appropriate approaches based on scientific research, implement those approaches, and monitor student progress. To ignore the language proficiency of ELLs is to violate their civil rights and doom them to academic failure. They are systematically pushed out and resigned to drop out at the secondary level. Extraordinary means, such as the implementation of the Sheltered Instruction Observation Protocol (SIOP) and use of the primary language, whenever possible, are called on to avoid and/or make up for educational deficits and facilitate the acquisition of English.

In many Michigan school districts, the possibility of teaching science through the primary

language has been largely foreclosed because of the diverse languages represented. Instructional strategies for ELLs that are demonstrated during professional development at many school districts are good teaching practices for all students. What is often omitted in professional development is what the ELLs bring to the pedagogical encounter. Whereas for other students the approach may further clarify a concept, for the ELLs the same approach may be an instructional life raft, which rescues the student from an otherwise incomprehensible science lesson. ELLs often find themselves overwhelmed by a foreign language not their own, in an unwelcoming school environment where they are reluctant to participate actively. In addition, the affective environment may not be conducive to learning. Ultimately, second language development proves a personal and idiosyncratic journey in which the science classroom can provide motivation and situations to use English for meaningful communication.

Among the many challenges facing teachers of ELLs is the purposeful development of academic language through science instruction in departmentalized, mainstream settings. For ELLs to succeed in an all-English classroom, to eventually be reclassified to formerly limited English proficient (FLEP), and to graduate from high school, they need to be instructed in discipline-specific and appropriate language. Many teachers are familiar with some strategies or techniques for making instruction understandable for English learners, such as using visuals, repeating key vocabulary, or pacing and slowing their speech. Teachers need a way to consistently and systematically implement best practices to provide optimal learning conditions for ELLs. The SIOP Model provides a framework composed of research-based features of instruction (Echevarria, Vogt, & Short, 2008).

At present, in most high schools resources are dedicated to the earliest stages of English language development where the students' needs are the most obvious. Newcomers and

beginning ELLs learn survival and classroom coping skills. Once oral social language is present, short answers, smiles, nodding heads, and barely getting by in academic subjects can mask student's needs for more demanding academic language. Limited resources and extra help may be withdrawn in order to serve those at lower proficiency levels, or withheld because it is seen as unnecessary for academic progress.

As a consequence, large numbers of ELLs reach early intermediate and high intermediate levels of English proficiency, and stay there. Statewide, these students number in the thousands; they do poorly academically, and receive little specialized instructional attention. They struggle, but never excel or thrive in the classroom. Their mastery of science content standards is inadequate and leaves them unprepared for higher education. Some students leave high school after many years as ELLs, with or without a diploma. With increasing graduation requirements, leaving without the diploma might become the norm unless schooling strengthens services to ELLs in science as well as the other core subjects.

A linguistic profile of ELLs reveals social speaking skills, but not the skills needed to persuade, debate, or give oral presentations. Decoding may mask a lack of comprehension of complex text. Students get the main idea of lessons, but miss important technical details and nuances. The specialized scientific meaning of everyday words goes unperceived.

Science teachers play a pivotal role with ELLs, because these teachers can provide a language-rich environment where ELLs can create and express understandings. Regardless of changing policies and practices, it is indisputable that science instruction has a distinct place in the development of academic language. Effective science teachers view their educational practice within the context of the lives of their ELLs. Teaching demanding science content to ELLs differs from teaching an English proficient student, which suggests that reaching ELLs

involves approaches that go beyond "just good teaching."

Often overlooked in the articulation of quality science teaching is the affective domain so essential in making a positive connection with ELLs. Without that connection, standards-based content, high quality materials, and teacher preparation have little impact. One must also consider the perspective of ELLs in the science classroom and what affective factors encourage engagement.

If my experience as an ESL teacher is representative, then while trying to receive, interpret, and explain science content, ELLs frequently ask themselves a series of questions in their classrooms, questions that most classroom standards for teaching fail to address. For instance:

- Does this teacher know anything about me and about my background?
- Does this teacher care about me?
- Does this teacher want me to be successful?
- Does this teacher realize that I am not intellectually limited, even though I am not able to express myself completely in English?
- Does this teacher understand the feelings of ridicule and embarrassment I must overcome every time I open my mouth to speak in the classroom, participate in a group, or hand in my written work?
- Does this teacher see me as a potential contributor to scientific knowledge?

These are very real concerns of students who need to be assured and reassured that their teachers are aware of the issues behind each question and are willing to reach out to each ELL. Science teachers who are able to connect to these students are successful in communicating that students are not alone in their struggle to participate, that support is available, and that former ELLs have

succeeded in the science program. Equally important on the part of the instructors is the outward recognition that the ELL population is diverse. Instructors need to avoid making false, defeating assumptions about demanding science content knowledge, academic English, and the career goals and the futures of ELLs.

Whatever their level of expertise and history of commitment to ESL issues, each high school is challenged to rethink its services to ELLs, especially if it is an under-performing school, and include well-planned activities based on scientific research with theoretical underpinnings in their program designs. In my research, I focused on the following details as I completed my ethnographic study of three mainstream science classrooms:

1. The special challenges of scientific spoken and written discourse, and academic vocabulary that need to be included in instructional design.

2. Incrementally adding rigor to academic language as students progress to higher levels of English language development (ELD).

3. Assuring that specific needs of ELLs are systematically addressed, not just at the earliest stages, but until they have mastered the literary conventions of science and can communicate effectively within the discipline.

4. How district-adopted and supplementary materials can most effectively be used with ELLs.

5. Efficient and supportive ways to provide feedback to students on their written and oral work within the context of science instruction.

<div align="center">Research Purpose</div>

The purpose of the study was to investigate teacher knowledge and voice in collaboration between three high school science teachers who work with ELLS in their classrooms and a

university researcher who also teaches in the ESL department. This study engages the strand of research on teacher learning and knowledge that investigates the role of social and institutional context in teacher learning. This context includes both concrete and sociocultural factors: from the number of students and available materials to the values and ideologies that inform policies and practices. Secondly, this qualitative ethnographic study revealed how three teachers in U. S. public schools implement their versions of equality of educational opportunity. I also examined secondary science teachers' attitudes and perceptions of the inclusion of ELLs in mainstream, English-medium classes.

Site: Falcon View High School (FVHS)/Falcon View Freshman Campus (FVFC)

The school is located in a residential neighborhood. The 10$^{th}$-12$^{th}$-grade building is quite an imposing, sprawling complex consisting of an east and a west wing, field house, new football stadium, and Olympic size swimming pool. It houses approximately 2400 students. The 9$^{th}$ grade building is located across the parking lot and houses over 800 students. Falcon View High School/Falcon View Freshman Campus comprise one of the larger high schools in Michigan.

School demographics have changed drastically over the last 25 years. The school was once predominantly white, middle to upper class. The principal of Falcon View High School, at the time of this study, who is Caucasian, graduated from Falcon View High School in 1973, and is recognized for his leadership in the state. The principal of the Freshman Campus is a Caucasian female. Demographic changes have prompted administrators to take a closer look at how to engage minority students, because the district's minority population increased from 20% of students in 1994 to over 41% during the 2008-2009 school year. Of the approximately 8,489 students attending Falcon View Public Schools (K-12), 11% are English language learners (ELLs), with 975 ELLs enrolled in the school district.

According to test data, Falcon View's minority students perform better than their state counterparts, but the district has work to do to close the achievement gap between minority and white students. The district's African American students scored 20 percentage points behind Caucasian students on the Michigan Merit Exam (MME). Asian students were 10 percentage points behind Caucasians, while Hispanics were 18 percentage points behind the Caucasian group. Providing teachers and students with diversity training, complementing content with real-life experiences for students and providing meaningful parental participation are three of the ways the district is trying to reach out.

Falcon View's neighborhood proved amenable for resettlement of immigrants. Catholic Human Development Organization and Freedom Flight resettled Vietnamese refugees in the area after the fall of Saigon. Near Falcon View, an abundance of apartments and rental units and jobs existed, providing an ideal resettlement community. Since 1995, over 15,000 Bosnian refugees have resettled in the area. Burmese students from Myanmar represent the largest recent influx of refugees, with the majority of these students being unaccompanied minors. If the ELLs are minors, they are placed in foster care. The adult ELLs are placed in apartments and are expected to live independently, attend school, and obtain employment.

Refuge families differ in central ways from past residents. Many refugee families have three or more children. Approximately 25 to 30 % of the parents were able to complete a college degree in their native countries, but because of a lack of language proficiency are only able to obtain entry-level unskilled labor jobs. Resettlement agencies such as Bethany Christian Services and Lutheran Social Services help families for up to four months with rent, utilities, food, and medical care. They also help the parents register their children for school and advocate for them. Most of the refugee students receive free or reduced lunch and are eligible for ELL services.

Over 55% of the 8,489 students in the district receive free and reduced lunch.

Schools engage parents at Falcon View. Parent orientations and family nights are held in the media center and the cafeteria. It is convenient for using a projector and screen for a power point presentation in both areas. Also, it is centrally located and easy for parents and students to find. Parents are invited to attend the orientation and ELL family night in addition to the fall open house at the freshman campus and the 10th-12th-grade building. With the implementation of a trimester schedule, parents have three opportunities during the school year to attend conferences with their children's teachers.

The ELLs at Falcon View are a diverse group. There are over 975 ELL students receiving ELL services at Falcon View Public Schools. There are sixty countries and sixty-three languages represented in the ELL program. A majority of the ELLs are Burmese. Other students hail from countries as diverse as Rwanda, Liberia, Korea, Bhutan, Nepal, Congo, Ethiopia, Albania, Kosovo, Sudan, Somalia, Haiti, Mexico, Honduras, Guatemala, India, the Dominican Republic, Zaire, Puerto Rico, Peru, Ecuador, and Vietnam. ELL students are identified through a home language survey given to each student enrolling in Falcon View Public Schools. Once ELL students are identified, they are assessed using the English Language Proficiency Assessment (ELPA) in order to determine their proficiency in the domains of reading, writing, speaking, listening and comprehension. Based on the results of the test, they are either placed in the regular education program or are offered ELL services. The parents may also decline services and opt to mainstream their child. During the spring of April 2006, the English Language Proficiency Assessment (ELPA) was administered to the ELLs for the first time. Michigan has also developed a condensed version for screening and placement to administer when the ELL students are enrolled. Due to the new requirements for identification and placement of ELLs

within fifteen days of their enrollment, students must be screened and placed in the appropriate program.

An Office of Civil Rights (OCR) investigation of the ELL program filed on the behalf of ELLs and their parents found several areas of noncompliance, including identification and assessment of all students speaking a home language other than English, and not translating the student handbook, enrollment forms, attendance policy and school policies into the native language of the parents. The school district plan of improvement entailed monitoring the grades of the ELLs in regular education classes and the suspensions and expulsions of the ELLs. As a result of this mandate, the district hired additional staff, because the number of students served had doubled. In addition, a Title III audit highlighted several areas of noncompliance currently being addressed through increased staffing and in-service training in the Sheltered Instruction Observational Protocol (SIOP). An onsite Title III audit was held in April 2010.

The *No Child Left Behind Act of 2001* (Title I & Title III) requires states to establish an accountability system that includes the annual assessment of English language proficiency for English language learners (ELLs). State educational agencies (SEAs) are required to establish English language proficiency standards; identify or develop and implement English language proficiency assessments; and define annual measurable achievement objectives (AMAOs) for increasing and measuring the level of ELLs development and attainment of English proficiency.

Local educational agencies (LEAs) must assess ELLs in the five domains of listening, speaking, reading, writing, and comprehension. Comprehension can be demonstrated through reading and listening. For the measurement of reading comprehension, LEAs may report on a student's ability to read grade-level English texts with understanding. The measurement of listening comprehension includes the student's ability to understand and respond socially and

academically.  In addition, LEAs must report on the progress of ELLs, who have participated in Title III programs, in meeting State academic content and achievement standards for each of the two years after these children no longer receive services under Title III.

The annual assessment of English language proficiency is part of a system to evaluate the effectiveness of language instructional programs.  It is reported to the U.S. Department of Education at the end of each year as part of the Annual Measurable Achievement Objectives (AMAO) report.  These objectives are based on the English language proficiency standards and relate to ELLs' development and attainment of English language proficiency.

The U.S. Constitution guarantees equity of educational opportunity to all students regardless of race, creed, language, or cultural background.  This laudable goal has been difficult to achieve in practice and nowhere more so than in assessment, intervention, and placement and instructional procedures for ELL children.

Falcon View High School and Falcon View Freshman Campus serve English language learners speaking over 63 different languages, so they choose not to provide a comprehensive bilingual program. A sheltered English immersion program is implemented in the ELL classrooms. The principal at the Falcon View Freshman Campus has even mandated that the bilingual ELL teachers refrain from the use of the students' native language.

The nature of ELL language development and the length of time required developing peer-appropriate levels of conversational and academic skills have practical relevance for equity issues in assessment and instructional practices. Assessment of the ELL students' verbal, academic or cognitive abilities in English alone underestimates their academic potential to a very significant extent for at least five years after they start learning the language.  Studies have demonstrated that at least five to seven years and sometimes more time is typically required for

English language learners to attain grade norms on academic aspects of English proficiency.

Less than two years is typically required for English language learning students to attain peer-appropriate levels of proficiency in conversational aspects of their second language. There are two reasons why such major differences are found in the length of time required to attain peer-appropriate levels of conversational and academic skills. First, considerably less knowledge of language itself is required to function appropriately in interpersonal communicative situations than is required in academic situations. The social expectations of the learner and sensitivity to contextual and interpersonal cues (eye contact, facial expression, and intonation) greatly facilitate communication of meaning. These cues are largely absent in most academic situations that depend on literacy skills and manipulation of language for successful task completion. Second, native speakers of English are not standing still waiting for ELLs to catch up. A major goal of schooling for all children is to expand their ability to manipulate language in increasingly decontextualized situations. Every year, student's gain more sophisticated vocabulary and grammatical knowledge and increase their literacy skills. Thus, ELLs must catch up with a moving target. It is not surprising that this formidable task is seldom complete in one or two years.

Usually, children with little English very quickly become adept at using here-and-now contexts where interactions occur face-to-face and often relate directly to what is occurring in the immediate situation. However, as Cummins (1984, 1988, 1996, 2000) and others (Collier, 1989; McKay et al., 1997) have shown, children who appear fluent in English in such contexts may still have difficulties understanding and using registers associated with academic learning in school. At Falcon View High School/ and Falcon View Freshman Campus, ELLs that have been in the U.S. less than two years are allowed to receive high school credit for the Newcomers ESL

English class, the low-intermediate ELL English class or Read 180. Also, when they are placed in required classes outside of the ESL department such as math, science, business, social studies or physical education, the instructors assign the students no credit if students are unable to pass the course due to their ELL status and inability to meet the standards. The students receive credit or a letter grade providing they have completed all tests and assignments, met the standards, and participated fully in the class, illustrating how Falcon View's grading program is based on current research. Students who are mainstreamed have several opportunities to receive academic support during and after the school day, but there is no program in place for the ELL students once they complete the newcomers program. Once they attain the low intermediate level of proficiency, they are mainstreamed and monitored by a reading specialist without any background in ELL methodology or best practices based on scientific research. In addition, there are 2 ELL intervention specialists working in the ELL newcomers program who do not have a bilingual or ELL endorsement. They are monitoring the basic and low-intermediate students who are placed in required mainstream classes and electives.

There are ways in which mainstream subject-matter teachers can identify and teach discipline-specific language within subject-matter classrooms. It is helpful for subject-matter teachers to collaborate with ELL teachers to plan and provide instruction that keeps both curricular objectives and language objectives in mind (Kidd, 1996). Integrating language into content instruction in mainstream classrooms requires regular education teachers to be knowledgeable about academic language and conversational language use and to incorporate language objectives that are responsive to English language development in the lesson. Integrating modified language into content instruction is also very important. Modified language refers to the varied ways of making discipline-specific, academic vocabulary comprehensible for

ELLs. A biology teacher, for example, can use gestures, simplified descriptions, drawings, labs, and models to communicate the meaning of specific concepts and academic language.

Mainstream classes are becoming increasingly linguistically and culturally diverse. It is imperative that mainstream teachers sensitize their instruction to English language learners' backgrounds and needs and teach academic knowledge through language. With the implementation of tougher high school graduation standards and standardized achievement tests, mainstream teachers in secondary schools are increasingly wondering how they can effectively teach students with limited English language skills. As Hall (1998) points out, language learning does not depend only on students' abilities, or on their knowledge and skills or motivation for learning, but is "tied to the teacher's motivation for and interest in providing his/her individual learners' with 'official participatory rights' to engage fully in the opportunities for exhibiting and building on their knowledge and skills in their classroom practices" (p. 308).

The ELLS do have protection under the law. Justice Douglas, in the opinion, which he delivered for the U. S. Supreme Court in the case of *Lau v. Nichols*, declared, "There is no equality of treatment merely by providing students with the same facilities, textbooks, teachers and curriculum; for students who do not understand English are effectively foreclosed from any meaningful education." It also declares, "Imposition of a requirement that before a child can effectively participate in the educational program he must have already acquired these basic skills (referring to English Skills) is to make a mockery of public education" (*Lau v Nichols*, 1974).

*Lau v Nichols,* the Lau remedies, and the Equal Educational Opportunity Act (EEOA) of 1974 are unanimous in their call for equalization of educational opportunity for students of limited English proficiency. The EEOA asserts that educational institutions must "take

appropriate action to overcome language barriers that impede equal participation by its students."
Yet, the struggle to realize the objective continues in U.S. schools today, where approaches to
achieving equalized opportunity are characterized by "dueling philosophies" (Platt, Harper, &
Mendoza, 2003, p. 105) of inclusion and separation, universalism and differentiation. Thus, as I
detail in subsequent sections, the proposed research falls at the juncture of equal educational
opportunity, schooling for social justice (Gutmann, 1990; Howe, 1997), ELLs, literacy, and
science teaching.

CHAPTER 2: SCHOLARLY FRAMEWORK

As part of the research on teacher learning and knowledge, this study falls within the strand investigating the role of social and institutional context (Freeman, 2002, p. 1). The design of the study is informed by the movement within teacher education linking teacher research within social critique (Cochran-Smith & Lyle, 1993; Wideen, Mayer-Smith, & Moon, 1998). Projects within this movement draw on feminist and critical social theories to problematize concepts of teaching, research, and knowledge and articulate alternatives to the idea that teachers passively receive university-produced theory. Instead, researchers in this movement see teachers as active readers, users, and producers of theory.

The concepts of voice, context, and teacher knowledge and learning inform this study. Voice is conceptualized as "the individual's struggle to create and fashion meaning, assert standpoints, and negotiate with others. Voice permits participation in a social world" (Britzman, 1991, p.12). Teachers participate in educational reform and their knowledge and expertise must be recognized and included in the research base (Britzman, 1991; Cochran-Smith & Lyle, 1993; Duckworth, 1997; Elbaz, 1991; Freeman & Johnson, 1998; Hiebert, Gallimore, & Stigler, 2002).

Teacher learning is an ongoing process that spans teacher's careers (Freeman & Johnson, 1998) and is most productive when it is relevant to school initiatives and activities (Gonzalez & Darling-Hammond, 1997; Parsad, Lewis, & Farris, 2001). Although teachers possess a range of knowledge (Shulman, 1987), they must integrate rather than compartmentalize these categories as they negotiate the complex realities of their classrooms (Freeman & Johnson, 1998). Cochran-Smith and Lytle (1993) highlight knowledge for teaching as "inside/outside" to show that teaching does not occur in isolation. Rather, teachers, and learners are affected by the "relations of power that structure their daily work" (p.xi). The relations of power that I elude to include

how the mainstream community positions and (mis)understands the ESL community (students, teachers, and families). It seems always a case of "us" and "them." ELL teachers decide when and how to exit students to mainstream classes based on the students' language proficiency and what types of support and resources will be available to those students, including intangibles such as "ELL-friendly" mainstream teachers. Teachers question academic expectations made by administrators who ignore the variation in students' cultural, linguistic, and academic backgrounds and experiences. Students in the high school speak many different languages and include Liberian, Burundi, Burmese, and Somalian students who have had several years of schooling and are not print literate in their first language.

Teacher knowledge is generated by inquiry and is facilitated by learning communities. Teacher learning involves teachers and others engaged in critical inquiry into their experiences, beliefs, and assumptions, as well as policies and practices in schools and communities. The goal is not to produce findings but to "ultimately alter practice and social relationships in order to bring about fundamental change in classrooms, schools, districts, programs, and professional organizations" (Cochran-Smith & Lytle, 1999, p. 272). Teachers are capable of generating knowledge, theorizing their experiences, and acting as leaders and activists in schools and communities (Cochran-Smith & Lytle, 1993, 1999). Collaboration facilitates learning not only through its supportive function and bringing together a variety of experiences and perspectives, but it also challenges teachers to make their knowledge accessible to others (Hiebert et al., 2002).

Context is more than geographical location and the concrete factors that shape classroom practices (physical space, number of students, type of program, materials, etc.). It also encompasses the sociocultural and sociopolitical contexts, that is, the values and ideologies that inform the policies, practices, and interactions that shape teachers' work (Britzman, 1991;

Freeman, 2002; Freeman & Johnson, 1998).

For this study, context is conceptualized as a series of swirling concentric circles that represent the different layers of context that teachers work within and against (e.g., classroom, school, community, state, and nation). These layers overlap and interact in dynamic ways. How teachers identify, evaluate, interpret, negotiate, and contest these contextual layers holds valuable insights for teacher education. As Freeman and Johnson (1998) assert, "[Teachers'] learning processes can only be adequately documented and understood if the sociocultural contexts in which these processes take place are explicitly examined as part of the research process" (p. 407).

Teacher's lack of attendance and their lukewarm interest in training in strategies for working with ELLs can likely be attributed to a number of factors, including a troubled history of one-shot in-service programs (Guskey & Huberman, 1995). Clair's (1995) research, however, suggests that mainstream teachers may feel that no special training is necessary to work successfully with ELLs. This is reflected in the policies and practices of the administration at Falcon View High School. A majority of the teachers hired to work directly with the ELLs at the lowest level of proficiency are not appropriately certified to teach at the high school level. Only 2 teachers have bilingual and ESL endorsements at the secondary level. In addition, the ELL interventionists and coach have never taken an ELL methods class. They are the teachers that the administration has coaching the mainstream teachers on how to make adaptations to their curriculum and instruction. Teachers need to realize that the more diverse the students, the larger the variety of methods that should be used. It is imperative for teachers and administrators to understand and meet the challenge of diversity in their classrooms. The more diverse the student population, the more important it is for intervention to offer opportunities to apply what students

learn in a meaningful context (practice devoid of context is not meaningful).

Equal Educational Opportunity

Educational opportunity may best be described as a collection of opportunities extended to students throughout their enrollment in public schools. Kenneth Howe (1997) explains that "having and exercising an educational opportunity can be understood only within a context of choice, the features of which are determined by the interaction between individuals and social conditions" (p. 32). In spite of the situated nature of educational opportunities, attempts to define and measure opportunity must be undertaken to ensure that all students receive adequate and appropriate schooling.

Educational opportunity has largely been thought of in terms of equality of educational outcome, which in turn, has been measured primarily through equality in graduation rates, test scores, dropout rates, and college admittance. Equality of educational outcome, however, is not the sole measure of educational opportunity. Other indicators that have been used to gauge educational opportunity include universal access to school and equitable school financing. Each of these measures may indicate that some degree of educational opportunity has been achieved, but no single indicator can be held as proof that opportunity has been equalized. Universal access to schooling serves as an example.

Universal access to schooling is fundamental to the equalization of educational opportunity (Petronicolis & New, 1999). In spite of challenges such as Proposition 187, which would have barred undocumented children from public schools in California, access to school is virtually universal in the United States today (McGroarty, 2002). Access to schooling does not ensure that educational opportunity has been equalized. The disproportionate number of linguistically and culturally diverse students who fail in school, drop out, or get placed in low-

track special education classes suggests that merely having access to schooling is an inadequate measure of educational opportunity (National Center for Educational Statistics, 2003). "Having an opportunity merely to undergo X does not constitute a real opportunity, a good chance of success (but not necessarily a guarantee) must be present in order for real opportunity to exist" (Howe, 1997, p. 19). Educational opportunity can only be considered real if ELL students are also offered the means to obtain success and if educators are committed to democratic participation of all (Gutman, 1989; Young, 1990).

Two basic approaches to equalizing educational opportunity have dominated policy in the United States in the 20th century: differentiation and universalism (Howe, 1997). Differentiation matches schooling to student's individual needs, and universalism standardizes schooling to meet the needs of all of the students collectively. Although their strategies differ, the two approaches share the common objective of equalizing educational opportunity.

*Differentiation*

A differentiated approach to schooling provides instruction according to student's individual needs. "Persons who need educational resources cannot be said to have been treated with equity on receiving an equal share, when what is needed is a share equal to their need" (Gordon, 1999, p.46). In the case of ELLs, differentiated instruction is typically designed to raise students to grade level in language proficiency through programs such as ELL or transitional models of bilingual education. Historically, separation of the special needs population has accompanied differentiation (Platt et al., 2003). ELL students are placed in bilingual or ELL classrooms and special education students are enrolled in special education classrooms specific to their disability. There are, however, differentiated programs that occur inclusively, such as push-in ELL, where ELL specialists work with ELLs in the mainstream classroom or team teach

in a mainstream classroom. In addition, there are mainstream teachers who implement the SIOP Model in their classrooms.

Although the intent of differentiation is to equalize educational opportunity, critics point out that differentiated schooling has a history of failing to achieve parity for linguistically and culturally diverse students (Deschenes et al., 2001; Nieto 2002; Valdez, 2001; Watras, 2000). This deficit perspective is evident in some of the labels given to learners, labels that include "weaker members of society" (Gordon, 1999, p. 124) and "'underdogs' [who] compete against their more fortunate peers" (Fritzberg, 2000, p. 65) or limited English proficient LEP). From this perspective, learners from nondominant language and culture groups are viewed as requiring compensation for their faulty backgrounds. Differentiated instruction becomes a method for retraining students to better fit their schools, and students who have resisted retraining or who could not equip themselves quickly enough seem likely be blamed for their own, rather than their school's, failure (Deschenes et al.). Such students drop out, are pushed out through discipline and attendance referrals, or run out of time to graduate because of their age and a deficient program.

*Universalism*

*Universalism,* an approach identified by equal treatment of all students, has also received criticism for failing to equalize educational opportunity. Critics charge that universalism does not recognize important differences in students, in the schools in which they learn, and in the communities in which they live (Cooney & Akintunde, 1999; Deschenes et al., 2001; Larson & Ovando, 2001; McCarthy, 1995; McLaren, 1997; McNeil, 2000; Platt et al., 2003; Olsen, 1997; Sleeter, 1995). Blindness to these differences may perpetuate, even exacerbate, inequities. Some teachers assert that they see all of the students the same.

*Difference blindness* is an inclusive term Larson and Ovando (2001) use to expand *color*

*blindness,* which is a construct most commonly associated with refusal to recognize or signify racial and ethnic differences (Lewis, 2001; McLaren, 1997). Color blindness, Peter McLaren writes, "is a concept that *symmetrizes* relations of power and privilege and flattens them out so that they appear symmetrical or equivalent" (p. 13). In her ethnographic study of a California school, Laurie Olson (1997) met many color-blind teachers who denied seeing racial or ethnic differences. "I don't see color. None of us really do, we just see all our students as the same," stated one participant (p. 180). Larson and Ovando argue that educators can be blind to more than just color and for this study I adopted their use of difference blindness to include blindness in differences in culture, language, gender and class in addition to race and ethnicity.

In the ideology of difference blindness, a neutral image of students, free of social difference distinctions, is advanced in schools and other public institutions to ensure that everyone is treated equally, ergo fairly (Larson & Ovando, 2001; McLaren, 1997). Proponents argue that treating students equal in all aspects of education creates a color-free, difference-free environment, a level plane on which all students have equal access to educational opportunity. In other words, it is believed that "through color-blind practices, institutions can best avoid discriminatory policies and practices, protect equal rights, and ensure uniform access to entitlements" (Larson & Ovando, pp. 64-65). Universalism, as a difference-blind practice, is employed to "prevent inequity [and] bias" (p. 65).

The feasibility of universalism to enact equality, however, has been questioned, in large part because the approach presumes that differences have already been neutralized and that power differentials can no longer be linked to differences in class, gender, race, ethnicity, or language. Critical multiculturalists have argued this is simply not the case, that differences do matter and that schools and other public institutions, as sites of the (re)production of societal

hierarchies continue to striate and be striated by power differentials along social difference lines (Larson & Ovando. 2001; Lewis, 2001; McLaren, 1997; Olsen, 1997). Lewis, for example, found that a rhetoric of difference blindness merely "mask[ed] an underlying reality of racialized practice and color-conscious understanding" (p.799) in her yearlong study of an almost all white suburban elementary school. Although many administrators, educators, and students in Lewis's study insisted that differences did not matter, their actions and the school's policies and procedures belied this assertion.

The recent trend toward inclusive education for ELLs, in which students are rapidly mainstreamed out of ESL or bilingual courses, raises the question of whether equal treatment of ELLs through inclusion is an extension of difference-blind practice or a truly equitable way to equalize educational opportunity. Platt et al. (2003) caution, "If the school ignores the linguistic and cultural diversity that English language learners bring, then the goals of inclusive education are subverted" (p. 125). This suggests the first research question: What sorts of learning environments do these science teachers adopt, universalism or differentiation?

As the work of Lewis and other multiculturalists suggests, the equalization of educational opportunity requires an approach that neither assimilates nor structurally separates culturally and linguistically diverse students (Deschenes et al., 2001; Larson & Ovando, 2001; McLaren, 1997; Nieto, 2002; Platt et al., 2003; Sleeter, 1995; Valdez, 2001). Such an approach would "accept and affirm the pluralism (ethnic, racial, linguistic, religious, economic, and gender, among others) that students, their communities, and teachers reflect" (Nieto, p. 29). Thus, the proposed study focused on understanding how the school and classrooms incorporate equal educational opportunity. And this suggests the next two research questions: What sort of educational opportunity does the science classroom offer to ELLs? In addition, what steps, if any, do the

school and the science teachers take to equalize educational opportunity for ELLs?

English Language Learners

Falcon View High School and Falcon View Freshman Campus fit the profile of a school that tolerates language diversity, as described by Sonia Nieto (2002). Nieto proposes four levels of school support for diversity: tolerance, acceptance, respect, and affirmation, solidarity and critique. "The 'tolerant' school accepts differences but only if they can be modified. Thus, they are accepted but because the ultimate goal is assimilation, differences in language and culture are replaced as quickly as possible" (p. 262). A tolerant school, like Falcon View High School/Falcon View Freshman Campus, acknowledges the presence of diversity, but unlike a school at the fourth level-affirmation, solidarity, and critique-differences are not embraced or accepted as "legitimate vehicles for learning" (p. 269).

"Teaching remains among the least well compensated and [appreciated] of all professions," argues Sonia Nieto (2003, p.4). So, what keeps teachers fueled? She answers this question in her book *What Keeps Teachers Going?* by examining the work of the Boston Public School teachers' inquiry group. Nieto's purpose is to explain what keeps teachers dedicated despite the challenges, negative criticism, and the sometimes-overwhelming political mandates.

The book encompasses a wide range of themes. In "Teaching as Evolution," the first chapter, Nieto narrates her journey into teaching and examines the sociopolitical powers that influence the goals of education, helping readers understand why she wants to advance the education of the underprivileged in U.S. society. "Teaching as Love" suggests that classrooms often lack care, respect, and appreciation for students' identities. Nieto argues that without passion and love for students, effective teaching is not possible. "Teaching as Hope and Possibility" speaks to the meaning of courage as it relates to bringing about positive change in

students' lives, encouraging them to '[look] at [their lives] as they could be otherwise' (p. 53). In "Teaching as Anger and Desperation," Nieto suggests that these two emotions need not always be viewed as negative because they can spur "a deep caring for students, a hope for the future, and a vision of how it could be otherwise" (p. 74). "Teaching as Intellectual Work" emphasizes the constant learning, research, and community-building that good teaching requires. In "Teaching as Democratic Practice," she explores the issues of equality, social justice, and commitment in dealing with underprivileged and marginalized students, showing that teachers need to wrestle with the fact that teaching is a political act. "Teaching as Shaping Futures" demonstrates how teachers' words and beliefs shape the futures of students and beginning teachers.

Unfortunately, Nieto does not present explicit narratives of native-English-speaking and nonnative-English-speaking teachers working as ELL teachers. Including these narratives would more accurately represent teachers' diverse voices, especially when ELL educators are fighting an uphill battle regarding provisions of the No Child Left Behind Act (U.S. Department of Education, 2002) that assume all teachers and students come from a homogenous linguistic and cultural background.

The theoretical framework for the proposed research is based on Freire's (1985) and Vygotsky's (1978) critical sociocultural view of language and literacy. That is, that language and literacy are more than speaking, reading, and writing. Their development is affected by the world in which meaning is constructed, particularly by the larger social context of learning in the home, school, and classroom. Like O'Loughlin (1992), I believe that "each student possesses multiple frames of reference with which to construct knowledge by virtue of their ethnic background, race, class, gender, language usage, religious, cultural, and political identities" (p. 5).

In addition to the deficit view of linguistically and culturally diverse children that school personnel often unknowingly hold, critical pedagogy prompts educators to examine how the asymmetrical power relations of society are maintained and reproduced in schools (Anyon, 1998; Freire, 1985). There is a need for teachers of linguistically and culturally diverse children to critically reflect on the theories that guide their thinking and practices. Becoming a reflective teacher involves self-study, journal writing, and discussion. All are valuable because they help teachers thoughtfully analyze their own attitudes. As teachers inquire and reflect, they may find it worthwhile to keep a study journal in which they engage in critical pedagogy.

Engaging in critical pedagogy can help teachers to gain an understanding of the dynamics of diverse languages and cultures in their own lives, in children's lives, and in society (Beckett 1997). According to Freire (1985), all educational endeavors are inherently political. If teachers do not reflect and make themselves aware of oppression, they may be unaware that they are oppressing linguistically and culturally diverse children through a hidden curriculum in other insidious ways (Trueba & Zou, 1998). Meaningful contexts for learning have been inaccessible to children from culturally and linguistically diverse backgrounds, often contributing to their educational vulnerability. The monolithic culture transmitted by U.S. schools in the form of pedagogy, curricula, instruction, classroom configuration, and language dramatize the lack of fit between these students and the school experience. The histories, languages, experiences, and values of students from diverse linguistic and cultural backgrounds have been systematically excluded from classroom curricula and activities. "Tracking" limits access to academic courses and justifies learning environments that do not foster students' academic development, socialization, or perception of themselves as competent learners and language users. Often ELLs lack opportunities to engage in developmentally and culturally appropriate ways other than by

teacher-led instruction. Although the cultural norms and language experiences that diverse students bring to the class may differ from the mainstream, research indicates that teachers who consider students' home language and cultural experiences:

- Provide students with important cognitive and social foundations for learning English;

- Produce a positive academic difference (August & Garcia, 1988); and

- Promote student's participation and positive interpersonal relations in the classroom (Au & Kawakima, 1994; Trueba & Wright, 1992).

In addition, I frame my study in the theories of Cummins as they relate to language acquisition, policy, and practice. When teachers treat students' cultural and linguistic knowledge as a resource rather than as a deficit, students are more able to access the curriculum (Cummins, 2000; Valenzuela, 1999). The more comprehensive the use of their home language, the greater the potential for students from diverse linguistic and cultural backgrounds to be academically successful (Miramontes, Nadeau, & Commins, 1997). Learning is enhanced when it occurs in contexts that are culturally, linguistically, and cognitively meaningful and relevant to the students (Cole, 1996; Diaz, Moll, & Mehan, 1986; Heath, 1986; Moll, 2001; Scribner & Cole, 1981; Wertsch, 1985). It is through their first languages and home cultures that students create frameworks for new understandings.

<div align="center">Mainstream Science Teachers</div>

The two processes of literacy and science inquiry are mutually supportive. The role of text in support of scientific inquiry, for example, serves the function of not only delivering content, but modeling scientific reasoning (Glynn & Muth, 1994; Palincsar & Magnusson, 2000). In addition, by writing about science, students can clarify their thinking while learning the discourse of science (Rivard, 1994; Rowell, 1997; Shepardson & Britsch, 1997). This promising

pedagogy has thus far not adequately considered how this approach could benefit the fastest growing and, in many cases, most vulnerable sector of school-age population, English language learners.

Successful communication with students is essential to effective teaching. From a constructivist perspective, learning occurs when students build understanding by integrating prior knowledge with new information. Theoretically, teaching and learning environments that serve students well recognize that students have been constructing knowledge and are continuing to do so, both in and out of school. In the case of ELLs, this means building a learning environment that incorporates already constructed knowledge, including their first language and cultural values, in home and community environments (Garcia, 1999; Tharp & Gallimore, 1988). This theory of how the mind works implies that continual revisions are to be expected. When teachers organize teaching and learning environments, ideally they recognize the relevance to their goals of students' previous educational environments. Language and culture, and the values that accompany them, are constructed in both home and community environments. This approach acknowledges that children come to school with constructed knowledge about many things, and points out that children's development and learning are best understood as the interactions of past and present linguistic, socio-cultural, and cognitive constructions. Development and learning are enhanced when they occur in contexts that are socio-culturally, linguistically, and cognitively meaningful for the learner.

Students bring to the science classroom ways of looking at the world that are formed by their personal environments (Driver, Asko, Leac, Mortmer, & Scott, 1994). Students from diverse cultural and linguistic backgrounds have acquired everyday knowledge and primary discourse in their homes and communities, while they also learn science disciplines and

discourse in school. To provide effective science instruction, teachers face the challenges to ensure that diverse students, who may have acquired diverse worldviews and had varied experiences, have access to and opportunities for acquiring the nature of science disciplines as practiced in the school community and school science.

Science, as generally taught in school, has been defined in terms of Western tradition (American Association for the Advancement of Science, 1989, 1993; National Research Council, 1996) and yet tends to be regarded as "culture free" and not as a culturally and socially constructed discipline (Banks, 1993; Peterson & Barnes, 1996). Many assumed that all students would learn science when provided the opportunity. However, critics from a diversity perspective have raised epistemological and pedagogical concerns about the nature of science, learning, and teaching as traditionally defined in the science community and school science.

Standardized test scores in science indicate significant gaps among ethnolinguistic groups. A small body of research currently exists on promoting science learning and achievement among students from culturally and linguistically diverse backgrounds. More research is needed if the goal of "science for all" emphasized in current science education reform is to become a reality. Because the science practices in the U.S. school contexts reflect the thinking of Western Society, the norms and values of science are most familiar to students from the mainstream middle-class (Eisenhart, Finkel, & Marion, 1996; Lee & Fradd, 1998).

Limited English proficiency and diverse cultural perspectives should not prevent diverse students from engaging in meaningful science inquiry or from participating in formal and informal classroom participation. To be responsive to the cultural and linguistic diversity of students it is imperative to probe what students bring to the learning context. Learning science is dependent on students' ability to comprehend and communicate concepts and understandings

(Lee & Fradd, 1998). To promote science learning and achievement for culturally and linguistically diverse students, educators need to develop a pedagogy merging subject-specific and diverse-oriented approaches (Lee, 2002).

Part of the resistance to focusing on reading and writing in science education is rooted in the premise that science should be hands-on and not focused on the mediums through which these activities are often conducted. This resistance can have particular effects for ELLs who are highly dependent on: a) text as a source of linguistic input (Wong-Fillmore & Snow, 2000); and b) writing in English to attain feedback on their language abilities (Cummins, 2002).

The genre of the science notebook text scaffolds both student and teacher's use of the text in an inquiry fashion by including and drawing attention to such text features as tables, figures and diagrams. Diagrams can be used to depict the arrangement of the investigation materials; data in the form of figures to make sense of the data and tables used to display the multiple ways data can be displayed. Such visual features of texts have been identified as key strategies in assisting ELLs to gain access to important concepts since these schematic representations provide conceptual clarity for information that is abstract and difficult to grasp (Echevarria, Vogt, & Short, 2004).

Though reading and writing can play an influential role in the learning of science for mainstream students, ELLs face the challenge of learning English in addition to science concepts and literacy. This problem requires instruction to not only underscore key science understandings, the literacy needed to attain and communicate these understandings but also teach the type of English needed to function in the discourse of science-academic English. Wong-Fillmore & Snow (2000) identified elements of the type of English needed by ELLs to thrive academically in mainstream classrooms. Wong-Fillmore and Snow (2000) classify the

following key elements of academic English that students should be able to perform in the content areas:

1. Recognize ungrammatical and infelicitous usage in written language, and make necessary corrections to texts in grammar, punctuation, and capitalization;

2. Use grammatical devices for combining sentences into concise and more effective new ones and use various devices to combine sentences into coherent and cohesive texts;

3. Compose and write an extended, reasoned text, which is well-developed and supported with evidence and details.

The synergy between literacy and science appears to present ELLs with an opportunity to acquire academic language proficiency. Instruction needs to demystify the type of language required to function in the discourse of science. And this suggests the fourth major research question: To what extent does the teaching of science at Falcon View take ELLs, literacy, and science content seriously?

In this study I investigate to what extent ELLs benefit from science instruction that has embedded within it opportunities to write about their hands-on science experiences. The research framework's foci are on responsive instructional engagement that encourages students to construct and reconstruct meaning and to seek reinterpretations and augmentation to past knowledge regarding literacy and science within compatible and nurturing schooling contexts. Here, diversity is perceived and acted upon as a resource for teaching and learning instead of a problem.

CHAPTER 3: METHODOLOGY

Research Questions

1.  What sort of learning environment do these science teachers adopt- universalism or differentiation?

2.  What sort of educational opportunity does the science classroom offer to ELLs?

3.  What steps, if any, do the school and the science teachers take to equalize educational opportunity for ELLs?

4.  To what extent does the teaching of science at Falcon View take ELLs, literacy, and science content seriously?

Ethnography

Since I have confidence in critical approaches (LeCompte & Schensul, 1997, p. 60), I employed my research skills with the overall goal of building communities for academic success for all students. Careful and continuous inquiry into the impact of educational reforms on linguistically and culturally diverse students is critical to ensuring that ELLs do not become the "predictable losers" (Sack, 2000, p. 6) in the push to equalize educational opportunity. Thus, I entered the study site with the view that I might be instrumental in implementing change (p. 56). To understand how the experience of inclusion of ELLs in mainstream science classrooms was "created and given meaning" (Denzin & Lincoln, 1994, p. 4) by each participant, I spent a marking period (twelve weeks) with three mainstream science teachers at Falcon View High School.

Ethnography means writing about the culture of groups of people. Ethnography is described by LeCompte and Schensul (1997) as an approach to learning about the social and cultural life of communities, institutions, and other settings that is scientific, investigative, uses

the researcher as the primary tool of data collection, uses rigorous methods and data collection techniques in order to avoid bias and ensure accuracy of data, emphasizes and builds on the perspectives of the people in the research setting, and is inductive, building local theories for testing and adapting them for use locally and elsewhere. " Ethnography takes the position that human behavior and the ways in which people construct and make meaning of their worlds and their lives are highly variable and locally specific" (LeCompte & Schensul, 1997, p. 1).

The basic tools of ethnography use the researcher's eyes and ears as the primary modes for collection of data. Ethnography paints a picture of a group of people going about their lives and it addresses the following: "beliefs; attitudes; perceptions; emotions; verbal and nonverbal means of communication; social networks; behaviors of the group of individuals with friends, family, associates, fellow workers, and colleagues; use of tools; technology and manufacture of materials and artifacts; and patterned use of space and time" (LeCompte & Schensul, 1997, p.4). LeCompte and Schensul (p. 9) outline seven characteristics that mark a study as ethnographic:

- It is carried out in a natural setting, not in a laboratory.

- It involves intimate, face-to-face interaction with participants.

- It presents an accurate reflection of participants' perspectives and behaviors.

- It uses inductive, interactive, and recursive data collection and analytic strategies to build cultural theories.

- It uses multiple data sources, including both quantitative and qualitative data.

- It frames all human behavior and belief within a sociopolitical and historical context.

- It uses the concept of culture as a lens through which to interpret results.

Culture consists of the beliefs, behaviors, norms, attitudes, social arrangements, and

forms of expression that create a describable pattern in the lives of members of a community or institution. In addition, culture consists of group patterns of behavior which persist over time (LeCompte & Schensul, 1997). When ethnographers study other cultures, they deal with what people do, what people know, and the things people make and use. When these three fundamental aspects of human experience are learned and shared by members of a group, they are spoken of as cultural behavior, cultural knowledge, and cultural artifacts (Spradley, 1980, p.5).

Culture can be conceptualized and defined differently depending on one's world view and one's particular needs as a researcher. Eisenhart (2001) has noted that "increasingly, this is the case in educational research, too, where culture may mean one thing to bilingual educators, another thing to educational anthropologists and something else to ethnic scholars or cognitive psychologists" (p. 16).

## Teacher Participants

The three teacher participants for the qualitative inquiry were recruited from a pool of all teachers whose science courses are scheduled to enroll ELLs during the school year. All three teachers were white native English speakers (NESs) with limited L2 (second language) learning experience. All three teachers studied French or Spanish in high school or college, but none of the teachers feel that they were more than beginning-level L2 speakers.

## Participant Observer

As a full time teacher in a building very similar to Falcon View High School, I describe myself as a complete participant because I understand the policies and guidelines for the workplace and I also understand my job as an ELL and bilingual teacher and what is expected of me. I am familiar with the school site and personnel because I work as an ELL teacher and I have

team-taught two of the mainstream science classes. The school is on a trimester schedule; five 70-minute classes are taught five days a week. It makes sense to use the participant observer method since it is the subtlest way for me to record the activities without drawing too much attention to myself. The students that I know come from my ELL classes or have exited the ELL program. I have met all of the parents and guardians involved in the parent orientations and attending parent teacher conferences. I had to ask myself some questions such as "What would be the value of observing in this group?" or "Can I be objective?" "What kind of information will I obtain in this study that can be used to further understanding and collaboration of the parties being studied?"

"Stakeholders are people who have a vested interest in ensuring that the results of the research are used to solve the problem the research is addressing" (LeCompte & Schensul, 1997, Vol.1, p.13). Spradley cautions researchers by saying, "The more you know about a situation as an ordinary participant, the more difficult it is to study it as an ethnographer" (p.61). The issues that I considered included: describing the behavior of the participants in spite of my own sense of their world, separating data from interpretation, being sensitive in my own interpretation of events, and reminding myself that I am performing this study with the purpose of examining and understanding practices in mainstream science classrooms. I also considered availability, accessibility and the duration of the marking period before making a decision about the site.

The data and findings reported came from a study of three secondary teacher's attitudes about and perceptions of the inclusion of ELLs in mainstream, English-only medium Science classrooms. This study engaged the strand of research on teacher learning and knowledge that investigates the role of social and institutional context in teacher learning. This context included both concrete and sociocultural factors: from the number of students and available materials to

the values and ideologies that inform policies and practices. The contextual layers that the three mainstream science teachers traverse included research from first and second language acquisition, national educational reforms, federal funding in public schools, school ELL programs, and student's needs. Extensive description of the context became integral to the analysis (Creswell, 1998).

My role as a complete participant observer researcher (Spradley, 1980), required that I maintain a balance between observer and participant-facilitator. My position, questions, and interpretations reflected a particular perspective and are influenced by my own negotiation of the social contexts that I work in and against. I spent time in three teacher's classrooms gathering detailed information on their experiences with ELLs through nine individual interviews, a survey of the teachers in the building, one focus group interview, and five classroom observations in each of the three classrooms, field notes, and document collection. Data and findings discussed in the dissertation were drawn primarily from my work with three science teachers involved in the qualitative inquiry.

Data Collection

According to Spradley (1980), an ethnographic record consists of field notes (condensed and expanded), interviews, tape recordings, pictures, and artifacts (things used or produced in the classroom). The varied sources facilitated data triangulation. One of the goals was to have an ethnographic record that reflected the same differences in language usage as the field site. It was important to distinguish in the field notes between native and observer terms.

*Field Notes*

I wrote field notes by hand, and then typed them up. Given my uninitiated status in participant observation, I performed my first observations as a passive participant. Spradley

(1980, p. 59) defines a passive participant as one "present at the scene of the action but [who] does not participate or interact with other people to any great extent." Although I had been a participant in the team teaching of one of the science classes, I sat to the side and observed events broadly to avoid what Spradley calls system overload (1980, p. 57).

Making an ethnographic record was the next step in the process. I observed each of the three mainstream science teacher five times during the twelve-week marking period. The duration of each observation was 45 to 50 minutes. After each observation, expanded-account field notes, the bulk of the written record, were typed from the abbreviated hand-written notes taken during the observation, keeping in mind to identify speakers and their language, to make a verbatim record of what people say, and to use concrete language (Spradley,1980, p. 70). Recording and reporting of observed behavior emerged in a behavioral manner (Schensul, Schensul & LeCompte, 1999, p. 115). The goal was to describe behavior without including an interpretation so that the behaviors could speak for themselves. This researcher refrained from giving the actions meaning until discovering what particular behaviors communicated to others.

In any classroom, teachers and students hear and produce language against an extensive background of accumulated meanings, which researchers are in danger of ignoring if data are collected on single visits. A sociocultural perspective demands a "holistic qualitative methodology" (Ohta, 2000, p. 53) that can explain learning processes as they occur in interactive settings. Focusing on a sequence of lessons was necessary to avoid inaccurate observations. Some science lessons consisted entirely of students carrying out experiments in small groups whereas in other lessons the teacher took a major role in initiating talk. Observing one or another of these lessons might have lead to a conclusion that the classroom was teacher fronted and teacher directed or, conversely, that it was totally student centered. Neither lesson alone would

have provided a sense of what teachers were doing nor how knowledge and language were being progressively built up. By observing the classrooms over a sustained period of time, I observed how the teachers handled all stages of learning.

From there the researcher goes on to make a descriptive observation. The descriptive question matrix developed by Spradley (1980, pp. 82-83) is a very useful guide to help the researcher avoid missing any of the ethnographic data. The matrix helps the researcher to start with description of the physical space and end with the feelings associated with everything else that has been observed.

"Making an introspective record of fieldwork enables a person to take into account personal biases and feelings, to understand their influences on the research" (Spradley, p. 72). I wrote a few paragraphs in a reflexive journal on a daily basis. My journal mimicked a diary and contained a record of my ideas, experiences, fears, mistakes, confusions, breakthroughs, and problems that arose during my fieldwork. It included my reaction to informants and feelings I sensed from others. While doing my domain analysis, and striving to understand insider's viewpoints, I regarded my analysis and journal as an important check on my interpretations of events taking precedence over insiders'.

*Individual Interviews*

I interviewed and remained in contact with the participants over the course of the trimester, but limited my observations of their classrooms to five classes and one group of students. I conducted three formal interviews with each of the three science teachers. Before observations began, I completed interviews with each of the three teachers. The interviews lasted for 30 minutes and were guided by a set of questions designed to elicit information about teachers' experiences with ELLs, their attitudes toward inclusion of ELLs in their classrooms,

and the accommodations, if any, they used or planed to use with ELLs.

Individual interviews with science teachers followed a semi-structured interview guide (Appendix A). Here, I asked teachers about their teaching background, and then focused on their experiences teaching English Language Learners, as well as their preparation and suggestions about teaching ELL students. All interviews were later transcribed for analysis. The first interview was followed by weekly classroom observations during which I scripted the dialogue of the teachers and students, taking particular note of interactions that involved ELLs. I also collected worksheets, tests, rubrics, and other documents that teachers distributed to students during classes. These were analyzed for modifications, or lack of modifications, made by the teachers for ELLs. Following each observation I spoke with teacher participants for a few minutes, took notes on their reaction to the lesson and asked questions that arose from the observation. "It is not necessary to interview many key informants to obtain a large amount of information about a subject; however at this stage of the research it is necessary to find key informants who are well informed, therefore considered cultural experts or consultants" (Schensul & LeCompte, Vol. 2, p.123).

The second formal interviews were conducted after the third classroom observations. In these interviews, I asked questions about the classroom practices I observed, clarified information gathered in the first interview, and invited participants to share other information or feelings they had regarding the inclusion of ELLs in their mainstream classes. Cycles of interviews and observations continued until the end of the marking period. After the fifth observations, I conducted the third formal interviews.

*Focused Group Interviews*

I conducted a formal focus group interview with the three mainstream science teachers

after all of my classroom observations were complete. The focus group interview lasted approximately 40 minutes. My intention was to probe teachers' values and behaviors, and to clarify cultural domains and data collected in my five classroom observations and three previous formal interviews (Appendix B). A focused group interview is a group interview held between a researcher and more than one other person. It may be formal or informal, prearranged, or take place in a natural setting, guided by the facilitator, using more or less open-ended questions. "The purpose of focus group research is to identify important issues, domains for further investigation, meanings, values, opinions, behaviors, and explanations for cultural or physical phenomena" (Schensul, LeCompte, Nastasi, and Borgatti, 1999, p. 71). They are useful for:

- Orienting oneself to a new field of study.

- Generating hypothesis based on informant's insights.

- Evaluating different research sites or study populations.

- Developing individual questions for interview schedules and questionnaires.

- Obtaining participants' interpretations of results gathered in earlier research studies.
  (p. 52)

Group interviews generate a larger quantity of data in a brief amount of time. They allow the researcher to record and analyze the reactions of group members to ideas and each other and their interaction produces unique data and insights. The elicitation of "natural language discourse" allows the researcher to learn idiomatic expressions, common terminology, and communication patterns in the community being studied (p. 52).

A formal focused group interview tends to be planned and scheduled in advance. The average interview takes from 45 minutes to no more than 1 ½ hours and involves five to 15 individuals. An incentive is always offered to the participants to compensate them for their time

and information. Before focus groups are used, the researcher must give careful thought to why data should be collected in a group format, what kind of data are needed, and under what circumstances, by whom, and how the data will be used. Schensul, LeCompte, Nastasi, and Borgatti suggest that group discussions should focus on the relationship between target populations and a single cultural domain (pp. 62-63).

Three important factors influence choice of the target population:

1. The purpose of the study

2. Whom the study is intended to help

3. For whom the information generated from the study is intended (p. 64)

A number of researchers suggest that ethnographers must conduct at least two focus groups for each variable to ensure that they capture most aspects related to the subject of inquiry (Khan, Patel, & Hemlatha, 1990). The focus group interviewer needs to have good group facilitation skills. Interviews are often conducted in multilingual, cross-cultural, or cross-national settings. Appropriate questions in the participants' language, which align with their cultural beliefs and practices and their developmental stage, should be constructed. The facilitator has several key responsibilities. She or he must:

- Keep the discussion on topic.

- Ensure that the topics being addressed in the group are culturally acceptable for the majority of the group members.

- Help individuals in the group to avoid extremely personal disclosures that they might regret later.

- Make sure the focus group is not a therapy group.

- Make sure that every participant in the group has an opportunity to speak as well as to

listen. (p. 83)

Facilitators need a partner to take notes using a computer, notebook, newsprint (or flipchart or whiteboard), audiotape recorder, or video camera. They can use techniques such as probes, related statements, or statements such as "Can you explain a little more about what you mean?" "Can you define a term you just used?" or "Could you give an example of what you mean?"

At the beginning of the interview the facilitator needs to explain to participants why they have been invited, the purpose of the discussion and why they are important to the project. The roles of the facilitator and recorder(s) also should be explained. Permission to audio or videotape should be obtained and everyone should introduce himself or herself. Ground rules for the discussion are presented:

- Everyone should participate.

- All ideas are equally valid.

- There are no right or wrong answers.

- Each person's view should be heard and respected. (p. 83).

For a 90-minute interview, five to seven questions are sufficient. In addition to the core questions, probes and additional questions to help clarify or elaborate on participants' responses should be used. In planning the focused group interview, I came up with eight questions and they are more than enough to ask in 40 minutes. I also came up with four probes. "The open-ended questions used in focus groups should not be vague, leading, or misleading" (p.91). Elicitation techniques are used to stimulate group dialogue. Freelisting of cultural domains can provoke interesting ethnographic data on whether or not items belong to a domain. Group sorting generates data regarding similarities and differences in the way that items in cultural domains are grouped. The researcher can receive immediate corroboration and an immediate componential

analysis. The reliability and validity of the data depend on the researcher's knowledge of the participants and the context in which they live. The data collected should be analyzed and considered in relation to other data. Triangulation is achieved through corroboration of results from one kind of data by results obtained through collection of a different type of data.

<div align="center">Analytic and Descriptive Research Analysis</div>

LeCompte and Schensul (1997, Vol. 1 p. 149) state, "Ethnographers need to engage in several levels of analysis as they go along, because doing so helps them to make sense of what they are observing." While it is true that at a certain point one has to stop collecting data and actually do something with it, continuous analysis helps the ethnographer to see patterns and ask different questions as the patterns arise. Spradley outlines three different types of analysis: domain, taxonomic, and componential. A domain analysis helps the researcher discover the cultural scene from the social situation, a taxonomic analysis looks at how those cultural domains are organized, and a componential analysis looks for attributes in each domain (Spradley, 1980, p. 87).

*Domain Analysis*

The first analysis strategy that I learned is the Domain Analysis. In order to move on and describe the cultural behavior, the cultural artifacts, and the cultural knowledge, I had to discover the patterns of sameness that exist in my data. Ethnographic analysis involved searching through my fieldnotes to discover cultural patterns. "A cultural domain is a category of cultural meanings that includes other smaller categories" (Spradley, p. 88). Cultural domains are categories of meaning. Domains, as cultural categories, are made up of a cover term, included terms, and semantic relationship. "The third element in all cultural domains is a single semantic relationship, the linking together of two categories" (Spradley, 1980, p. 89). The steps that I

followed were (Spradley, 1980, pp. 98-99):

1. Selecting a single semantic relationship.

2. Preparing a domain analysis worksheet.

3. Selecting a sample of fieldnote entries.

4. Searching for possible cover terms that appropriately fit the semantic relationship.

5. Repeating the search with other semantic relationships.

6. Making a list of all identified domains.

When making domain analyses it was necessary to repeat the procedure as new data were collected through participant observation and interviews. The process I chose ensured thoroughness and an exhaustive search for semantic relationships.

*Taxonomic Analysis*

A taxonomy is a set of categories organized on the basis of a single semantic relationship, but compared to the domain analysis shows more of the connections among all the included terms inside a cultural domain (Spradley, 1980, pp.112-113). Spradley (1980) delineated seven steps in a taxonomic analysis (pp. 116-119):

1. Select a domain for taxonomic analysis.

2. Look for similarities based on the same semantic relationship.

3. Look for additional included terms.

4. Search for larger, more inclusive domains that might include as a subset the domain you are analyzing.

5. Construct a tentative taxonomy.

6. Make a focused observation to check out your analysis.

7. Construct a completed taxonomy.

A taxonomy was constructed to represent each domain that emerged (Spradley, 1980, p.121). In a complete and prolonged study, researchers move back and forth doing domain and taxonomic analyses until focused observations answer some specific questions. Domains were gathered across all data sources, and then organized within large domains (sub domains) and relative to one another. The taxonomy provided the structure from which the dissertation findings were written.

*Componential Analysis*

The domain analysis provides the springboard for a componential analysis that helps the researcher discover areas of contrast in a study. The componential analysis included a process of searching for contrasts, sorting them out, grouping them together as dimensions of contrast, and entering all of the information into a paradigm (Spradley, 1980, p.133). Spradley (pp. 133-139) listed eight steps for completing a componential analysis:

1. Select a domain for analysis.

2. Inventory all contrasts previously discovered, beginning with notes made from asking contrast questions and making selective observations.

3. Prepare a paradigm worksheet.

4. Identify dimensions of contrast that have binary values. A dimension of contrast is an idea or concept that has at least two parts.

5. Combine closely related dimensions of contrast into ones that have multiple values.

6. Prepare contrast questions for missing attributes.

7. Conduct selective observations to discover missing information

8. Prepare a completed paradigm.

In analyzing the data, I also used a framework similar to Hatch's (2002) model for

interpretive analysis. First, I read the data from all sources (transcripts, observations, field notes, and documents) to get a "sense of the whole" (Hatch, p. 181). On subsequent readings I recorded my impressions, noting "regularities" (Huberman & Miles, 1994, p. 431) in and between data sources, and developed preliminary interpretations. To ensure the "trustworthiness" of salient interpretations, I continued data collection to saturation when irregularities appeared consistently in multiple data sources (Glesne, 1999, p. 150). As a final measure of trustworthiness, I conducted a form of member check by sharing a draft summary of my interpretations with participants and asked for their feedback.

## Trustworthiness

Here, I outline the key elements of trustworthiness to detail how I ensured the quality of research findings. Lincoln and Guba (1985) described techniques "whereby the naturalist's alternative trustworthiness criteria may be operationalized" (p. 301). Trustworthiness comes via five key elements: credibility, transferability, dependability, confirmability, and neutrality via a reflexive journal. Each of these five elements contributes to making a study trustworthy.

Credibility is the most important element in qualitative research and also the most time consuming. In order to be credible, researchers must base their findings on prolonged, persistent and varied (triangulated) observations. In triangulation, researchers make use of multiple and different sources, methods, investigators, and theories to provide corroborating evidence (Lincoln and Guba, 1985). Peer debriefing allows a venue where findings are discussed with a knowledgeable colleague to provide additional insights into research processes and emergent findings. Peer review or debriefing provides an external check of the research process. Lincoln and Guba (1985) define the role of the peer debriefer as a "devil's advocate," an individual who keeps the researcher honest; asks hard questions about methods, meanings, and interpretations;

and provides the researcher with the opportunity for catharsis by sympathetically listening to the researcher's feelings. A negative case analysis (looking for evidence in the data that contradicts preliminary conclusions) assured that what is being studied is observable and cannot be explained in other ways. The researcher refines working hypotheses as the inquiry advances in light of negative or disconfirming evidence. Careful re-readings of data provided the negative case analysis for this study. The researcher also should include member checks to give research participants an opportunity to refine research findings adding elements to refine analysis, though the researcher's more comprehensive viewpoint may provide insights not available to insiders.

Transferability, dependability, and confirmability also add to trustworthiness. Transferability describes how widely a study's results can be applied to other similar situations. Knowing if a study pertains to another site can only be determined by a reader. The researcher must include a rich, thick description of the setting, and all elements and steps within the research process for readers to form their own judgments about transferability. Dependability for qualitative research emerges from an inquiry audit. The inquiry audit requires the researcher to maintain detailed records of the research process and to cross-reference findings with the data collected and researcher journal. Then, a qualified researcher should be able to trace all citations and data on which results were based back to the original data source. Confirmability deals with an audit trail and the audit process. An audit is done of the research process to ensure it was systematic and thoughtful. The researcher must be able to lead the auditor through all the steps taken during the project. This process confirms the findings.

The final element of credibility comes from the reflexive journal the researcher keeps throughout the study. The journal contains a record of experiences, ideas, fears, mistakes, confusions, breakthroughs, and problems that arise during fieldwork. Noting patterns that emerge

provides a basis for open-ended exploratory questions used in interviews.

To make the study trustworthy, I developed credibility in a variety of ways: prolonged engagement, persistent observation, triangulation, and member checks. In the field I built trust with participants, learned the culture, and checked for misinformation (Lincoln & Guba). I observed five times in each of the three classrooms over a period of twelve weeks and conducted three formal interviews with each teacher. This data was further triangulated via the focus group with 3 high school science teachers, and a survey of ninth-grade teachers. After developing preliminary findings, I performed a negative case analysis through repeated readings of data to rule out competing explanations. I used the third interview with teachers, and the focused group interview to conduct member checks of preliminary findings.

CHAPTER 4: FINDINGS

Helen established a question-seeking routine in her 10th-12th-grade ELL Biology class composed entirely of English language learners. They were all at the low-intermediate level of proficiency based on the ELPA. She firmly believes that science learning begins with questions and analysis and that ELLs are as capable of thinking deeply about science topics as any other students are.

In Helen's class, students' questions often drive the lesson. She challenges them with higher-order thinking in her questioning. In her opinion, there are no "stupid" questions. Even a basic comprehension question can lead the ELL to inquire. What is crucial is generating questions, hypothesizing, and discussing the questions. According to Helen, this is an invaluable part of learning how to think about science.

For example, in a discussion about the food chain and how animals adapt to the environment, the word *gemsbok* came up.

Biak: "What are gemsboks? They talk about gemsboks on this page, but I don't know what they are."

Teacher: "Let me read the paragraph. (*She reads it*.) You're right, Biak. It talks about the lions eating the gemsbok, but what are gemsboks? I have no clue! Does anyone know what a gemsbok is?"

Marly: "Maybe it's a large animal."

Teacher: "How large?"

Marly: (*She indicates something about 5 feet long with her hands*.)

Shabani: "Maybe it's a lizard."

Biak: "Maybe it's in the picture on this page?"

Teacher: "Let's look in the chapter."

Mu Chi: "Well, I think it has to be a big animal."

Teacher: "Why?"

Mu Chi: "The paragraph says that if the gemsboks were no longer living, the lions would go hungry. I know that lions are large animals, so they must eat large animals. I think the lions would go hungry if they didn't eat big animals because big animals provide more food."

Teacher: "I believe you are correct. Does everyone agree?"

Using the question about the gemsbok as the focal point of the discussion, Helen invited students to hypothesize and think about their own answers. She taught them not to settle for simple answers. She encouraged them not only to ask questions but also to give justification for their answers, consequently developing a habit of active learning and thinking.

Helen's feedback is interesting. Her responses issued an invitation for open discussion and placed the teacher as one of the learners. By acknowledging the student's question about gemsboks and listening to students' responses without explicitly evaluating those responses; she placed student voice at the center of the discussion. Moreover, students had time to pose hypotheses, think about their responses, read the passage aloud, and examine the pictures in the text. This approach led to higher-level responses.

Teachers can help ELLs break through the initial language barrier by nurturing a community in which students believe that their ideas matter, by tapping into students' prior knowledge, and by providing context-rich language resources. Breaking through the language barrier is not the final goal of such instruction.

Mainstream content area teachers have the responsibility of moving beyond teaching basic language and literacy skills to gaining access to students' ideas and making them discernible in the classroom. By encouraging English language learners to compare, question, discuss, confirm, and reflect on their own and others' ideas, teachers promote higher-order thinking skills and create active readers and writers.

Falcon View split students into two campuses, one for freshman (Falcon View Freshman Campus) and one for the remainder of high school students (Falcon View High School). This study surveyed teachers at the Freshman Campus, as well as followed three teachers closely at the High School.

Falcon View Freshman Campus

The 37 Falcon View Freshman Campus teachers seemed under-trained for their work with a growing corps of English Language Learners (ELLs) (Appendix C). All 37 competed a brief survey about their background. They teach a variety of subject areas: 6 Biology, 5 Math, 5 English/Language Arts, 4 Social Studies, 3 Fine Arts/Music, 3 World Languages, 3 Elective, 2 Business, 2 Physical Education/Health, 2 Special Education, 1 Vocational, and 1 ELL. These 16 men and 21 women teachers are all first-language English speakers, with from one to 37 years of experience (13.7 years on average). Of these teachers eleven speak a foreign language (2 beginners, 4 intermediates, 5 advanced). Only seven teachers have received training related to ELLs, with 32 teachers interested in receiving more, and 34 having ELL students in their

classrooms. Thus, in Falcon View Freshman Center (FVFC), one ELL-qualified teacher was assigned to teach 67 ELL students, whose capabilities range from none to basic (30 students), to low intermediate (14), to high/P1 intermediate (23) (Appendix D). In fact, numbers of students per ELL-qualified teacher declined from elementary to Falcon View Freshman Campus and High School (Appendix D, caseload data). For instance, teachers reported being responsible for from 90 to 137 teachers each. Feeder schools for these two settings, elementary (grades k-5) and middles school (grades 6-8) served a remarkably language-diverse set of students (Appendix E). Table 1 details the most common languages in elementary versus middle plus high school settings:

Table 1: Prevalence of languages spoken by ELL students

| Language | Elementary | Middle & High Schools |
|---|---|---|
| Spanish | 190 | 38 |
| Vietnamese | 179 | 21 |
| Bosnian | 84 | 10 |
| Arabic | 34 | 1 |
| Myanmar Dialects* | 32 | 25 |
| Somali | 19 | 3 |

* Myanmar dialects are not necessarily mutually understood.

At the time of the study, Spanish, Vietnamese, and Bosnian predominated among the over 40 languages students spoke at home.

Falcon Valley High School - Three Teacher's Science Classrooms

As will become evident in what follows, the three science teachers participating in the study, fell into a common groove at Falcon View, a school-wide tendency to consider a policy of equal treatment, or sameness of treatment, as an adequate way to provide equality of educational opportunity to ELLs. In fact, such a philosophy of difference blindness actually created inequalities in at least two ways, in the three classes that I observed: restricted access to course content and inaccurate assessment and grading. In spite of all three teachers acknowledging

inequalities in assessment and grading, they believed that the situation was temporary and tolerable. Their notion of equal educational opportunity is only accessible through English, yet they thought equal treatment was the most effective approach for equalizing opportunity. Contra a growing body of scholarship about ELLs, participants believed that treating ELLs as if they were literate in English – that is in the same way they treated first-language English speakers – was thought to speed up acquisition of English. In such a school, ELLs faced being normalized through linguistic assimilation if they were to take advantage of educational opportunities at Falcon View High School, clearly a culture of blindness to differences through difference erasure. However, as findings below substantiate, these three participating teachers' expressed unresolved tensions about their teaching practices, though these concerns varied by degree across participants.

All three science teachers concurred that they faced several challenges in educating ELLs: (a) lack of funding, (b) students having different academic levels and English proficiency levels, (c) lack of materials and lab equipment, (d) lack of bilingual science teachers, (e) lack of sheltered instruction training, (f) lack of support from all levels, (g) lack of time to help all students, and (h) challenges with student discipline. In addition, they struggled with the questions:

1. How do we know that students understand the teacher?

2. How much time will it take to teach all the required standards?

3. What books or materials do we use?

4. Why do we use the books and materials we have?

5. Can we use other books?

6. Do we write all of our questions on the board?

7. Are all grades or grade point average (GPA) equal in other school districts with high concentrations of ELLs?

Like most teachers at Falcon View, none of the three teachers in the study had received in-service training to work with ELLs. As my analysis progressed, it became clear that the teachers' conceptual framework of best instructional practices and effective English language acquisition overlapped and interacted with the concept of equal treatment and equal educational opportunity. In what follows, I describe each science teacher in turn, beginning with Charles.

*Charles' classroom and ELL teaching*

For Charles, making accommodations for ELLs in grading was necessary because equal opportunity for all students was the only way to guarantee success. He criticized teachers who thought making accommodations for ELLs were unfair, explaining that it takes more time and effort to make modifications and make the curriculum comprehensible. In Charles' opinion, giving ELLs special consideration was a temporary fix. He explained that "some teachers find it easier to just give the ELL student the answer than explain it to them. In my opinion, the student gets cheated" (Interview, June, 2007). He realized that ELLs might have to put in more time and effort than English proficient peers in order to complete coursework, but he did not lessen the quantity or quality of work for ELLs. "If a student has something to read in the textbook that is in English, then they may have to wade through it for eight hours to get it. That's just what they're going to have to do" (Interview, June, 2007). Charles was not unsympathetic to the challenges faced by ELLs and realized that in order to achieve in an English-medium class a student must devote much more time and effort. According to Charles,

Students must get the idea that science is based on questions and investigations to take an idea, a product, or a process and make it better for human kind. Students must learn the

scientific method and how it applies to biology, physics, chemistry and ecology. (Interview, June, 2007)

…I realize that you run the risk of frustrating the student, but it seems to me it would be frustrating functioning in a society where you don't know the language anyway, so you better get it over with while you are in school rather than later. (Interview, June, 2007)

Charles viewed his classroom as a practice field for life and for education beyond Falcon View. He viewed himself as a facilitator and coach. ELLs would not be given preferential treatment after graduation from high school; therefore, they should not be given special treatment in high school. ELLs had to be able to function as English proficient students. Charles made no alteration in curriculum, instruction, or assessment for ELLs. Charles explained, "I want all of my students to function on a level playing field" (Interview, June, 2007). An essential aspect of that level plane, in his view, was to be a proficient English speaker. "It's not like you are going to wear a badge that says 'English is not my first language. Be patient'" (Interview, June, 2007). He encouraged ELL students to use English in his classroom and to limit the use of their native language to asking an English-proficient peer for clarification. But, all ELL students were allowed to use L1 dictionaries and electronic translators during instruction and assessment.

Charles was opposed, in principle, to allowing ELLs to continue using their native languages in his classes at Falcon View or in their homes, because he believed that L1 use slowed English acquisition and adjustment to life in the United States.

I've told my students they should speak English. I said, 'You should be teaching your mom English.' It drives me crazy. You came to America because you wanted to be here, and once you learn English then you can function in the society that you wanted to be a part of in the first place. (Interview, June, 2007)

Charles' staunch resistance to accommodations was put to the test when his Biology class enrolled Felix, a Honduran immigrant at a basic level of English proficiency. As the trimester progressed, Felix fell "so profoundly behind" (Interview, June, 2007) in Charles' opinion, that despite his reluctance to allow any accommodations, he granted extra time and access to the computer program at home. Charles was uncomfortable with continuing the equal treatment approach with Felix and at the same time very reluctant to allow any accommodations.

Charles struggled with the school administrations' non-response to challenges teachers encountered when ELLs were included in mainstream Biology courses. He recommended that ELL students should be placed in biology classrooms only when they reached an intermediate level of English proficiency. Charles suggested that rather than placing ELLs in mainstream classes, ELLs should be placed in the newcomers' classroom until they reached a level of English proficiency that would make mainstreaming possible.

Thus, overwhelmingly, Charles thought of his teaching responsibilities as limited to learners who spoke enough English to succeed without Charles changing his teaching. Helen's approach varied only slightly.

*Helen's classroom and ELL teaching*

Helen completed her student teaching at Falcon View High School before being hired as a full time biology teacher in the science department. In addition, she had also worked as a paraprofessional in the ELL classroom during the semester following her student teaching at Falcon View Freshman Campus. Helen reported that she enjoyed having ELLs in her classroom and she described them as "hardworking and conscientious" (Interview, June, 2007).

In terms of coursework expectations, Helen treated her ELLs and English proficient students "equally." All of the students were required to complete the same quality and quantity

of coursework. "ELLs might take a little longer than the English proficient students, but I want them to do it like everybody else" (Interview, June, 2007). To meet the standards, Helen anticipated that the ELLs would have to work harder and invest much more time and effort. Her prediction was accurate; throughout the semester, Helen observed that the ELLs put in more effort than most of their English proficient peers. She empathized with the ELLs' challenge of learning English and content at the same time. Throughout the trimester, Helen remained committed to maintaining equal standards in the biology coursework quantity and quality for all of her students. " They're still required to do the work everybody else does. Just like this assignment for them is hard, but they're still required to do that" (Interview, June, 2007).

> Students come to your classroom thinking that all must be given to them. The teacher must train the student to become an independent student responsible for their daily work. The teacher must train the students to bring writing utensils and to have a notebook. (Interview, June, 2007)

Though Helen was aware that her English-only classroom was an environment that might not be ideal for students with limited English language proficiency, she did not modify the language she used, and she did not slow down the pace of her instruction. She provided some individual attention to the ELLs at the end of the class period, when Helen was able to assist the ELLs with their work. However, other students competed for Helen's attention and this left little time for one-on-one assistance for ELLs.

Helen made few accommodations to equalize opportunities for success in her biology classroom between mainstream students and ELLs. Helen provided study guides and discussed the content of the test with the entire class, but allowed ELL students more time to complete coursework and tests, the use of the (English language) textbook, and the use of their L1

dictionary, items mainstream students were never allowed to use.

> On a test for regular students, I would never let them use the book, because I've discussed the content of the test, they've understood what I've said, they've got things to read. The ELLs may not get everything I say, so when they take the test, to be fair to them, they use the book. They also take as much time as they need. (Interview, June, 2007)

Thus, overall, Helen believed that making accommodations did not conflict with equality of treatment, because all of the students were required to complete the same work. But, she understood that assessing an ELL student in the same way as an English proficient student would not provide an accurate measure of their knowledge of the course content.

> My goals for the ELLs are to master as many of the standards as possible. I think it would be idealistic to think that they would be proficient in everything that we did like everybody else. I don't know how that would be possible. There are clearly things that the ELLs will miss. (Interview, June, 2007)

Ultimately, accommodations Helen provided during assessment could not compensate fully for lack of English proficiency. But, Helen believed that assessing mainstream and ELLs in the same way and by the same standards was the only way to ensure equality; that is, ELLs would have to endure lower grades until they became more proficient in English. Stephanie, however, provided more support for ELLs in her science classroom, as the next section details.

*Stephanie's classroom and ELL teaching*

Stephanie believed that some differentiation was necessary when working with ELLs in order for them to have access to the content of their biology class. As a whole, she modified her instruction and made numerous accommodations for ELLs. Stephanie allowed ELLs more time

to complete coursework, the use of a L1 dictionary or electronic translator, and the use of the textbook on all coursework. Stephanie made modifications in the usage of language in some of her worksheets and exams/tests by using synonyms for words and phrases or expressions that she anticipated that the ELLs would struggle with. Stephanie was willing to grade the ELL students using credit or no credit.

In spite of Stephanie's belief that some differentiation in instruction was necessary, she was unsure if her accommodations were effective. Her frustration was that there was not a way to accurately assess the ELLs' knowledge in English.  She believed that if the students did not perform well on an assessment that it was the assessment itself that was flawed. Stephanie regretted the fact that the ELLs' L1 could not be used in instruction and assessment in order to give a more accurate measure of their mastery of the content standards.

> If the kids can't read, and they can't do basic math, they're going to have a hard time in science…. We have a real challenge with the reading levels of many ELL students and their math skills. More schools are encouraging science teachers to work on English as they teach science. Teachers need to work on vocabulary and reading skills as they cover scientific topics. Science sometimes becomes a poor stepchild in relation to the two other subjects. (Interview, June 2007).

But Stephanie lacked clarity about what expectations she should hold for the ELLs. In fact, she believed that the school's administration had not made grading policies clear. She also questioned whether holding the same expectations for ELLs and an English proficient student was realistic. Giving ELL students a modified grade caused her discomfort, because she knew this could negatively affect ELLs' chances for acceptance to college.

Summary

Charles, Helen, and Stephanie each recognized that educational opportunity at Falcon View was only accessible through English acquisition, and Falcon View advanced a policy of equal educational treatment both implicitly and explicitly. District leadership that seemed to leave teachers to their own devices proved alternately consistent with, but also inharmonious with, teachers' beliefs about and approaches to teaching ELLs. Teaching ELLs at Falcon View High left these three science teachers with conflicted views about educating ELLs. For instance, teachers had day-to-day assessment information that clearly demonstrated that equal treatment produced (perpetuated) inequality. But, simultaneously, they could recite an equal-treatment-as-equality rhetoric as if such equal treatment would equalize educational opportunity. Here, teachers could hold conflicting views without having to resolve them.

Each of these teachers struggled to decide if accommodations for ELLs proved appropriate and effective to implement, even as they were aware that ELLs had restricted access to the curriculum in their biology classrooms. All three teachers recognized inequalities when ELLs were treated like everyone else, principally limiting ELLs' access to the curriculum and the inaccuracy of grading and assessment. Teaching ELLs under these circumstances frustrated the three science teachers, because they had limited experience with ELLs, no training to work with ELLs, and no guidance from the school administration about accommodating ELLs.

Unfamiliar with other models for teaching ELL students, the science teachers in this study equated differentiation and accommodation with the dissolution of curricular standards. Ultimately, these teachers believed that holding ELLs accountable to the same high standards as English proficient students was synonymous with providing ELL students access to equal educational opportunity. In this view, making accommodations tended to mean undercutting both

standards and equal educational opportunity. But, although they all believed accommodations threatened high standards, these teachers made some accommodations for ELL students.

Teachers' accommodations fell into three domains: curricular, instructional, and procedural. Curricular modifications represent qualitative and quantitative modifications to the curriculum and include lessening the amount of the coursework, or simplifying the difficulty of the coursework. This sort of accommodation rarely occurred. Instructional accommodations modify the delivery of the content and include altering speech or texts for comprehensibility by slowing the rate of speech or adapting or supplementing materials, something one teacher did sparsely. Procedural accommodations modify the procedures of the classroom and include extending due dates or allowing ELLs the use of L1 dictionaries and electronic translators, which all three teachers incorporated. These three categories of accommodations reflect the kinds of modifications participants discussed or used.

Participating teachers used accommodations with varying degrees of frequency. Charles was much less willing to make accommodations. His exception was his limited use of procedural accommodation for his low-proficiency ELLs. Helen and Stephanie used procedural accommodations for ELLs and allowed ELLs extra time, and the use of L1 dictionaries or electronic translators. Helen and Stephanie also made some instructional accommodations, infrequently and cautiously. Helen chose not to make curricular accommodations, but Stephanie on occasion lessened the quantity of work for the ELLs. All of the teachers questioned the effectiveness of making instructional and procedural accommodations for ELLs. Stephanie stated that ELL students have to know the information for the exam, feeling she could not condense the amount of factual information needed for mastery.

Ultimately, all three teachers struggled to find effective and appropriate accommodations,

which resulted in very few accommodations except at the procedural level. ELL students in these teachers' classrooms had to learn in English like first-language speakers with minimal curricular or instructional accommodations. Teachers realized that standard assessments failed to demonstrate the content knowledge of the ELLs; yet, Stephanie was the only teacher who attempted to modify her method of assessment. Charles, Helen, and Stephanie did not attribute the ELLs' poor assessment scores to lack of academic ability, but to lack of English proficiency. The three teachers did not feel comfortable with the ELLs' test scores, but recognized that their grades and test scores would not be valid until the ELL students became proficient in English.

Adapting teaching to the needs of English language learners (ELL) can be difficult even for veteran teachers. This is especially the case for adolescent English language learners when they are a heterogeneous population. Teaching requires that teachers craft education plans that address all students' needs; but, this did not always happen for ELL students in the classrooms taught by the three participating teachers. As detailed in Chapter 5, models of inclusive teaching for ELLs exist and have been proven effective, and I discuss sheltered instruction, specially designed academic instruction (SDAI) in English, a cognitive academic language learning approach, and sheltered instruction observational protocol (SIOP) in the hopes that teachers will develop effective practices for ELLs via linguistically appropriate instruction, while maintaining curricular standards.

CHAPTER 5: IMPLICATIONS

During observations in mainstream science classrooms, I sat in on a Falcon View High School class consisting of a majority of ELLs, many of whom tested at the basic and low-intermediate level of English proficiency. The teacher had many scientific vocabulary words posted on the walls, used visuals and conceptual models to illustrate concepts, and used copious amounts of vocabulary to scaffold the science learning. I was in the back of the room observing and taking notes about whether the teachers are applying best practices. Placed in the back of the classroom was an ELL student, flipping the pages of his science textbook and scribbling in his notebook, totally oblivious to the activity at the whiteboard. When I asked the teacher what he was supposed to be doing, the teacher replied "Oh yeah, that's Mohamed. He came from Somalia a few months ago. He doesn't speak any English." This statement seemed out of step with education policy, such as *No Child Left Behind*. In fact, in the classroom being observed, I wondered if Mohamed would even reach the education starting gate, much less achieve at levels needed for life in the U.S. As I shared this story with other ELL teachers, it became painfully obvious that others have had similar experiences with a one-size-fits-all mentality used to educate adolescent English learners in mainstream classrooms. In this chapter, I return to the issue of teacher responsibilities and suggest other teaching practices that have proven effective for adolescent ELL students.

Educating ELL Students in a No Child Left Behind World

Whether adolescent ELLs are citizens, residents, or undocumented individuals, *Plyler v. Doe* (1984) ensures their right to an education if they meet the age limits determined in state education codes. However, in high schools across the United States, including Falcon View High School, it seems that 16- to 20-year-old immigrants who seek to attend school are discouraged

from enrolling and instead are referred to adult literacy and GED programs offering far fewer hours of schooling. ELL students are often advised they cannot complete all of the requirements of the Michigan Merit Curriculum in order to receive a high school diploma.

The lack of enthusiasm for serving these students is unfortunate, but understandable under *The No Child Left Behind Act of 2001* (NCLB). Public schools find they have little to gain and much to lose by enrolling older adolescents who speak little or no English. NCLB requires that after one year of enrollment, ELLs must take all statewide assessments, with these results integrated into each school's accountability measures. Enrolling large numbers of adolescent ELLs might put a school at risk of failing to make adequate yearly progress, because ELL students must take the Michigan Merit Exam (MME), for instance, after earning 15 credits (about two years of study), before English proficiency and content knowledge matches test expectations. Colleagues describe cases where administrators find ways around such requirements, such as one who redesignated all students at the 11th-grade ELL newcomer/basic level as 10th-graders, to prevent their taking the MME until the following year. Thus, in times of increasingly meager resources, when schools are paring down to essential programs and making contingency plans for state budget cuts and federal program funding reductions, adolescent ELLs are sometimes viewed as an unwelcome presence in schools, and a drain on the limited resources available. And, the challenge of educating ELLs is compounded when immigrant adolescents enter secondary schools knowing little or no English, having interrupted or limited formal schooling, and possessing limited literacy in any language.

Nonetheless, each year the United States becomes more ethnically and linguistically diverse, with over 90 percent of recent immigrants coming from non-English speaking countries (Echevarria, 2004). Schools mirror that trend and students from non-English speaking

backgrounds represent the fastest growing subset of the K-12 student population. Over 5.5 million school-age children are English language learners (Echevarria & Short, 2005b). Michigan has the highest percentage of speakers of Arabic, Macedonian, and Syriac in the U.S. (English Foundation, 2005), and six counties include over fifty different spoken languages. Language diversity in Wayne, Oakland, and Kent counties rivals that of some of the highest recorded in the country. As the student population in Michigan and the U. S. become more diverse, providing effective instruction for them becomes more complex. But, as the example of this study's teachers suggests, teachers need preparation for such complexities.

As Falcon View's students' experiences demonstrate, meeting the instructional needs of increasing number of ELLs presents a challenge that requires thoughtful and deliberate attention, since the academic achievement of these students tends to lag significantly behind that of their language majority peers. Lower grades, poor state and national standardized test scores, and high dropout rates characterize many ELL students (Echevarria, 2004). On top of trying to meet high academic standards, ELL students face the added challenges of learning, comprehending and applying the academic English through which teachers and textbooks deliver important information. It seems only reasonable to expect those who teach these students to take their special language learning needs into consideration (Echevarria & Short, 2005a). These circumstances lobby for educational institutions' rethinking approaches to equalizing educational opportunity. And, I argue that educational institutions need to be challenged to reinvision educational practices to serve ELL students. In particular, this means better ensuring teachers understand a variety of ways to support ELL students. One important finding from the results of this study relates to teachers' challenges in and practices for developing academic language in mainstream science classroom. The science teachers report that they are less prepared to meet the

academic language needs of their students than they are to meet the academic or content-area needs of their students.

Part of the complexity of educating ELL students is that they differ in dramatic ways. They come from different cultures, different levels of native (L1) and English proficiency and have varying amounts of formal schooling, but they do share common needs. For instance, all students need high-quality instruction that will make a difference in their learning (Learning First, 1998). All students benefit from having teachers who understand and are sensitive to their linguistic, as well as, content needs. All students profit from instruction with rich and meaningful lessons that are carefully scaffolded, supporting each students' needs. Clearly, teachers need to know what makes lessons understandable or comprehensible to all learners, especially ELLs. In what follows, I suggest three approaches that offer effective teaching strategies for ELL students: bilingual education, sheltered instruction, and sheltered instruction observational protocol (SIOP).

*Bilingual Education*

Some students have the opportunity to be supported in their language learning with transitional bilingual programs. Bilingual education programs typically introduce content right away and teach subject matter in English as soon as it can be made comprehensible. Bilingual programs also develop literacy in students' native language and teach subject matter in that language in the early stages (Krashen, 2005). The programs strive to stimulate intellectual development in the first language so children do not lose academic ground as they transition to instruction in English. At times, it is not feasible to offer bilingual programming. Accordingly, a "next best" placement must be made. In schools without bilingual or dual language programs, "sheltered" instructional practices help make English comprehensible and accessible for ELLs.

In schools wishing to offer a continuum of services from bilingual to mainstream, sheltered instruction offers an opportunity for the gradual progression of English language development along the path to English literacy.

*Sheltered ELL Instruction*

Sheltered instruction implies "an approach for teaching content to English language learners in strategic ways that make the subject matter concepts comprehensible while promoting the students' English language development" (Echevarria, 2005b). For science teachers of students who are learning English, "shelter" comes with two goals in mind: to help students increase their proficiency in the English language and to ensure they have access to grade level science content by making information understandable (Rich, 2001). To ensure ELLs have sufficient scaffolding or "sheltering," science teachers must know and understand strategies that yield high levels of learning and promote literacy and language in English (Dang, 2005). The development of a model for Sheltered Instruction (SI) is one key to improving the academic success of ELLs. "Pre-service teachers need to develop a strong foundation in sheltered instruction; practicing teachers need it to strengthen their lesson planning and delivery and to provide students with more consistent instruction; site-based supervisors need it to train and evaluate teachers" (Echevarria, 2004), such as sheltered instruction observational protocol (SIOP) model.

*Sheltered Instruction Observational Protocol (SIOP)*

The SIOP model is grounded in a content-based learning approach and has its underpinnings in second language acquisition theory. Theoretical groundings include (a) development of literacy skills, (b) standards based instruction, (c) second language acquisition theory, and (d) use of native language and transfer skills (Short, 2004). Content understanding

and language acquisition are both enhanced through meaningful use and application (Echevarria, 2005b). SIOP was developed by researchers at the Center for Research on Education, Diversity, and Excellence in response to the variability, both in design and delivery, of sheltered instruction methods (NWREL, 2003). The model is composed of 30 instructional strategies grouped in eight specific features: 1) preparation, 2) building background, 3) comprehensible input, 4) strategies, 5) interaction, 6) practice/application, 7) lesson delivery, and 8) review and assessment. Using the core curriculum, SIOP teachers modify their teaching to make the content comprehensible for ELLs (Echevarria, 2004).

Lesson preparation

SIOP begins with *lesson preparation*. Here, instructors teach with a specific plan or objective to guide the lesson to a successful end result for all students. Content objectives closely align with district and state standards and benchmarks. These objectives are paced with an eye on complexity, new learning, and student background to determine a reasonable amount of objectives per lesson. Apart from the content objectives, language objectives are also planned for every lesson.

The three science teachers in the study should incorporate both language and content objectives in their lessons. The spring ELPA scores and reports are available to staff, students, and parents by the end of August and are essential information in guiding planning and instruction. The lessons require a focus on oral language development, vocabulary, reading comprehension strategies, and writing skills. Use of the Michigan English Language Proficiency Standards is invaluable in determining appropriate lesson objectives. It is crucial for mainstream teachers to familiarize themselves with the ELL standards. The mainstream science teachers also can learn to evaluate their curriculum from a language perspective, asking:

1) What aspects of language will students need in order to be successful in a particular lesson or unit?

2) Will they need to give an oral presentation?

3) Do they need to compare and contrast two texts?

These common tasks require facility with academic language and content-specific structures being taught and practiced.

When lesson objectives are understood and articulated for students, science teachers need to add supplementary materials to make cognitively demanding tasks accessible to all students. Examples of supplementary materials may include hands-on materials, objects from the real world (realia), visuals, demonstrations, and multimedia presentations. Charles and Helen used power point presentations often in presenting materials. They printed out notes and could have added visuals to assist the students in making connections. Laboratory experiments and creation of models make the content comprehensible. In fact, many supplementary materials support reading for all students.

"Scaffolding reading experiences helps English language learners master both reading and content" (Fitzgerald, 2005). A scaffolded reading experience (SRE) specifically involves text and might involve a number of supplementary materials. Sheltering could be in the form of preview, view, and review activities with the grade-level biology textbooks, those adopted for ELLs that include less and easier text, but comparable content concepts and adaptations of content through the use of graphic organizers, outlines, highlighted texts, marginal notes, or adapted text. SRE breaks down the complexity of a reading task, and allows ELLs access to information presented.

Building background

*Building background* is the second key feature of the SIOP model. Because many ELLs may lack background knowledge in certain topics, consistent review of previous lessons allows teachers to activate any knowledge that students bring to the lesson (Echevarria & Goldenberg, 1999). By linking new learning to students' personal experiences or past learning, science teachers have the opportunity to assess background knowledge, promote oral language development, and create opportunities to enhance student thinking through knowledge links. "Effective teaching takes students from where they are and leads them to a higher level or understanding" (Vygotsky, 1978). Ultimately, effective science teachers make explicit connections between new learning and material, vocabulary, and concepts previously learned in school. These learning links greatly enrich students' schema and help create a more complete "picture" of an idea (Moats, 2004). All three science teachers should use posters, word walls, and conceptual models in their classrooms.

An important aspect of building background is scaffolding vocabulary instruction. Vocabulary development is critical for ELLs, because of links "… between vocabulary knowledge in English and academic achievement" (Beck, 2002; Saville-Troike, 1984). By directly explaining the meanings of words along with thought-provoking, playful, and interactive follow-up, vocabulary instruction becomes active, personalized, rich, and repetitious. Careful attention should be paid when assisting students with strategies to determine word meaning independently. Personal dictionaries, word walls, concept definition maps, cloze structures (comprehending text when words are intentionally deleted), and the vocabulary self-collection strategy are examples of tools that help make school language comprehensible to ELLs (Echevarria at al., 2004). The use of mind maps for comparing and contrasting and cloze

activities are strategies Stephanie could use in her classroom in order to teach new vocabulary and concepts. All three teachers identified academic language for reading, writing, and science, and a lack of exposure to English as challenges they face in addressing the language and academic development of their ELLs.

Comprehensible input

*Comprehensible input*, the third feature of the SIOP model, occurs when teachers deliberately make verbal communication more understandable to students with diverse linguistic needs via language modifications (Echevarria et al., 2004). Avoiding jargon and idiomatic speech are techniques that help maintain clear messages for students. Appropriate speech – rate, enunciation and complexity –considers students' levels of English proficiency. Paraphrasing and repetition prove useful techniques. Using gestures, movements, pictures, and objects also assists students in making sense of information that is presented verbally. Although modifying language adds time to examine teacher talk, to enunciate clearly and avoid jargon, slang, and lengthy monologues, it does not mean avoiding age-appropriate language or specific content area terminology (Wallace, 2002), because SIOP teachers do not dilute curriculum or lower academic expectations for ELLs. This was the fear of the three science teachers in the study. They did not modify their speech because they did not want to lower their expectations. Many of the ELLs in the teachers' classrooms expressed their frustration because of the teachers' rate of speech and their use of idiomatic expressions. Instead, the teachers should use an array of techniques to facilitate understanding and model student expectations.

Thinking strategies

Explicitly teaching *thinking strategies*, the fourth feature of SIOP, facilitates learning processes. Helping students connect what they are learning to what they already know, assisting

them in solving problems, and promoting retention of new learning involves accessing information in memory. Thinking strategies (also called learning strategies) are "special thoughts or behaviors that individuals use to help them comprehend, learn, or retain new information" (O'Malley & Pierce, 1996). These thinking/learning strategies refer to metacognitive, cognitive, and social or affective strategies, which relate to ELL standards and can be aligned to the Michigan English Language Proficiency Standards. Several techniques lend themselves to assisting in the "memory" portion of language learning, such as think-alouds, mnemonics, questioning, predicting, monitoring, and clarifying (see also, Cunningham, 2000). These strategies need to be explicitly taught in the science classroom.

Interaction

*Interaction* is another important feature in the SIOP model. Opportunities to use language new ways and situations prove central to language acquisition. Communication requires interaction and negotiation. Here teachers provide a welcoming space where ELLs can share their thoughts, ideas, and information throughout the day within a variety of grouping structures (Widowson, 1998). In heterogeneous groups non-native English speakers work side by side with native-English speaking students, and afford ELL students' practice opportunities, scaffolding, and support in their new language. Instructional grouping might include individual work, partners, triads, small groups, and whole group instruction (Echevarria et al., 2004). Grouping promotes developing the support structures needed in ELL classrooms where students might otherwise feel stranded and without assistance (Cunningham, 2000).

Practice

*Practice* form the next key factor in the SIOP model. Much of what humans learn to do comes from practice, as is the case for sports, musicians, avid readers, and artists. Although all

students benefit from guided practice, English learners tend to make more rapid progress when provided with multiple opportunities to practice with hands-on materials and manipulatives. "For students acquiring a new language, the need to apply new information is critically important because discussing and doing make abstract concepts concrete" (Echevarria et al., 2004). As important as hands-on learning is to understanding lesson content, opportunities to discuss and interact before, during, and after a lesson are equally important in promoting language development. In addition to increasing competency in both language and content, "interaction supports self confidence, risk taking, and a greater sense of belonging" (Rich, 2001).

Lesson delivery

Thus, according to the SIOP model, *lesson delivery* proves critically important to a lesson (Echevarria et al., 2004). The effectiveness of a lesson's delivery refers to how well the content and language objectives are communicated and supported during a lesson, the level of student engagement, and the pace of the lesson relative to students' ability levels. Both content and language objectives are established and clearly articulated to students in comprehensible terms during a lesson's delivery. "Effective SIOP teachers need to plan to use the entire class period efficiently, teach in ways that engage students, and make sure students are engaged in activities that specifically relate to the material on which they will be assessed" (Echevarria et al., 2004). All students benefit when teachers deliver lessons geared to specific objectives, teachers stay on task, and learners remain focused.

Review and assessment

The final feature of the SIOP model is *review and assessment*, critical issues for ELLs. ELLs benefit when teachers take time to highlight important information and make explicit vocabulary, content, and instruction strategies that are crucial for further learning and upcoming

assessment (Echevarria et al., 2004). Several techniques provide support for students attempting to master new content or language objectives: vocabulary review, review of key concepts, and frequent (formative) assessment of lesson objectives. Sequenced activities that deeply teach new words include contextualizing words, repeating words, providing examples of the words outside the original context, and repeated interactions with the new words over the course of several days. Reinforcing connections between words and meanings, and thinking of creative ways to add to a student's network of related words improve ELL students' learning (Beck, 2002).

Ultimately, reviewing and assessing key concepts becomes a continuous process. Before new lessons begin, past learning is reviewed. During lessons, new learning is summarized and informal assessments are undertaken (thumbs up, number wheel, partner shares). Response journals, group projects, partner activities, and individualized assignments provide teachers and students with learner feedback. After lessons, a final review helps ELLs assess their own understandings and serves to clarify misconceptions (Echevarria, et al., 1994). An opportunity for students to interact with their new learning deepens understanding and improves achievement.

Observational protocol

The SIOP model offers teachers, curriculum supervisors, and administrators an *observational protocol*, a tool listing features of a sheltered lesson with a rubric and scoring procedures that allows observing and evaluating a SIOP lesson. The protocol can be used in several ways. As a framework during lesson planning, it provides a common language and complete listing of the component features in a SIOP lesson and serves as a reminder to incorporate strategies in all eight areas of sheltered instruction. The observational protocol has also been used in observations to give teachers needed feedback on instructional practices, for

teacher self-assessment via videotaping, and research tool for researchers to study the implementation of SIOP techniques (Echevarria et al., 2004).

## Summary

Clearly, sheltering represents purposeful teaching that accelerates ELL students' learning of both content and language. Rather than basing teaching on a presumed, and erroneous, sameness among students, SIOP provides a systematic way to take linguistic diversity into account, without sacrificing high content standards. SIOP offers an alternative to the frustrations, and ultimately unsuccessful teaching, these science teachers reported. SIOP's way of taking the linguistic needs of ELL students into account suggests a way to disrupt this study's teachers' sense that their current approaches were not only unsuccessful, but doomed. No teacher, despite a lack of preparation for teaching ELL students, gains satisfaction from any students' lack of success. When one's (ELL) students routinely work hard, as these teachers reported was the case for their ELL students, dissatisfaction and frustration can hardly be surprising. Thus, the time is ripe for finding ways to incorporate strategies suggested by SIOP. As the survey of teachers at the freshman campus revealed, virtually ever teacher wished to have more training in ELL teaching methods.

## Limitations of the Study

This study has several limitations. The first and most significant limitation is that only three high school science teachers were studied and the teachers in one building were surveyed. Therefore, generalizability is limited. Teachers' practices and perceptions in the younger (K-5) and middle school (6-8) may differ significantly from those of high school science teachers.

The second limitation of this study is the focus on a large suburban district in West Michigan. Generalizability to urban, rural, and smaller suburban districts is limited. Many

smaller districts have limited ELL programs. This study offers insight into a large suburban high school with increasing numbers of ELLs.

A third limitation of this study is the focus on one region within Michigan. The findings may not be generalizable to other states because each state has different numbers of ELLs, different certification requirements, and different English language program requirements.

## Implications for Further Study

Future research could specifically identify teachers' perceived implementation of practices identified to increase academic language skills and CALP. Teachers could be asked to identify what resources, support, and professional development are needed to address language and content in the mainstream science classroom. Research could be done including all of the teachers in the science department at both the FVHS and the FVFC.

The next stage of the research should include more observations of and interviews with all teachers. Additional observations focused on determining what teachers are actually doing to meet the academic and language needs of ELLs would be beneficial. Repeated observations and interviews would offer the chance to substantiate how academic language is addressed and how content is made accessible to ELLs. Interviews with school and district personnel could offer insight into what mainstream teachers and districts are doing to prepare teachers and administrators for the changing school demographics.

## Institutional/District Culture

The Justice Department is stepping up enforcement of civil rights laws in schools. Its effort includes the opening of investigations concerning English language learners. Districts in Michigan are currently being investigated in compliance reviews by the Education Department's office for civil rights. The OCR is looking into whether the districts are ensuring

access to equal educational opportunities for ELLs. For example, the OCR is conducting a compliance review in Dearborn (Michigan) Public Schools. In the District, investigators are looking into whether communication is effective with parents of ELLs. The investigation also concerns the quality of counseling services for ELLs.

Falcon View High School is another district that has not taken sufficient action to ensure that all of its eligible ELL students receive adequate language support services. It does not provide adequate staffing for ELL programs to students district-wide. It is crucial that civil rights violations are addressed for ELLs and that appropriate services are available. In my opinion, the district needs to provide all mainstream teachers with SIOP training in their core content classrooms, such as math, social studies and science; deliver English as a Second Language instruction to all active ELL students consistent with state guidance; train and hire a sufficient number of teachers to meet the needs of its ELL population; ensure that special education ELL students are properly assessed and served in light of their unique needs; monitor the academic performance of current and former ELL students; offer compensatory services to the ELL students who have not been receiving any services; and give the parents of those students the information they need in order to make informed decisions regarding the ELL services that their children receive.

The real trick is it doesn't require a new certification for mainstream teachers. It requires a commitment by the school to provide training in the use of SIOP strategies in the program and to continue mutual support for every teacher's efforts to enhance academic English in the mainstream classrooms. Bielenberg and Wong-Fillmore (2005) explain that "children do not learn this kind of language on their own or through immersion in an English speaking environment. Mastering the academic English-and thus surviving high-stakes-tests-requires

instructional activities that promote language development in the context of learning intellectually challenging content" (p. 47).

In addition to the academic language for reading and writing, science teachers reported that science vocabulary, specifically the complexity and number of important terms, is another challenge. Although teachers cited academic language as the barrier to content-area success, they do not report using many practices to address language acquisition in their lessons. One of the least consistently used practices of the science teachers was defining language objectives. Planning meaningful activities that integrate content concepts with language practice opportunities for reading, writing, listening and speaking was also among the least consistently used practices. Short and Echevarria (2005) clarify," Implementing several of these (SIOP) strategies is not sufficient to ensure ELLs academic success. Without systematic language development, many (ELLs) never gain the academic literacy skills needed to succeed in mainstream classes, to meet content standards, and to pass standardized assessments" (p.10).

District administrators must consider teachers' preparedness, practices and needs as they make decisions regarding effective education for ELLs and increased academic achievement. When ELLs enter the mainstream science classroom, teachers do not have the training and resources necessary to meet the linguistic and academic needs while also addressing the Michigan Merit Curriculum Standards and English Language Proficiency Standards.

If there is an investigation by the OCR, Falcon View High School will need to address and resolve noncompliance findings raised by the Civil Rights Division of the United States Department of Justice and the Office for Civil Rights of the United States Department of Education regarding the inadequacy of the District's provision of services to ELLs. This implicates the District's obligations under the Equal Educational Opportunities Act of 1974

(EEOA) and Title VI of the 1964 Civil Rights Act. In the event that the OCR conducts a comprehensive review of a district's broader compliance with Title VI and the EEOA, it will examine many things. The U.S. Departments of Justice and Education outline schools' obligations to give ELLs special help to learn English *until* they are proficient in the language. In a comprehensive review, they determine, among other things, whether the district has developed a language program that is based on a sound educational theory or a legitimate experimental strategy; whether the district has adopted programs and practices reasonably calculated to implement its program effectively; whether the district has evaluated the effectiveness of its ELL program; whether the district has appropriate procedures for identifying and assessing ELL students who may require a language program; and whether notices about school activities are provided to parents or guardians in a language they can understand. The OCR and DOJ would continue their investigation through further school site visits, meetings with district staff, and review of current documentation.

Schools must provide every opportunity to accelerate learning and graduate students. This includes after-school, evening, weekend, and summer opportunities as well as independent studies and credit recovery. Schools should not assume a student won't graduate because they enroll at 17 or 18; schools must do all that they can to help the student succeed. This is not happening at FVHS, and as a result many ELLs are dropping out without a high school diploma. A majority of the ELLs are receiving less than an hour per day of ELL/ELD services and this is one of the violations that schools are cited for most often. In addition over 100 ELL students are counted for funding, but do not receive services.

It is crucial that all staff receives professional development in language development, language acquisition, content literacy strategies and aligning proficiency levels with the

District's 3-5 year plan and Board's critical issues. ELL staff should be engaged in curriculum development (scope and sequence and district-wide PD).

The District should ensure that all ELLs are enrolled in SIOP classes for all core content classes where instruction is primarily in English, and that teachers use sheltered content instructional techniques (such as, for example, grouping students by language proficiency level, adapted materials and texts, visual displays, cooperative learning and group work, primary language support, and clarification) to make lessons understandable. In addition, the District must ensure that in SIOP core content classes: (a) speech is appropriate for the ELLs' English proficiency level(s); (b) supplementary materials support the content objectives and contextualize learning; (c) the instructors teach vocabulary that is relevant to the subject matter; (d) adapted content, including texts, assignments, assessments, and presentation of content in all modalities, is within the ELL's English proficiency level; (e) ELLs are afforded regular opportunities to practice and apply new language and content knowledge in English; and (f) academic tasks are clearly explained to ELLs. The lack of professional development (PD) for mainstream, content area, and special education teachers (how they have been trained to deliver content to ELL students) is another OCR and Office of English Language Acquisition (OELA) violation that schools are cited for. FVHS does not provide any professional development to specifically train teachers to work with ELLs in their classrooms.

A science teacher at FVHS wrote in an e-mail:

I am not sure what grade to give Heh Meh in my second hour biology class. She has been unable to do much of anything this trimester. As you are aware, she is very quiet and reserved, and as a result of her culture and personality, has not asserted herself. She sits in class and quietly looks at pictures from the lab reference book most of the time. She does not have the Basic English skills to watch a video/DVD, read our reference books, fill out

information sheets, communicate with her lab partner, or take a test. Unlike other ELL students I have had, I have found it difficult to communicate with her in any fashion. I feel guilty because of this and feel I (we-all of us) have really let Heh down. I feel <u>very sorry</u> for her.

If I give Heh a NC for this class, what am I saying to her? That she was a failure in biology? You can't do high school work? You wasted your time in this class? I see this as an unfair situation for her to have been placed in to begin with. I wonder how she is viewing her time here in the U.S. Worse yet, I am wondering what <u>she</u> thinks about <u>herself</u>. I really don't believe that Heh has "failed" this course…butt rather, the system has failed <u>her</u>! And we are facilitating the system.

On the other hand, if I give her credit for being quiet, not causing trouble, looking at pictures and trying a couple of things in the lab, is this fair to the integrity of our academic standards at FVHS? I don't think so. If I do this, I believe I am merely continuing to support what I believe is a broken system instead of addressing it. I would simply be doinig the "easy thing" and moving on. For me personally, this would be both intellectually and morally wrong. Therefore, at this point I feel I should not give her either a NC or CR and simply ask you or The principal to give and enter the grade you feel is appropriate. I hope that you understand my feelings and position regarding this sweet young lady.

Grading at the high school can be a complicated situation and is a unique challenge. The first set of questions a teacher must ask is:

1.  What support structures are in place for ELL students?

2.  What accommodations are ELLs receiving in the classroom?

3.  How has instruction been modified to differentiate for language proficiency?

You can not fail an ELL student for poor scores or lack of mastery if any of these were

lacking or unavailable because they never had an equal chance of learning the material or mastering the curriculum. Schools also can not retain students because of lack of English proficiency. Based on the accountability structures enacted with NCLB, mainstream teachers of ELLs are required to help students develop both social and academic linguistic competence in addition to academic content-area knowledge and skills.

Is meaningful participation in educational programs being achieved through:

- Differentiated lesson delivery?

- English language development instruction?

- Accommodated assignments and homework?

- Accommodated assessments?

- Achievement comparable to peers?

Does the teacher have documentation of using ELL appropriate instructional strategies, materials, interventions, accommodations, staff collaborations and parental/family contact (in the language (in the language parents/family understand) to ensure equal access to the curriculum?

ELL Students Grading Scale

The ELL teachers provided the mainstream teachers with a grading scale based on Title III and OCR guidelines. ELLs, classified as LEP students by state and federal law, may not be assigned a failing grade in a course based on their lack of English proficiency. Teachers must utilize effective instructional strategies, materials, accommodations, and interventions, appropriate for ELLs, to ensure equal access to the general curriculum.

It is recommended that ELL students, who are placed in required regular education classes outside of the ELL department, are graded through the use of A, B, C and CR/NC. In order to help determine how to use the CR/NC grading scale, the following guidelines should be followed.

- Consider knowledge of the English language and/or effort to determine grade.

- Grades: A, B or C – excellent progress towards understanding.

-  Credit (CR) – making some progress, plus showing effort (completing assignments, working/completing tests, quizzes, exams, and fully participating in class activities)

- No Credit (NC) – not progressing because of the lack of effort (not completing assignments, not working/completing tests, quizzes, exams and not participating in class activities)

The following conversation took place between an ELL teacher and a mainstream science teacher:

Science teacher: "So, all ELL students pass regardless of their ability? Isn't this promoting just the opposite of what sound education is?"

ELL teacher:

A majority of the ELL students were performing at grade level in their native language. If after the accommodations are made, the student does not make any effort then that would be the time to give no credit. Please remember that many of our ELL students do graduate and enroll in community colleges and universities. In the beginning, it is like trying to catch up with a moving target. I am only reiterating what the OCR and Title III mandate. Sound educational practice needs to incorporate appropriate instruction for this growing population of students.

Science teacher: "It doesn't matter who dictates it since American students who struggle remain under different standards without the same benefit."

<center>ELL Students Classification</center>

- *Active ELL students* - Students who have one or more ELL classes.

- *Transitioning ELL students* - Students who are taking all general education classes yet they still need to be monitored.

- *Exited ELL students* - Completely mainstreamed students.

Students exit ELL mainly through the English Language Proficiency Assessment (ELPA) Screener and student/parent request. It can be difficult for the teacher to know how much to expect from ELL students in the class. Many times an ELL student has acquired basic interpersonal communication skills (BICS), but doesn't have cognitive academic language proficiency skills (CALPS). It usually takes 5-7 years for non-native speaking students to fully master academic aspects of a second language and to attain the fluency and performance level of a typical native-speaker. Current research supports an even longer period for the full mastery. In order to assure students' successful academic performance, all three groups are subject to ongoing monitoring. If the students' level is advanced proficient or their second year of proficiency on the ELPA, they do not qualify for the alternative grading scale.

Table 2: Rating scale for students' language proficiency

| Grade levels listed are approximate. (English) reading levels, based on ELPA scores. Most students will fall somewhere in the middle of the range. |
| --- |
| **NC (Newcomer)** = New to the country |
| **B (Basic)** = Kindergarten - 3rd gd.<br>Students with limited formal schooling - limited or no understanding of English. |
| **LI (Low Intermediate)** = 2nd - 5th gd.<br>Speech emergent - students can comprehend short conversations on simple topics. |
| **HI (High Intermediate)** = 3rd - 6th gd.<br>Students can understand standard speech delivered in most settings with some repetition and rewording. |
| **P (Proficient)** = 5th - 8th gd.<br>Students language skills are adequate for most day-to-day communication needs. |
| **AP (Adv. Proficient)** = 6th - 12th gd.<br>Students are expected to be able to participate fully with their peers in grade level content area classes. |

The most common standards that students did not meet expectations on in the spring ELPA

were:

- Making inferences and predictions and conclusions.

- Provide and obtain information; express and exchange opinions.

- Use strategies to extend communicative competence.

- Use various types of writing for specific purposes.

- Analyze style and form of genre.

- Identify author's voice, attitude, and point of view.

- Read and demonstrate comprehension of main ideas and supporting details.

- Apply reading in social academic context.

- Identify meaning of vocabulary in content areas.

- Understand spoken English to participate in social contexts.

- Follow simple and complex directions.

The ELPA data needs to be analyzed at the secondary level and ELL and content area teachers need to work closely in order to develop appropriate interventions. The 10$^{th}$ grade Hispanic students scored 25 and 23 points higher than Black and Asian students. Students with interrupted formal education (SIFE) lagged behind non-SIFE students by 46 points overall. 11$^{th}$ grade male students outscored females by 4.8 points, but there was not a great difference in proficiency levels. 12$^{th}$ grade averaged a 7 point deficit in speaking.

The Annual Measureable Achievement Objectives (AMAOs) are going to be stricter over the next few years. The two impacting FVHS the most will be the changes in AMOAs 1 and 2. For AMAO 1, the percentage of ELLs raising their scores by 4 points or higher will need to rise from 75% to 77%. AMAO 2 will raise the percent of ELLs who need to either exit or score proficient. Right now it is 10%, in 2011-2012 it will rise to 13%, and in the 2012-2013 school

year it will increase to 20%. FV Public Schools did not miss any of the AMAOs. The AMAO I objective was met with 87% progressing, AMAO II was met with 32% proficient, and AMAO III demonstrated AYP for the ELL sub-group on the statewide assessment program. An On Site Review Team from the Michigan Department of Education, Office of Field Services did a Title III review and evaluation of the ELL program at FVPS on April 16, 2010 in order to:

- Fulfill the Michigan Department of Education's oversight responsibilities of reviewing all ELL/Immigrant programs performance and ensure that the educational needs of ELL/Immigrant students are being met under the NCLB Act,

- Encourage program coordination and collaboration,

- Assist Department Consultants to identify the district's program and development needs, and

- Identify promising practices and share them with other districts.

The Title III Monitoring/Evaluation Consultant had the opportunity to visit one elementary school, a middle school, and FVFC. The Title III Audit should have covered all of the buildings in order to make an accurate evaluation of what is really going on. The consultant made the following recommendations:

- It is recommended that the district formalize a written description to clearly demonstrate the progress made by ELLs.

- It is recommended that the district formalize a written description of the ESL Instructional Model for Elementary, Middle and High School levels within the ELL Program description.

In addition, he required the following changes:

- It is required that the district develop a written process/procedure to effectively

monitor the progress made by ELLs in meeting challenging state academic content and performance standards for each of the two years after exiting the program. The information should include the following:

1. How many formerly limited English proficient (FLEP) students were not successful?

2. If not, was it due to English proficiency?

3. How many students returned to the ELL program?

It is required that the district develop a clear written process/procedure for complaints related to services to ELLs.

<div align="center">MME Demographic Summary – Falcon View Public: FVHS</div>

In English Language Arts, the 11th Grade Limited English Proficient (LEP) 2008-09 AYP Target was 61%. At FVHS, 7% of the ELL students met or exceeded State Standards (Levels 1 & 2). At the District level 7% of ELL students met or exceeded State Standards (Levels 1 &2). At the State level, 12% of ELL students met or exceeded State Standards (Levels 1 &2). None of the ELL students exceeded Level 1, 0%, 7% met Level 2, 36% tested at a Basic Level 3, and 57% were at the Apprentice Level 4.

In Mathematics, the 11th Grade Limited English Proficient (LEP) 2008-09 AYP Target was at 55%. At FVHS, 7% of the ELL students met or exceeded State Standards (Levels 1 & 2). Districtwide 7% of ELL students met or exceeded State Standards (Levels 1 & 2). At the State level, 20% of ELL students met or exceeded State Standards (Levels 1 &2). None of the ELL students exceeded Level 1, 7% met Level 2, 29% achieved the Basic Level 3, and 64% scored at the Apprentice Level 4:

The Michigan Merit Examination (MME) assesses students in grade 11 (and eligible students in grade 12) based on Michigan high school standards. It is administered each spring,

and consists of three components:

- ACT Plus Writing® college entrance examination

- WorkKeys® job skills assessments in reading, mathematics, and "locating information"

- Michigan-developed assessments in mathematics, science, and social studies.

Note: 467 recently-arrived ELL students took part in the State's ELPA in addition to the MEAP/MME/MI-Access. Recently-arrived ELL students must also take the MME. The parts of the MME that contribute to the MME English Language Arts score are not separable from the rest of the test. For this reason, recently-arrived ELL students must take all portions of the MME. Their resultant ELA results will not show a final score, but for purposes of calculating participation for AYP (Adequate Yearly), they will be recorded as having taken the assessment.

Approximately 74% of FVHS's 2008 graduates applied to attend advanced degree-granting institutions. Specifically, this breaks down into 46% who have gone on to four-year colleges and universities and 28 percent to two-year institutions. The main intent of those entering a two-year school was to transfer to a four year school.

## Cultural Competence and SIOP

"Aren't we going to 'launch' today?" Then came the laughter. FV teachers are encouraged to send students off with a positive message. This time, a simple phrase was mistaken, and then a pun spun for fun by wise-cracking students. But this was not the run-of-the-mill pun. It came easily from ELLs at FVHS. And while they joked about their error, laughing at themselves, their "launch" helped me understand some things.

Trust can be a river that runs through a classroom, and it can carry along both students and teachers. Native speakers easily dress themselves in words that give the impression they choose. But listen closely the ELLs, and you hear people with character laid bare. Uncovered by

experience with English, undressed of that confidence, and under great social pressure, these students constantly face their need of language in this country. In the ELL classroom, every trimester, students found comfort in the ELL teacher's patience, learned about who to trust, then found courage to keep trying. And the lesson plan worked this way again and again.

Where some might find them lacking, to me they seemed rich. They are rich in other languages, and rich in humility. This fine quality, when enabled by patience and trust, grew into courage as I watched and wondered: How much effort does it take to struggle with language and ideas demanded by those around you? How much strength to face the judgment of a person able with English? How much pressure to even connect with friends in a big school? How much confidence to learn to talk with those offering the education the power?

Students want power over their lives, just like anyone. Their teacher worked to build the power in them. The teacher first smiled kindly at faces and offered handshakes and polite greetings. Then, she asked questions, listened and responded to what these kids could tell of their lives. Answers were given in a halting, unsophisticated way. So, with patience she gave an ear that they might not enjoy for their words. Then, with their trust, she repeated phrases carefully and provided pronunciation. Their words, though fewer, carried as much weight as others you might hear.

To those she serves, the ELL teacher is a "feeder." It is a metaphor that works. Her warm relationship with them helps meet appetites that are insatiable. Trust is like the cooking fire for all things that emerge from this kitchen.  Patience and trust nourishes learners, which lets honesty and interest emerge. From there, students grow in knowledge and skills. This recipe for a lesson plan works

A firm tone of discipline was another important ingredient, providing redirection and

focus. The teacher spent great effort aiming at what to provide her students, but also knew what was necessary to demand. This was a trusted trade. Like a futures contract, effort for education. And from this teacher, a firm brand of trust, more than felt from teachers as "friends for a trimester."

Students and teachers were teaching and learning, together. Over time, transforming some hopefully, but purposely. Her lesson plan worked this way. The students of English and the teacher whom I observed educated and energized each other. Though I felt like an intruder on an adventure with explorers crossing some unknown, I also felt warmth and comfort over the hour. When the ELL students walked through the door, often before I could speak, they faithfully greeted me in English with a smile. They knew its power well. "Aren't we going to 'lunch' today?" Then more smiles and laughter.

The Falcon View Superintendent said the District has 1,000 employees and there is a goal to constantly monitor the organizational culture to ensure the district is adjusting to what the needs of the student population are. He said:

> One of the big criticism of professional development is it often happens without a vision and plan that scaffolds and builds on itself. We are going to have a shared vision and plan for cultural competency and diversity in our district. If we are going to be successful, we have to engage the wide variety of families in our district.

"Excellence and Equity for All" is the motto of Falcon View Public Schools. Common assessments with common scoring rubrics, a common curriculum, common core materials, and a common electronic standards-based report card were intended to assist the district in working toward their goal of equity. The Falcon View High School graduation rate goal was 80%. The State graduation rate was at 65.51% for ELLs and FVHS's graduation rate of ELLs was 62.16%.

The attendance rate goal was 90%. The State had a 94.6% attendance rate and FVHS had a 96.3% attendance rate for the ELLs.

The principals at Falcon View High School and Falcon View Freshman Campus have not received professional development in the unique language and learning of ELLs. They are unable to provide teachers instructional assistance about the needs of ELLs and best practices after lesson observations or during conferences. The District culture, which leaves teachers unprepared to teach ELLs in mainstream classrooms, needs to be transformed. All ELL staff in kindergarten through 12th grade shared an overwhelming concern that they are operating under a "triage" system rather than as a "most effective system." The ELL staff would like to be more a part of trainings (professional development) and involved in some of the conversations-both at the building and district levels. Since ELLs are a focus in building plans and district plans, they would like their voices to be heard.

APPENDIX A: INDIVIDUAL INTERVIEW PROTOCOL

Interview Protocol 1

I am conducting research for my dissertation for my doctoral program at Wayne State University. As a participant observer, I am focusing on the interactions I observe in the classroom. I was hoping that you could answer a few questions for me. Of course you have the right not to answer any question if you would rather not.

Tell me about your history as a teacher.

1. Tell me about all of the training that you have received for working with ESL students

2. What training would you recommend for subject area teachers of ESL students?

3. What is it like to have English language learners (ELLs) enrolled in your class?

4. What are all the techniques or strategies that you use with ESL students? Describe each one.

5. Can you describe for me all the challenges of including ESL students in your classes?

6. In addition, can you list all the benefits of including ESL students in your classes?

7. What would be your reaction to receiving more ESL students in your classes?

8. Can you describe for me all of the strategies that work well with the ELLs and why?

9. Describe for me strategies that have not worked well with ELLs.

10. How do you find out about the educational-language needs of your student?

11. How does this inform your planning?

12. What are the most common learning strategies used by your students? Do you notice any significant changes in the way students are learning during the course? What do you see as your role in this process? (Examples?)

13. What do you want your students to be able to do at the end of the course? How do you

teach this? (What do you see as your role?) In your opinion, is this familiar to/different from what they are used to?

14. What do you think students want from their educational experience here in America?

15. Do you think that students experience any tensions between their own culture and what they experience here? How do you manage these tensions?

Interview Protocol 2

1. How do you know the English proficiency of your students?

2. How do you know if your students are making progress?

3. Do you believe that the curriculum should be adapted to accommodate ELLs?

4. Tell me all the methods that you use to assess the ELLs?

5. Please list all of the types of assessments that you use in Biology A and B.

6. How often do you use the assessments? i.e. yearly, monthly, weekly, daily

7. How do you use the data to improve your teaching?

8. If an ELL performs at a level lower than you expected, do you attribute it to lack of English proficiency, difficulty of the text, cultural content in the text, classroom environmental factors, lack of effort, or a combination of factors?

9. Do you find yourself simplifying the academic language of Biology in order to increase comprehension?

10. Please list for me all of the ways that you modify the content to make it more accessible and comprehensible?

Interview Protocol 3

1. I'm interested in what was going on there in the lesson and what your intentions were. Can you please clarify for me the reason that you chose this method of presentation?

2.  Would you like to talk about why you chose that as an activity and what you hoped the students would get out of it?

3.  Can you explain a little more about what you mean?

4.  Can you define a term you just used?

    Could you give an example of what you mean?

APPENDIX B: FOCUSED GROUP INTERVIEW PROTOCOL

Thank you for participating in the focus group interview. You have been invited to participate in the research project because I am conducting research on English language learners in the Biology classroom and all of you are Biology teachers. I will be recording the interview and taking notes. I am requesting permission in order to record our interview. The ground rules for the discussion are:

- Everyone should participate.

- All ideas are equally valid.

- There is no right or wrong answer.

Each person's view should be heard and respected.

Interview Questions

1. How do you find out about the educational-language needs of your student?

2. How does this inform your planning?

3. What are the most common learning strategies used by your students? Do you notice any significant changes in the way students are learning during the course? What do you see as your role in this process? (Examples?)

4. What do you want your students to be able to do at the end of the course? How do you teach this? (What do you see as your role?) Is this familiar to/different from what they are used to?

5. What do you think students want from their educational experience here in America?

6. Do you think that students experience any tensions between their own culture and what they experience here? How do you manage these tensions?

In addition, I will use techniques such as probes, related statements, or statements such as "Can you explain a little more about what you mean?" "Can you define a term you just used?" or "Could you give an example of what you mean?"

APPENDIX C: SURVEY OF TEACHERS

Following is the demographic information gathered in a survey conducted with the teachers at Falcon View Freshman Campus; 37 of 37 teachers completed the survey for a return rate of 100%.

1.  What subject areas do you teach?

    English Language Arts 5

    Social Studies 4

    Math 5

    Biology 6

    Business 2

    Fine Arts and Music 3

    World Languages 3

    Physical Education/Health 2

    Vocational 1

    Special Education 2

    ELL 1

    Elective 3

2.  How many years have you been a teacher?

    Range 1-37

    Mean 13.7

3.  Please indicate your gender.

    Male 16

    Female 21

4. Is English your native language?

       Yes 37

       No 0

5. Do you speak a second language?

       If yes, please estimate your highest level ability level attained.

       Beginner 2

       Intermediate 4

       Advanced 5

6. Have you received training in teaching English language learners?

       Yes 7

       No 30

7. Have you ever had an ESL student enrolled in your class?

       Yes 34

       No 3

8. Are you interested in receiving more training in working with ESL students?

       Yes 32

       No 5

APPENDIX D: ELLS' CAPABILITIES BY SCHOOL

| Schools | NC/Basic | Low Intermediate | High/P1 Intermediate | Total Active ELL Students | P2 & 2nd year Monitor FLEP Status |
|---|---|---|---|---|---|
| BN | 18 | 4 | 22 | 44 | 1 |
| BW | 5 | 10 | 24 | 39 | 12 |
| CH | 14 | 15 | 24 | 53 | 12 |
| DI | 14 | 23 | 58 | 95 | 10 |
| EN | 10 | 20 | 68 | 98 | 9 |
| EX | 21 | 13 | 42 | 76 | 13 |
| GL | 1 | 8 | 31 | 40 | 5 |
| ML | 15 | 10 | 23 | 48 | 2 |
| SW | 4 | 11 | 22 | 37 | 16 |
| TL | 3 | 11 | 22 | 36 | 9 |
| **Total Elem** | 105 | 125 | 336 | 566 | 89 |
| | | | | | |
| CW | 38 | 20 | 42 | 100 | 28 |
| PW | 0 | 3 | 22 | 25 | 17 |
| VW | 0 | 7 | 16 | 23 | 4 |
| **total 6-8** | 38 | 30 | 80 | 148 | 49 |
| | | | | | |
| X-Roads | | | | 8 | |
| FVFC 9 | 30 | 14 | 23 | 67 | 9 |
| FVHS 10-12 | 30 | 54 | 46 | 130 | 6 |
| **total 9-12** | 60 | 68 | 69 | 205 | 15 |
| | | | | | |
| **District total** | 203 | 223 | 485 | 919 | 153 |

X-Roads data not available – no ELL staff in X-Roads building.

| By Caseload: | NC/Basic | Low Intermediate | High/P1 Intermediate | Total Active ELL Students | P2 & 2nd year Monitor FLEP Status |
|---|---|---|---|---|---|
| Alicia | 15 | 30 | 92 | 137 | 21 |
| Sharon | 33 | 14 | 45 | 92 | 3 |
| Margaret | 15 | 31 | 89 | 135 | 15 |
| Maria | 18 | 26 | 46 | 90 | 28 |
| Samantha | 24 | 24 | 64 | 112 | 22 |
| | | | | | |
| CW | 38 | 20 | 42 | 100 | 28 |
| VW & PW | 0 | 10 | 38 | 48 | 21 |
| | | | | | |
| FVFC | 30 | 14 | 23 | 67 | 9 |
| FV | 30 | 54 | 46 | 130 | 6 |

# APPENDIX E: ENGLISH LANGUAGE LEARNERS BY SCHOOL

| Elementary Schools | BN | BW | CH | DI | EN | EX | GL | ML | SW | TL | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Spanish | 5 | 16 | 21 | 40 | 16 | 14 | 16 | 11 | 20 | 31 | **190** |
| Myanmar dialects* | 11 | 2 | 4 | | 1 | 5 | | 9 | | | **32** |
| Albanian | | | | 3 | 2 | | 2 | | | | 7 |
| Bosnian | 5 | 3 | 7 | 15 | 19 | 11 | 6 | 5 | 2 | 11 | **84** |
| Kirundi | | | | 1 | | | 6 | | | | 7 |
| Nuer | | 1 | | | | | | 1 | | | 2 |
| French | | 2 | | | 1 | | | | | | 3 |
| Fr. Creole | | 1 | | | 1 | | | 1 | | | 3 |
| Vietnamese | 14 | 12 | 11 | 28 | 29 | 50 | 5 | 16 | 13 | 1 | **179** |
| Nepali | 5 | | 2 | 1 | | | | | | | **8** |
| Chinese | 1 | | 1 | | 4 | 1 | | | 1 | | **8** |
| Swahili | | | 2 | 1 | 1 | | 1 | | | | **5** |
| Amharic | | | | | | | 1 | | | | **1** |
| Mandinka | | | | | | | | 2 | | | **2** |
| Krahn | | | | | | | 1 | 3 | | | **4** |
| Arabic | | 2 | 15 | 5 | 9 | | | 3 | | | **34** |
| Hatian Creole | | | | | | | | 1 | | | 1 |
| Fuller | | | | | | | | 1 | | | 1 |
| Somali | 4 | | 6 | 2 | 5 | | 2 | | | | **19** |
| Punjabi | | | | | | | 1 | | | | 1 |
| Kinyarwanda | | | | | | | 1 | | | | 1 |
| Thai | | | | | | | 1 | | | | 1 |
| Ewe | | | | | | | 1 | | | | 1 |
| Hindi | | | | 3 | | | | | | | 3 |
| Korean | | | | 1 | 2 | 1 | | | | | 4 |
| Croatian | | | | 1 | | | | | | | 1 |
| Jargon | | | | 1 | | | | | | | 1 |
| Shona | | | | 1 | | | | | | | 1 |
| Oromo | | | 1 | 1 | | | | | | | 2 |
| Burawa | | | | 1 | 1 | | | | | | 2 |

| Elementary Schools (cont'd) | BN | BW | CH | DI | EN | EX | GL | ML | SW | TL | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bangla | | | | | 1 | | | | | | **1** |
| Telugu | | | | | 6 | | | | | | **6** |
| Konkani | | | | | 1 | | | | | | **1** |
| Tamil | | | | | 2 | | | | | | **2** |
| Chaldean | | | | | 1 | | | | | | **1** |
| Zizigua | | | | | 1 | | | | | | **1** |
| Visayas | | | | | | 1 | | | | | **1** |
| Turkish | | | | | | 1 | | | | | **1** |
| Hmong | | | | | | 1 | | | | | **1** |
| Polish | | | | | | | | | 1 | | **1** |
| Urdu | | | 1 | | | | | | | | **1** |

* Myanmar dialects are not necessarily mutually understood. 41 different languages

| High Schools | CW | PW | VW | FVFC | FV 10-12 | X-Roads | |
|---|---|---|---|---|---|---|---|
| Spanish | | 21 | 16 | 2 | 38 | | **38** |
| Myanmar dialects | | | | 14 | 25 | | **25** |
| Albanian | | | | | 3 | | **3** |
| Bosnian | | 7 | 4 | | 10 | | **10** |
| Kirundi | | | | 2 | 7 | | **7** |
| Neur | | | 2 | | 2 | | **2** |
| French | | 1 | | 1 | 4 | | **4** |
| Fr. Creole | | 1 | | 2 | 2 | | **2** |
| Vietnamese | | 4 | 4 | 9 | 21 | | **21** |
| Nepali | | | | 3 | 2 | | **2** |
| Chinese | | 2 | | 1 | 1 | | **1** |
| Italian | | | | | 1 | | **1** |
| Russian | | | | | 1 | | **1** |
| Bravanese | | | | | 2 | | **2** |
| Swahili | | 3 | | 3 | 5 | | **5** |
| Amharic | | | | | 2 | | **2** |
| Somali | | | | 3 | | | **3** |
| Arabic | | | | 1 | | | **1** |
| Romanian | | 1 | | | | | **1** |
| Krahn | | | 1 | | | | **1** |

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**ABSTRACT**

**TEACHING ENGLISH LANGUAGE LEARNERS IN MAINSTREAM SCIENCE CLASSROOMS: TEACHER PRACTICE AND EDCATIONAL OPPORTUNITY**

by

**CARLOTTA DOROTHY SCHROEDER**

**MAY 2011**

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**Major:** Curriculum and Instruction

**Degree:** Doctor of Philosophy

Equal educational opportunity for English language learners (ELLs) has been a goal of the public educational system in the United States. Language policy reforms have increased accountability in order for schools to improve student achievement and measure the progress of ELLs. The No Child Left Behind Act (NCLB) requires assessment and accountability. In this study, the number of ELLs has increased significantly at the high school level and school district as a whole.

Along with the changing demographics, the findings reveal a district-wide policy of equalizing educational opportunity through equal treatment. Language policies provide critical decisions about how to measure what students know in all subjects. The assimilation model limited access to mainstream course content, produced inaccurate assessment results and grades. The science curriculum was only accessible through English and the use of the students' native languages was discouraged. The voices of the students were silenced and their academic achievement continues to lag behind their English-speaking peers.

# AUTOBIOGRAPHICAL STATEMENT

My interest in learning foreign languages and exploring diverse cultures began in early childhood. My father graduated from the medical school at Wayne State University and cultivated friendships with colleagues from many different cultural backgrounds. He started his first medical practice in Northport, Michigan. He took great pride in his own cultural heritage and encouraged me to appreciate other cultural traditions.

My high school was Leelanau Schools (Pinebrook for Girls) located in Glen Arbor, Michigan. I was able to study Spanish and English literature and made many friends from all over the world. Several of my dedicated teachers started Pathfinder Schools in Traverse City, Michigan and I followed them my senior year and was their first graduate. Learning multiple languages expanded my global understanding and opened up whole worlds of art, music, science, literature, politics, history and philosophy.

I received my Bachelor of Arts degree in Spanish and German and my secondary certification in foreign language at Grand Valley State University. I taught K-12 Spanish and German and completed a K-6 Spanish endorsement, but it wasn't until I had the opportunity to teach bilingual Spanish classes at Union High School in Grand Rapids that I found my niche.

I was inspired to complete my bilingual Spanish endorsement through Wayne State University. In addition, I completed an ESL endorsement and a Masters degree in Bilingual Bicultural Education at Wayne State University. Dr. Marc Rosa encouraged me to continue my studies in the doctoral program.

For the past 13 years, I have been teaching English Language Learners at East Kentwood High School. The world comes to me. There are over sixty different languages and cultures represented in my ESL classroom.