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AN EVALUATIVE CASE STUDY OF A MATHEMATICS PROGRAM AT A DEAF  
SCHOOL IN GHANA AND AN ECOLOGICAL EXPLANATION FOR CHALLENGES  
PREVENTING DEAF STUDENTS ACCESS TO QUALITY EDUCATION

by

Hilary Melander

A thesis submitted to the faculty of

Brigham Young University

in partial fulfillment of the requirements for the degree of

Master of Science

Department of Sociology

Brigham Young University

November 2008

BRIGHAM YOUNG UNIVERSITY

GRADUATE COMMITTEE APPROVAL

of a thesis submitted by

Hilary Melander

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As chair of the candidate's graduate committee, I have read the thesis of Hilary Melander in its final form and have found that (1) its format, citations, and bibliographical style are consistent and acceptable and fulfill university and department style requirements; (2) its illustrative materials including figures, tables, and charts are in place; and (3) the final manuscript is satisfactory to the graduate committee and is ready for submission to the university library.

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## ABSTRACT

# AN EVALUATIVE CASE STUDY OF A MATHEMATICS PROGRAM AT A DEAF SCHOOL IN GHANA AND AN ECOLOGICAL EXPLANATION FOR CHALLENGES PREVENTING DEAF STUDENTS ACCESS TO QUALITY EDUCATION

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Master of Science

The two purposes of this study are first, to provide an evaluation of an after-school mathematics program at the Demonstration School for the Deaf Junior Secondary School (DemoDeaf) in Mampong-Akuapim, Ghana. Second, it provides an ecological discussion exploring why DemoDeaf students do not have access to quality education.

I designed and piloted the math program in 2005 and 2007 as an action researcher and volunteer with the Non-Government Organization (NGO), Signs of Hope International. The program was developed after finding six students in one JSS class could not count to one-hundred and all other students struggled with addition and/or subtraction. The program has been shown quantitatively and qualitatively to have statistically significant and positive effects on DemoDeaf students.

In 2007, the number of students proficient in counting increased from thirty-four to forty-four. An analysis of the addition achievement test results indicate students advanced a total of twenty-nine levels; four students learned to add single-digit numbers together, eleven students learned how to add double-digit numbers together, and fourteen students learned how to add triple-digit numbers together. An analysis of the subtraction achievement tests indicate students advanced a total of nineteen levels; six students learned to subtract single-digit numbers, eight students learned how to subtract double-digit numbers, and five students learned how to subtract with triple-digit numbers. Sample-t-tests showed that the increase of students proficient in counting, addition, or subtraction (except for triple-digit subtraction) was statistically significant at the *p-value* of  $<.01$  or  $<.05$ .

The stigma and negative stereotypes embedded in the normative culture in Ghana and the majority/minority relations and power dynamics between hearing and deaf groups influence the socializing institutions of the family and deaf schools. The normative hearing culture influences the language choice parents/guardians give their deaf child and how they treat them. The perspectives and values of hearing educators and administrators influence deaf school design and create a hidden curriculum for deaf students. These separate forces meet in the classroom and not only prevent students from receiving a quality secular education, they also reinforce the low status ascription of deaf students in Ghana.

## ACKNOWLEDGEMENTS

This study could not have been done without the support of several key people across the globe. First, I am grateful for Headmaster Madame Agnes and teachers at the Demonstration School for the Deaf in Mampong-Akuapim, Ghana, for making this study possible by opening up their school and classrooms to me. Specifically I wish to recognize Daniel Amoah for the example and resource he was to me at DemoDeaf. Never have I seen anyone as dedicated to the DemoDeaf students as he is. He is truly received by students as a father figure at the school.

I am appreciative of Signs of Hope International co-founders, Curry Jones and Erin Staffanson McGibbon for granting me permission to use my time with Signs of Hope to implement my researching skills as an intern in 2005 and field facilitator in 2007. The encouragement Curry offered me while at DemoDeaf gave me the confidence and the vision to develop the math program and Book Club.

Words cannot express the gratitude I feel for Carol Ward, my mentor, committee chair, and friend. Not only has Carol given countless hours of counsel and advisement as she has guided me through the thesis process, but her positive attitude and outlook on life and people has taught me to appreciate and have confidence in the ideas, gifts, and differences of other people.

I am also grateful for my committee members and the confidence they have shown in my ability. I give a special thank you to Bryan Eldredge, from Utah Valley University, for joining my committee and guiding me through the Deaf Studies literature. His counsel proved to be invaluable to me by helping me recognize the different life-experiences Deaf

people have from hearing people. As a result he has helped me to appreciate my own experiences growing up as a child of a Deaf adult (CODA) and how much being a CODA has enriched my life.

Finally, thanks goes to my parents for the love and support they have offered me throughout my life. They have taught me to embrace my bi-cultural/bi-lingual experiences, to constantly seek opportunities to serve others, and to do whatever I set my mind to.



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## CHAPTER 1: INTRODUCTION

Student achievement at the Demonstration School for the Deaf Junior Secondary School (DemoDeaf) in Mampong-Akuapim, Ghana is influenced by micro and macro scale social forces that prevent them from having access to quality education. Like many schools in developing countries receiving aid from Non-Government Organizations (NGO), DemoDeaf receives teaching and sign language support from Signs of Hope International. This assistance is designed to improve student access to academic learning opportunities through increasing their interaction with instructors and volunteer teaching assistant interns sent to the school during the summers.

Signs of Hope International interns work with students in the classroom during and after school by providing classroom instruction, one-on-one tutoring, and engaging in informal conversations and recreational activities. All of these activities are conducted in Ghanaian Sign Language (GSL). GSL is a dialect of American Sign Language. There are significant differences and no user of one or the other would mistake one for another, but they do pass the “mutual intelligibility” test<sup>1</sup>. A fortunate result of this fact is that interns can quickly adapt to local signs to meet the needs of the students.

In this study, I examine the challenges Signs of Hope interns face in the classroom. I argue that these challenges actually lessen the effectiveness of the teacher assistantship program. However, I also offer a mathematics program as an organizational solution that has been qualitatively and quantitatively shown to effectively improve the

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<sup>1</sup> Dr. Andrew Foster, the first Deaf black graduate of Gallaudet University, spread the use of ASL in Ghana when he originally came to Ghana in 1957 to preach Christianity and to establish Deaf schools.

math skills of students at DemoDeaf. The program also provides interns a specific curriculum for them to teach. To support and contextualize my findings I also include a discussion of the multifaceted macro and micro forces that structures the school in a way that perpetuates the stratification and status ascription of Deaf people in Ghana. By considering the challenges in the classroom, the different elements of the math program, and the context in which the students are going to school I am also able to offer additional suggestions about program expansion and ways in which educators and policy makers may increase the accessibility of education to Deaf people in Ghana.

As an intern with Signs of Hope in 2005 from May until August, I experienced obstacles in performing my role as a teacher assistant in the classroom. By observing students and teachers in their classes and specifically noting student/teacher interaction, volunteer/student interaction, student participation, teaching approaches, GSL in the classroom, and engaging in informal conversations with teachers, students, and administrators I learned that there are several issues in and out of the classroom that are preventing interns from helping to improve students access to quality education. These challenges include: differences in subject matter interns are asked to teach (e.g. Ghanaian social studies verses U.S. Social studies), intern inexperience with local knowledge, DemoDeaf teachers having limited knowledge of GSL and Deaf culture, and students having noticeably low literacy and math skills. The mathematics program is the result of hours of extensive consideration of these issues and various attempts to find more efficient and effective ways of assisting students and teachers at DemoDeaf.

### *The Mathematics Program*

The 2005 math program consisted of class demonstrations, group work, and one-on-one tutoring randomly taught during the day by a single intern in classes with absent teachers. Subsequent analysis of the math program led me to modify the math program in hopes of having the opportunity to implement it again. The changes to the program included adding pre and post math achievement tests to measure overall program effectiveness and placing students into groups according to math ability with each group led by one of three interns in the classroom. In 2007 I returned to DemoDeaf as the summer coordinator for Signs of Hope International and reintroduced the modified mathematics program. This time, however, the program was designated by the Head Master as an after-school program held after supper.

In 2007 I found that student math achievement levels were similar to those in 2005. In 2007 thirty-four out of forty-seven students could successfully count from one to one-hundred. Thirty-four out of forty-seven could add single-digit numbers together. However, only twenty students could add double-digit numbers together and fourteen students could add triple-digit numbers. By the end of the 2007 math program the number of students who could proficiently count to one-hundred increased from thirty-four to forty-four. The number of students who could successfully add single-digit numbers increased from thirty-four to thirty-nine. Students proficient in adding double-digit numbers increased from twenty to thirty-one students while the number of students proficient in adding triple-digit numbers increased from fourteen students to twenty-eight. Students also showed improvement in subtraction.



At the beginning of the 2007 program only twenty-five of the forty-seven students were able to subtract single-digit numbers from other single-digit numbers. By the end of the program, this number increased to thirty-one. While only nine students successfully subtracted double-digits from double-digits, by the end of the program this number increased to seventeen. The number of students able to subtract from triple-digit numbers increased from four to nine.

The use of math achievement data collected through quantitative means allowed me to measure whether the student math skill level improved from the beginning of the program to the end significantly. Simple paired t-tests show that the program did significantly increase student math ability<sup>2</sup>. As an applied researcher I am not only interested in how the math program influenced the students and their math abilities. I am also interested in understanding why the students show such low math skills in the first place. To understand why DemoDeaf students demonstrate such low math performance levels, I use an ecological approach to acknowledge and explore the multifaceted forces that simultaneously influence the quality education DemoDeaf students receive. As I delve deeper into these forces it will become apparent that the purpose of DemoDeaf is

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<sup>2</sup> Institutional Review Board (IRB) approved this study in May of 2007<sup>2</sup>. Signs of Hope co-founders, the DemoDeaf Headmaster, department head approved the study upon receiving a copy of the IRB proposal. IRB approval included approval of the use of field notes recorded from my 2005 internship with Signs of Hope International. The headmaster offered the use of the classrooms for the after-school program. Suggestions given to the researchers from the local teachers during conversations about the program and students are adapted into the program.

not to provide a quality secular education for students; but that the hidden curriculum at the school reinforces and produces the low status ascription of deaf students individually and as a whole.

### *An Ecological Approach*

As a linguistic minority experiencing the struggles associated with majority/minority power relations, Deaf<sup>3</sup> people face stigma in their everyday lives. The negative stereotypes and attitudes the majority of hearing people in Ghana have towards deaf people produce inequalities in education that contribute to lower school performance levels. As I apply the minority relations framework, I will explore contextual factors including locales, social structures, socializing institutions, cultural contexts, and group histories to help comprehend the larger picture, or the situation that DemoDeaf is embedded in. In particular I will discuss how the family and school are socializing institutions in which deaf people indoctrinated with and internalize the stigma or negative perceptions about deafness.

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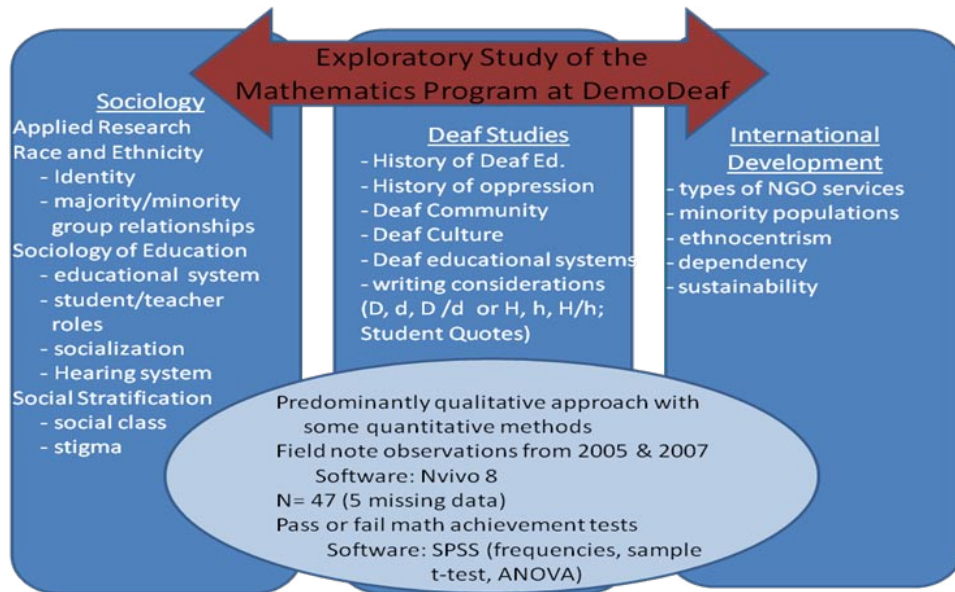
<sup>3</sup>When referring to DemoDeaf students I will use the term "deaf" for two reasons. First, many of the students in this study are minors and may not have developed a sense of political affiliation that the term "Deaf" represents. Second, Mprah (2008) explains that for many pre-lingually deaf persons in Ghana the ideas of a positive Deaf Identity or sense of "Deaf Pride" are foreign and almost unthinkable given the rampant stigma against deaf people in Ghana. However, when I refer to the Deaf Community and other Deaf advocates, I will use the term "Deaf" as they use the term as an expression of identity separating those who are only audiological deaf and not culturally Deaf.

By exploring the families of Deaf people and their interactions with Deaf family members, I engage in a discussion on the group history of Deaf People. Group histories are important to classroom performance because the histories indicate types of cultural resources, such as skills and habits (Farkas 1996), that have been passed down to the student to use in the classroom. In addition, group histories reveal the social and cultural capital to which a student has access (Ballantine 1997). Many students at the Demonstration School for the Deaf come from rural homes whose families financially struggle to send their Deaf child to school. Coleman and Hoffer (1987) show that lower income groups are less effective at socializing children because they have limited access to powerful social networks and do not instill productive attitudes or the “know how” for social mobility. The limited social and cultural resources are magnified when considering that the stigma against the Deaf often leave Deaf children ostracized from the family.

Brown et al. (2003) emphasize that social institutions in society are typically designed to accommodate the needs of majority groups rather than embrace diversity. Sociology of education literature also suggests that educational school systems often inhibit the learning of minority groups because the educational systems do not recognize the cultural differences and histories of minority groups (Ballantine 1997; Brint 1998; Ogbu and Simmons 1998). Instead, I will attempt to demonstrate that the purpose of DemoDeaf is not to provide a secular education for students, but that the hidden curriculum at the school only reinforces the low status ascription onto students individually and as a whole.

My approach draws upon research demonstrating that Deaf members of society are part of a linguistic minority who share many of the same characteristics and challenges as ethnic minority groups. The labeling of Deaf people as disabled does not mean the label is appropriate nor does it mean that it must follow deaf people into the eternities. Barth (1996) explains that people ascribe individual and groups into categories to help people to know how to interact with one another. However, he adds that although the practice of ascription is necessary for the purpose of interaction, it is not a science. The categorizations of individuals and groups are subjective, dynamic, fluid, and negotiated daily. Cornell and Hartmann (2007) build on Barth's conclusions and add that identities are "built, rebuilt and sometimes dismantled over time..." (pp. 75).

In addition, I draw from Deaf Studies literature that supports the use of race and ethnic minority relations to describe experiences of the Deaf (Charrow and Wilbur 1979; Lane et al. 1996). For example, Higgins (1980) illustrates the rich cultural resources of deaf people as a linguistic minority. These resources include a Deaf community with strict membership rules, a complex Deaf culture, and Deaf identity. This view contrasts with research dependent upon medical models of disability which suggest that Deafness automatically qualifies as impairment and warrants something to be "fixed" (Lane et al. 1996).



**Figure 1.1 Program Evaluation and Ecological Review: An Exploration of Cross Discipline Literature.**

### *Challenges Encountered at DemoDeaf*

Given the current status of Deaf Education in Ghana the challenges Signs of Hope interns at DemoDeaf encounter are unavoidable and go beyond the typical case of culture shock. The typical DemoDeaf classroom is not taught by a teacher fluent in GSL, the primary language of the students. As a result, there is limited communication between teacher and students in and out of the classroom, teachers have negative perceptions of their students, and the students have low literacy and mathematic ability. In addition, the interns may become overwhelmed and burned out as they face culture shock and the middleman position they assume because they understand GSL, are familiar with Deaf culture, and have positive perceptions of Deaf people. I will rely on participant observations recorded in 2005 and 2007 to explore these issues at greater length.

*Expectations for signs of hope interns in the classroom.*

As teaching assistant interns, Signs of Hope volunteers are expected to assist the teacher in the classroom by team teaching classes, grading workbooks, or monitoring students. In 2005 interns took on a greater role as a teacher in the classroom because at least six of the nine teachers at DemoDeaf did not regularly come to class on time or even at all on some days. Teaching Ghanaian/DemoDeaf curriculum is a difficult task for Signs of Hope volunteer because they have never studied it, nor do they have similar life experiences from which to draw examples students can relate to. Also, interns are still adjusting to GSL vocabulary.

The different cultures, histories, and locales of Ghana and the U.S. demand different emphasis in the curriculum. For example, General Science courses review the different kinds of cattle in Ghana and the areas in which they are found. However, the closest most Signs of Hope volunteers come to knowing about cattle is at the local grocery store where they buy packaged beef. Another example is Ghanaian Social Studies (GSS). GSS rightfully focuses on Ghana's youthful populations, Ghanaian exports, and other issues specific to Ghana. The expectation for interns to learn and master Ghanaian curriculum with the limited training is very demanding and unrealistic.

In addition to learning curriculum, interns are also missing the essential incidental information necessary to effectively teach DemoDeaf students. To illustrate lessons through examples students can relate to, interns need to familiarize themselves with the different histories, worldviews, cultural meanings, social artifacts, and language of the Ghanaian and Deaf student body as quickly as possible. Interns face the pressure of having to decide to study the material or to learn more about the culture or local and

national information. When interns decide to take the opportunity to converse with students to learn more about them and their life experiences, they learn what kinds of examples to use in class while simultaneously becoming more familiar with GSL.

Because GSL is a dialect of ASL, interns are able to understand much of what is signed. However, there are still signs such as FUFU and BANKU<sup>4</sup> that are new to ASL signers. These vocabularies must be learned before fluid conversations and class lectures can occur. This adjustment period can vary from intern to intern. Interns feel pressure to master the curriculum, become knowledgeable about cultural meanings and symbols and other local and national information, and to adapt to GSL signs as much as possible before they fly home at the end of two or three months depending on the internship length.

Conversations between Signs of Hope volunteers and students and volunteers and DemoDeaf teachers are helpful for interns to learn how to adjust to the Ghanaian and Deaf cultures and to the way of life at DemoDeaf. The students teach interns the signs of favorite foods and how to make them. Teachers answer questions on local and national issues. However, it is apparent that the teachers and students do not engage in in-depth conversations like they do with the interns. I realize it is not normal for students and teachers in many educational systems across the globe to engage in in-depth conversations. However, in the case of the DemoDeaf student, this lack of communication greatly affects teacher perceptions of their students and how they may treat them.

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<sup>4</sup> To preserve the statements made in GSL, a language with no written form (Johnston 1991), I have chosen to gloss over the signs instead of transcribing the signs into English

*Limited communication in the classroom.*

In 2005 I observed that six of the nine classroom teachers did not convey complete thoughts or sentences during class lectures. My experiences in 2007 only confirmed these observations, although I did see improvement in two teachers' signing abilities since 2005. Class lectures typically consist of a mix between spoken or mouthed English, Manually Coded English (MCE) signs, and some GSL. For example, one day in class I watched a teacher try to teach students how to use personal pronouns in sentences. The teacher expected students to write "I am eating." However, the students wrote on the chalkboard "I am eat." She corrected the students by signing in MCE, I AM EAT. When transliterated this means "I am eat." The teacher did not realize she was actually giving students the incorrect answer. Instead of correcting herself, she became more frustrated.

Another example of the limited communication in the classroom occurred when a teacher asked his class whether they understood the lecture he had just given. The teacher whispered the lecture in broken sentences to supplement the few signs he used. A couple of students shook their heads as they signed UNDERSTAND which means they did not. The teacher asked another student to stand up to review the lecture for his classmates. However, this student said he did not understand the lecture either. But the teacher did not understand him when the student said he did not understand it. After seeing the teacher did not understand what he, the student, just told him, the student shrugged his shoulders, smirked at his classmates, and proceeded to repeat what was written on the board in heavily-English influenced signing and finger-spelling. The teacher congratulated the student for a job well done when he sat down. Then the teacher looked to me as if congratulations were in order for "successfully" teaching his class.



After the teacher left, I asked the students if they really understood. They said they did not.

The teacher in this last instance was not familiar enough with GSL to notice that the answer given by the student showed nothing of comprehension, just recognition of a few words and their signs. An alternative explanation is that the teacher may have noticed that the students did not really understand, but he himself did not know what else to do. Furthermore, the teacher did not realize that he was actually a joke of the class; the students all chuckled to themselves fully aware that the teacher was clueless as to why they were laughing.

Signs of Hope interns are placed in an uncomfortable position as many teachers do not understand students in the classroom. Interns offer encouragement and positive reinforcement to teachers when they use new signs in class. They also listen to the students as they occasionally vent their frustrations for not having teachers in the classroom who are able to teach them. The situation becomes complicated when teachers are blatantly resistant to learning GSL. Generally, students claim that these teachers who refuse to learn GSL actually HATE DEAF. The choice of words and tone DemoDeaf teachers use to describe Deaf students, Deaf people in general, and the expectations the teachers have for them often reveal underlying negative attitudes. I will now discuss the negative teacher attitudes towards DemoDeaf students in greater detail.

*DemoDeaf teacher attitudes.*

In 2005 and again in 2007, teachers repeatedly describe students as “lazy” and make strong statements about how Deaf students are “incapable of learning.” One teacher explained that some teachers have lower expectations for Deaf students than they did for the hearing students they used to teach before coming to DemoDeaf. Another teacher said, “[Deaf students] think slower than hearing students and use shortcuts when speaking instead of using proper English.” Not only does this comment demonstrate the low expectations and negative perceptions of the deaf, but it also reveals how teachers are not educated about the nature of GSL. From observing teacher behavior and conversations like these, I believe some of the teachers at DemoDeaf would agree with the following perception stated by one teacher, “The Deaf actually make better vocational workers, but hearing students make better educated people.” Comments, attitudes, and beliefs such as these limit teacher expectations of students and also make it challenging for Signs of Hope volunteers to work with DemoDeaf teachers.

Student literacy, reading comprehension, and math ability appears to suffer as a result of the negative attitudes and lack of communication in the classroom.

*Literacy and reading comprehension.*

Reading comprehension in 2005 and 2007 was observed in most of the classes as the teachers for English, General Science, Agricultural Science, Social Studies, Leather Work, Religion and Moral Education, and Pre-technical Skills frequently write either the full lesson on the chalkboard or in tables with sentences written in them. This is a standard practice for two reasons. First, textbooks are limited in developing countries. Brint (1998) reports that for every one book, there are typically fifty people. Second, as

two teachers explained, teachers rely on student reading ability to supplement ideas and concepts the teacher does not know how to explain in GSL. There were a few instances in which entire lectures were written on the chalkboard without any further explanation by the teacher. When I asked several students to explain concepts written in their notebooks many students struggled and responded with one of two reactions. They either sign HARD while shaking their heads, meaning, “I cannot explain it, it is too hard.” This may not be too unusual for students in JSS in general. Or the students resort to heavily English influenced signs and finger-spelling to re-read what is written in their notebooks. However, this re-reading of words became a red flag signaling incomprehension. The students could “read” the words, but not comprehend them. These 13- to 22-year old students struggle to understand words such as *categories*, *population*, *specialization*, *acquisition*, *investment*, and *ethics*.

The limited communication in the classroom between students and teachers, and writing class lectures on the board without detailed explanations in GSL and on occasion, no explanations at all, makes learning difficult, if not impossible. For interns, curriculum on population growth, imports, exports, and other topics does not seem as urgent when considering the students do not know how to understand what they are reading. As I contemplated ways to teach literacy to students in 2005, I also discovered that mathematics was a subject students struggled with.

*Observed student math ability in 2005.*

I discovered students’ mathematic skill levels were very low as I tutored students in their regular math class exercises. These exercises consisted of factoring, division, and concepts such as *profit*. Many of the students first answered the exercises incorrectly, but

they usually came back with the correct answer. I learned students were engaging in something I call “answer sharing.” Answer sharing is different from cheating. Cheating may occur when students have access and opportunity to learn the knowledge they are tested on. In contrast, answer sharing is the result of having no or limited opportunity to learn about the subject and yet are still being tested on it. Answer sharing is not necessarily intended to get better marks, but is a coping mechanism and has the purpose of avoiding confrontations with those in power (teachers). The high use of answer sharing may also be an indicator that students feel little or no motivation or confidence to try to do the work themselves, or that answer sharing has become a cultural phenomenon at the school. Students sign answers to each other in class when a peer does not know how to answer. However, most teachers are not fluent enough to recognize that it is happening or do not know how to stop it.

I discovered several students struggled to perform single-digit addition exercises. I took these students aside one day and asked them to count to 100. Six of the students could not count past thirty-one. Later, I found that these students, as well as other students who could count to 100, struggled with addition. As I sat and observed students who I suspected did not understand the math exercises, I saw that they were acting like they were counting with their fingers but really had no idea what the correct answers were. For example, one student wrote the answer 7 for the equation  $9 + 9$ . Observing these students struggling with basic mathematics motivated me to focus on math in the classroom. However, by the time that I decided to focus on mathematics, a month and a half had passed by. The other two volunteers had already experienced some degree of

burnout and were no longer regularly teaching at the JSS. The math program I was beginning to develop had to account for the needs of Signs of Hope volunteers also.

*Volunteer burnout.*

The low literacy, reading comprehension and basic mathematics levels left volunteers searching for more appropriate ways to be of assistance to students and teachers. Frequent teacher absenteeism in 2005, negative comments about Deaf students' abilities and GSL, and teacher resistance to learning GSL made it difficult for volunteers to work with DemoDeaf teachers. The senior teacher approached me one day and asked where the other volunteers were. "Have we offended them somehow?" he asked. I tried to my best to give excuses for volunteer absence, and he eventually stopped asking. The two other JSS volunteers began focusing more on the Senior Secondary School for the Deaf in town, but agreed to return for the scheduled sign language classes during the week. However, the senior teacher mentioned that even then these volunteers did not always come. This left one fulltime volunteer (myself) at the JSS.

I realized that my role as a teacher assistant in the classroom was less effective given the differences in subject matter, my inexperience with local knowledge to draw examples from, the absence of student-teacher communication in the classroom, and the low student literacy and math levels. By identifying the challenges, however, I also uncovered the needs of students, parents, and teachers an effective program would have to address.

The students not only need a teacher who can understand and know how to use GSL, but they also need to be taught the basic fundamentals of reading and basic mathematics. Teachers need to be informed about the complexities of GSL by

introducing them to principles such as classifiers, body movements, and facial expressions. And lastly, Signs of Hope interns need a specific curriculum and kind of schedule they can be prepared to teach before arriving at DemoDeaf.

In attempts to develop a program that satisfied these needs, I tested the effectiveness of volunteers as interpreters in the classroom, and designed and implemented the Book Club and math program. I found that interpreting in the classroom was ineffective. For more information please refer to APPENDIX A. VOLUNTEERS AS INTERPRETERS IN THE CLASSROOM. I found the Book Club was effective but not easily sustained. Please refer to APPENDIX B. THE BOOK CLUB, for more details about this programs of Hope and DemoDeaf. The portability and flexibility of the math program made it ideal for students, teachers, and volunteers. Teaching students basic mathematics in hopes of helping them understand their current math homework better is feasible. In the next chapter I discuss how the mathematics program meets the needs of students, teachers, and interns at DemoDeaf.

## CHAPTER 2: THE MATH PROGRAM

In this chapter I will discuss the mathematics program I developed as an alternative program solution after discovering the Signs of Hope teaching assistant role was less effective in the classroom because of the lack of GSL fluency among teachers, low school performance levels among students, and inadequate intern training. The mathematics program is designed to address these issues and has quantitatively proven to increase student math skills level and qualitatively has proven to have positive effects on student confidence levels, increased student participation in their daily math class, and informed teachers about GSL and the life experiences of their students.

I chose to focus on basic arithmetic after finding six students out of forty-nine students could not count past thirty-one in 2005 and nearly all other students struggled with addition and/or subtraction. There are two important elements of the 2005 math program that made it successful. First, it encouraged a more student-centered teaching approach. Second, program mobility allowed volunteers to step into any class at any given time with an idea of what and how to teach that day. In 2005 this was really significant given the high absenteeism of teachers in the classroom. After conducting an analysis of the program I modified the program in hopes of improving it and implemented the new version in the summer of 2007.

The 2007 math program differed from the 2005 program in three ways. First, I included a series of pre and post math achievement tests to measure overall program effectiveness. Second, students were grouped according to math ability (counting, addition, or subtraction). Each group was led by one of three interns in the classroom. The third change occurred under the direction of the DemoDeaf headmaster. The

program was designated by the headmaster as an after-school program held after supper since teachers were attending more of the classes they were assigned. I will discuss the specifics of the 2005 program in this next section because it supports the 2007 math program design. After explaining the 2005 math program I will go into greater detail about the 2007 math program.

### *The 2005 Math Program*

In 2005 a total of forty-nine 12 to 24 year-old students from the Junior Secondary School (JSS) participated. During my initial observations I learned that student ability ranged from counting to basic division. In order to teach students effectively at their pace and at their level, I needed to know the math ability of every student. The first step was to assess individual student math skill level. The students who could not perform simple addition were asked to count to one-hundred in a room separate from the other students (usually in the library with the librarian present or in the cafeteria when classes were in session). Other students were given addition and/or subtraction worksheets to gauge student math skills and also to keep track of student progress throughout the program.

Each student who could not count to one-hundred was given one-on-one tutoring through a system I developed to teach counting. Together, we wrote out on lined paper a chart starting from 0 to 9 on the first line, 10-19 on the next line, 20-29 on the line after that, and so on until we counted to 100. To help the students see counting patterns, I color-coded the columns where numbers were the same, such as 7, 17, 27, 37, and so on. On the margin of the ones column I wrote ones. Next to the tens row I wrote tens, then twenties, and so forth. Upon completion of the number chart, the students and I together read off the numbers in GSL after which the students wrote the number chart again. I



learned that after students counted manually by themselves, with me, and then again on paper a total of 5 times, they usually learned to count on their own.

Ones	0	1	2	3	4	5	6	7	8	9
Tens	10	11	12	13	14	15	16	17	18	19
Twenties	20	21	22	23	24	25	26	27	28	29
Thirties	30	31	32	33	34	35	36	37	38	39
Forties	40	41	42	43	44	45	46	47	48	49
Fifties	50	51	52	53	54	55	56	57	58	59
Sixties	60	61	62	63	64	65	66	67	68	69
Seventies	70	71	72	73	74	75	76	77	78	79
Eighties	80	81	82	83	84	85	86	87	88	89
Nineties	90	91	92	93	94	95	96	97	98	99
Hundreds	100	101	....							

**Figure 2.1 Student Counting Chart: Practicing Counting with GSL and on Paper in 2005**

The worksheets used to keep track of student progress and student levels came from addition and subtraction worksheets I found in a pile of donated materials. These were composed of 72 single, double, or triple-digit problems per page. After making a few copies I cut the page in half and labeled the parts “A” and “B.” Part “A” was composed of 40 problems while “B” was composed of 32 problems. The “A” sheets were given to every other student while the “B” sheets were given to the remaining students. The same pattern of worksheets “A” and “B” were repeated for subtraction.

As each of the students completed the worksheets the problems were corrected and then handed back to the students. Every incorrect answer had to be redone by the student. If the students missed five or more, they were marked in the grade book as struggling. By recording student progress, both the student and I both could monitor how they were doing and I would always know what the students were working on. Only after redoing the incorrect problems did the student receive the next worksheet. I did

have a couple of students work on single-digit division and multiplication, but this was before I discovered even these students struggled with triple-digit subtraction and double-digit multiplication.

I used class demonstrations, exercises, individual worksheets, and group study sessions to teach addition and subtraction. Flashcards and other class games also stimulated interest in math and studying. Students were grouped according to the operation on the worksheet that they were currently working on. Students used pebbles, bottle caps, and chalk marks on desks and even arms to practice counting, addition, and subtraction. A variety of teaching methods was used with the hopes of keeping student interest and to cultivate student enjoyment in learning.

Cheating in my math classes was minimized as I informed students that the consequence for cheating was to mow the farm grass.<sup>5</sup> Students do not like this chore since it is done with a machete and is very laborious. A few students tested me to see if I would actually follow through. Once they learned I was serious, they paid more attention in class, focused on their own work, and even orchestrated individual and collective ways of showing me appreciation for the time I spent with them.<sup>6</sup>

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<sup>5</sup> Note that once students are given an opportunity to learn through an accessible language, student exchanges of answers is distinct from answer sharing and is considered cheating. Also, mowing the grass at DemoDeaf involves the use of a machete, not a motorized lawn mower.

<sup>6</sup> For more details please turn to APPENDIX C. CONSEQUENCES FOR CHEATING

*Observations from the 2005 math program.*

After I decided to help students with math I continued to document my observations of the students when they counted or attempted to solve an arithmetic exercise. After discovering six students could not count past thirty-one I asked a student from the nearby Senior Secondary School for the Deaf why thirty-one was a significant number. The student looked at me like the answer was obvious. He explained that students learn to count up to twenty-nine or thirty-one because that is how many days there are in a month.

The students who struggled to count past thirty-one counted as follows, "...3-10, 3-11, 3-12, 3-13, 3-13..." This may be because the students are observing how other students count in the pattern above-- ...20, 1, 2, 3, 4...8, 9, 30... Or the students recognize the pattern of 11, 12, 13, 14...19 before reaching 20 and are simply attempting to do the same to reach 40 and so on.

Many students struggled with similar aspects of addition in 2005 (and 2007). For instance, many students did not have simple addition answers such as  $5 + 8 = 13$  memorized. Instead, students made small chalk marks on desks or their arms or pencil marks on paper and then count them up making the addition process very tedious.

Because it took me nearly two months to assess the needs of the students, teachers, and volunteers, I did not have much time left to run the math program. Although there were about four weeks left, students were also preparing for their annual national exams and also cleaning the campus for a PTA meeting. This did not leave as much time as I would have preferred to work with students on addition and subtraction.

However, the students who could not count past twenty-nine or thirty-one were able to by the time I left.

Three important program features were real strengths and contributed to the success of the math program. First, students were able to learn the basics of arithmetic at their own pace. To help students feel less pressure and frustration with math, I tried to keep it as fun as possible and tried to give one-on-one tutoring as much as possible. Second, the flexibility of the program gave me, a Signs of Hope International volunteer, something to teach at any moment. I kept a notebook, chalk, and flashcards in my backpack at all times so when the opportunity came to teach the students, I was prepared. Students learned that if I was in their classroom it was time to practice basic mathematics. Third, because I always knew what I was going to teach at all times, I was able to talk with teachers more about GSL, about the sophistication of the language, and to answer any questions teachers had at any given moment.

After I arrived home from Ghana I continued to think about the program and the students at the school. I wrote a couple of papers about my experiences there as an undergrad and gave several presentations. During this time I was working on finding ways to improve the program. As I explained earlier, I came to believe that the students and the math program would benefit greatly from formalizing the math program, increasing the number of Signs of Hope Interns from one to three, and by adding a system to more accurately monitor student progress. In December of 2006 Signs of Hope International asked me act as the summer coordinator and field facilitator for the 2007 mission. I accepted this invitation and later received permission from the organization to implement the math program with these changes.

### *The 2007 Math Program*

In 2007 a total of 47 students were present at the JSS at the time. Three students were on a leave of absence due to medical problems and the JSS3 class had completed the school year. Student ages ranged from 13 to 22 years old. The 2007 math program was formalized and implemented as an after-school program with a few changes. In 2005 I observed a seemingly natural three-way divide between students in the classroom according to counting, addition, and subtraction. I decided to continue following this natural grouping of students together in the new modified version of the math program. However, I added two more volunteers in the classroom to act as group teachers. The benefits of having three volunteers in the classroom are numerous. Students benefit from the smaller group size, group demonstrations, more one-on-one tutoring, and supervised peer tutoring. Volunteers also benefit because the program allows them to create a lesson plan and formulate expectations for the day's work.

In addition to changing the program to an after-school program headed by three volunteers, student achievement tests were also administered for student group placement and to monitor student progress. Student achievement tests measured student ability in counting as well as single-, double, and triple-digit addition, subtraction, multiplication, and division. I eliminated multiplication and division from the program after having only six students successfully compute single-digit multiplication and four students successfully divide single-digit numbers and then finding that these same students struggled with double and/or triple-digit addition and/or subtraction. Because the aim of the program is to help students learn or re-learn basic fundamental math and to master it,

I decided to place those students who could multiply or divide single-digits in groups where they would master addition or subtraction first.

During the assessment phase math achievement data were gathered through math achievement pre-tests. Tests cover counting, and single-, double-, and triple-digit addition, subtraction, multiplication and division. Counting pre and post testing included having each student count to one hundred in GSL and then again in English written form in five minutes or less. Every student was tested for single-digit addition, subtraction, multiplication and division, even those who cannot count to 100. The remaining tests consist of at least ten problems. Students were considered proficient if tests were completed with 100% accuracy. However, if a student did not correctly answer single-digits tests, double and triple-digit tests were not administered to the student.

Students first copied the problems onto a separate piece of paper and then wrote the answers on this separate sheet. When one test was completed and the intern saw that the student had answered with 100% accuracy, the next test was given. After a few students asked for scratch paper volunteers began to give scratch paper to every student to use as they wished. Students were given tests until they were not able to answer all of the questions correctly. Volunteers recorded how far the student counted and any other interesting patterns students exhibited while counting.

Because the initial tests were an assessment of student math skill level, it was important to deter answer sharing. To deter answer sharing as observed in 2005, pre-testing was administered in an isolated room with only one other researcher and student. A third researcher remained with the class gaining student trust while playing getting-to-know-you games. Once one student was finished testing, he/she returned to class and

sent another student in. In 2007 the assessment period took longer than expected so the third intern was brought in to help with pre-testing.

Post-tests were the achievements administered to students after they have been grouped by achievement level and have received more instruction. These tests determine whether a student moved up to the next level (single, double, or triple-digits) and groups (counting, addition, and subtraction). In 2007 the last tests were administered just before volunteers departed Ghana on July 12.

Two unforeseen factors reduced the amount of time the after-school program was held at the school. First, I discovered we had less time to tutor and work with students during the day because the teachers were more consistently in their classrooms. This was a vast improvement from 2005. Second, nationwide electricity rationing limited the program to only two or three nights per week throughout our stay because it was too dark in the evening to teach without electricity.<sup>7</sup> This meant that students could only participate in the program once during the week. However, we did go to the schools during the day and tutored students whenever possible, usually when students had finished their class exercises and before the next teacher came into the room.

*Observations from the 2007 math program.*

Throughout the 2007 program my two research assistants, Amanda Madsen and Lara Leigh Whitney, and I recorded our observations of the students, teachers, and the role of the math program. Recorded observations included common mistakes made by

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<sup>7</sup> An interesting side note, an organization did donate a generator to the school, however, the school could not afford to continue to replenish the fuel needed to power the generator.

students, learning patterns, and methods that were developed to teach the students. Next, I will discuss the observations in greater detail that were recorded during the assessment phase and throughout the duration of the program. These observations provide more details about actual student ability, the current state of student ability at DemoDeaf, and the student-centered teaching approaches used in the math program. This review suggests what teaching techniques appear to work well at the school or not at all.

During the assessment phase, we observed differences in GSL and ASL signs for some numbers. For instance, the sign for 16, 17, 18, and 19 in ASL begin with a ten and end in a six or seven or whatever the second digit is. To sign 16 in GSL one makes the GSL or ASL sign for six but the pinky quickly slides down the surface of the thumb twice. The number 17 is signed by making the GSL or ASL sign for seven and then tap the ring finger a couple times on the thumb. The pattern continues through 19.

Another pattern observed when students were counting 20-30, 30-40.... Students count “20, 1, 2, 3, 4, 5, 6, 7, 8, 9, 30, 1, 2, 3, 4, 5...” This pattern continued until the counters reached 100. At first the volunteers thought the students were mumbling since it can be tiring to count 1-100 manually. However, because so many students counted in this same pattern even when in separate rooms, volunteers began to wonder if this pattern was related to some linguistic rules the volunteers themselves were not aware of. This pattern of counting did lead students to make similar errors when they lost track of where they were in the counting process. By signing 1-9 between the twenty, thirty, forty, etc., the signers often forgot if they were counting in their 60’s or 70’s. Other students would even count something like “70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 6, 7, 8, 9, 80...”



Ones	0 1 2 3 4 5 6 7 8 9
Tens	10 11 12 13 14 15 16 17 18 19
Twenties	20 21 22 23 24 25 26 27 28 29
Thirties	30 31 32 33 34 35 36 37 38 39
Forties	40 41 42 43 44 45 46 47 48 49
Fifties	50 51 52 53 54 55 56 57 58 59
Sixties	60 61 62 63 64 65 66 67 68 69
Seventies	70 71 72 73 74 75 76 77 78 79
Eighties	80 81 82 83 84 85 86 87 88 89
Nineties	90 91 92 93 94 95 96 97 98 99
	100 101....
Hundreds	100 200 300 400 500 600 700 800 900
Thousands	1000 2000 3000 4000 5000 6000 7000 8000 9000

Figure 2.2 Student Counting Chart: Practicing Counting with GSL and on Paper in 2007

A reliability test was conducted in the middle of the assessment phase to check if the students understood us, the interns/researchers, and if we understood them. To get to know the students each of the researchers asked the students questions about their family, their age, and how old they were when they became deaf. Each volunteer re-interviewed five students each to see if we all received the same response. The reliability test showed that we received the same answers at least 90% of the time.

Student counting skills were tested the same way as in 2005. First, students count one through 100 in GSL and then again in written English. Counting one to 100 on paper is important because some students may have become deaf after having already attended hearing schools. These students may know how to count to 100 on paper, but may not know how to count to 100 in GSL. We did find one boy who fit this description.<sup>8</sup>

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<sup>8</sup> We notified Samuel, the Deaf librarian, and he took the student aside that same day and taught him to count to 100 in GSL.

In 2007, I continued the use of the counting chart that I developed in 2005. However, I added two more lines to the numbers chart, counting by 100's and 1000's. A week into the counting group students began to be tested on counting by threes, fives, tens, 100's, and 1,000s before moving on to the addition group. I brought with me some more teaching materials and learning games for students to use as they learned to count.

A collection of folder games had also been donated to the math program by an organization in the U.S. before I left for Ghana in 2007. These folder games had counting games such as count the clusters of bananas or match the number of bananas to the numerical number. I also had students count the total number of bananas in a row and the total of bananas on the folder game itself for more counting exercises.

I also had students, individually or sometimes in groups of two, count how many beans were in little pouches that had been also been donated by another service organization. One student counted the fractions of beans. The day-time math teacher was actively teaching them fractions at the time. One negative result of counting beans was that it made some students hungry—a few students asked if they could eat them. For this reason using beans in class to practice mathematics may not be appropriate in the future.

Similar to observations in 2005, students relied on fingers, chalk marks on desks, arms, and paper to add. This made addition very tedious, especially long addition. To help students speed up the addition process several teaching methods were incorporated into the program to stimulate student learning engagement and memorization. These teaching methods included group demonstrations, one-on-one tutoring, games and even the use of flashcards. An intern at the primary school suggested teaching students to

count by two's, three's, or five's to help students speed up the process of adding. This is when I decided to include counting by threes, fives, tens, hundreds and thousands in the counting group before advancing them to the addition group.

Another area students struggled with was the concept of carrying over when adding double-digits. For example, when adding  $27 + 38$  students would answer 515 instead of 65. To correct this the volunteer responsible for facilitating the addition group gave demonstrations and had the students show more work directly on the workbooks they turned in, not on scratch paper. This was helpful because students often miscopied answers when they were trying to hurry.

Students also exhibited common misunderstandings and mistakes when performing subtraction operations. The concept of borrowing numbers when subtracting larger numbers was especially difficult for some students to grasp at first. For example, when subtracting 474 from 540 students would be stuck at the 0-4 and write 4 as the answer instead of 6. To help students understand how to borrow when subtracting, Amanda Madsen, Signs of Hope International intern and also one of my research assistants, first had students write out their work in their workbooks. This was slightly difficult to get students to do because they were used to working on scratch paper and turning in assignments separately. As students started showing their work, they began to answer more of the exercises correctly. Writing the work out also helped the interns see other areas the students were confused with.

Madsen also discovered many of the students did not recognize what the plus, minus, or multiplication symbols meant. Some students tried to do all three functions on one worksheet of subtraction problems. She focused on distinguishing the differences

between the plus and minus symbols for a couple of group sessions. She created exercises to practice what she had taught them. For example, one exercise required students to insert the correct symbol into the equation such as in  $10 \underline{\quad} 7 = 3$ . As a group facilitator for subtraction, Madsen answered problems with students on the chalkboard, facilitated one-on-one tutoring, peer tutoring, math games, and timed tests.

Students appeared to react well to Signs of Hope volunteers and the math program in 2007. Students were encouraged to do their own work, and the flexibility of the program was maintained. Volunteers were able to implement the program on a minute's notice and were able to adjust the program to fit the needs of the students through one-on-one tutoring, group work, group demonstrations, and games.

In the next chapter I will discuss analyses of the pre and post tests that were used to determine if the math achievement levels among students significantly improved. Background characteristics such as age and gender are also examined as I search for any possible learning patterns among students. In addition I will exam the field notes to explore how student confidence levels, student participation in the daily math class, and other teacher perceptions may also have been affected.

## CHAPTER 3: QUANTITATIVE AND QUALITATIVE ANALYSES OF THE MATHEMATICS PROGRAM

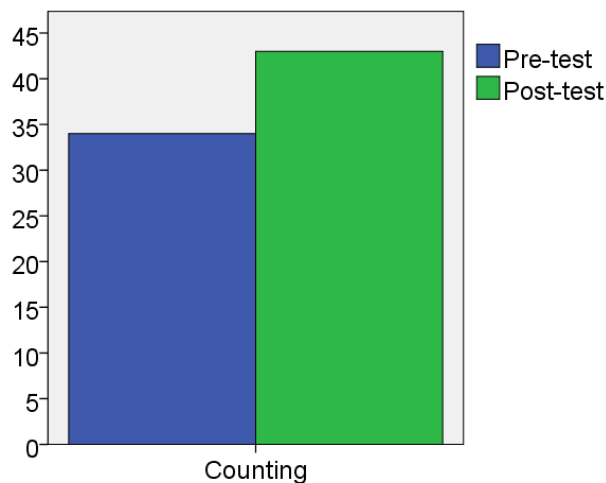
The mathematics program has proven quantitatively and qualitatively to have positive effects on DemoDeaf students and teachers. A paired-samples t-test revealed a significant difference in the cumulative pre-program test scores (pass or fail) and the post-program test scores,  $t(44) = -5.572, p < .01$ . The mean of the total post-testing scores after the program ( $M = 4.07$ ) was significantly higher than the mean before the program ( $M = 2.91$ ). In addition, no differences in math ability were found between males and females or between age groups. Qualitative data reveal the program had a positive effect on student confidence levels, student participation in the day-time math class, and teacher perceptions of DemoDeaf students. In this chapter I will discuss the quantitative and qualitative findings at greater length. First I will discuss the analysis of the single-, double-, and triple-digit addition and subtraction achievement tests. Then I will discuss my analysis of researcher observations and informal interviews with students and teachers.

### *Quantitative Analysis of Math Achievement Tests*

#### *Counting achievement tests.*

At the beginning of the 2007 program, only thirty-four of forty-seven students tested successfully counted to 100. Of the thirteen post-tested, ten successfully counted to 100 in GSL as well as written English in five minutes or less. Another student decreased the amount of time to count from twenty-two minutes to eight. One student struggled to count even after hours of individual tutoring from interns and students. This

particular student was recognized by peers as very capable outside of class, but during class she was “ignorant.”



**Figure 3.1 Number of Students Proficient in Counting in 2007: A Comparison of Before and After Counting Achievement Tests**

A paired samples t-test reveals a significant difference in the counting scores (pass or fail) before and after the mathematic program,  $t(46) = -3.301, p < .01$ . This indicates that the mean number of students who passed the counting test after the math program ( $M = .91$ ) was significantly higher than the mean before the program ( $M = .72$ ).

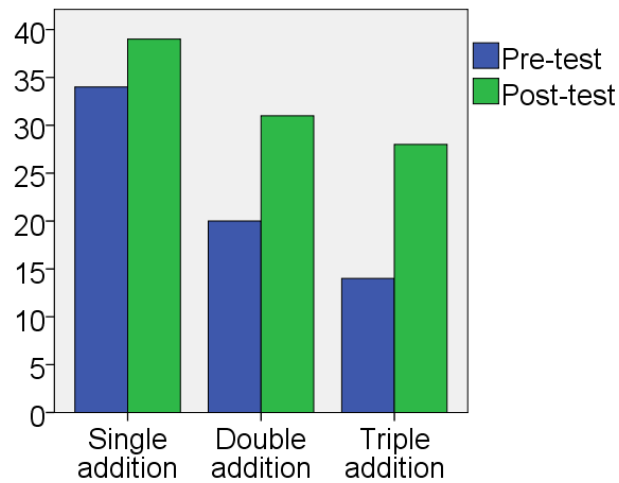
Other interesting observations include that five of the thirteen students who could not count to one-hundred could add single-digit numbers. This is possible since the highest number one needs to be able to count to when adding single-digits is eighteen. Also, five students in the 2007 counting group had also been in the 2005 counting group two years prior even though each of these five students was able to count to one-hundred by the time volunteers left DemoDeaf in 2005. Again, four of these five students tested proficient by the volunteer departure date in 2007. This discovery presents problems of

short term improvement and sustainability. After speaking to the math teachers about this development, he suggested that the daily math classes begin with counting and basic arithmetic reviews.

*Addition achievement tests.*

An analysis of the addition achievement test results indicate students advanced a total of twenty-nine levels; four students learned to add single-digit numbers together, eleven students learned how to add double-digit numbers together, and fourteen students learned how to add triple-digit numbers together. Students mastered this basic arithmetic during the mathematics program.

All students are considered to be proficient once they are able to answer a ten question achievement test with 100% accuracy. The number of students proficient in adding single-digit numbers increased from thirty-four students to thirty-nine, and the mean changed from .72 to .83 with a *p-value* <.05. The number of students proficient in double-digit addition increased from twenty to thirty-one and the mean increased from .43 to .66 with a *p-value* <.01. And the number of students proficient in triple digit addition doubled from fourteen students to twenty-eight increasing the mean from .3 to .61 with a *p-value* of <.01. Students also showed improvement in subtraction.



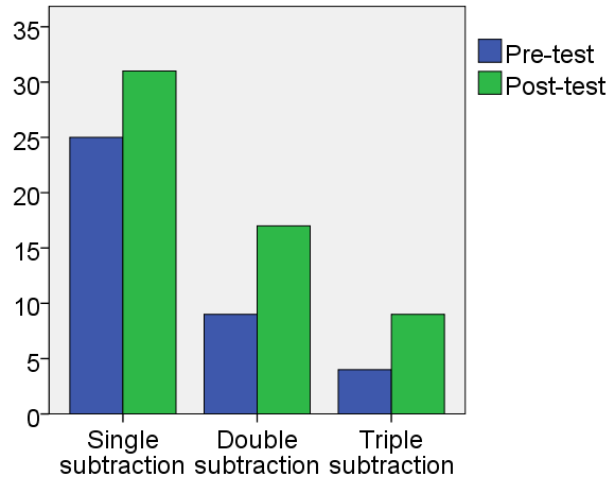
**Figure 3.2 Number of Students Proficient in Addition in 2007: A Comparison of Before and After Addition Achievement Tests**

*Subtraction achievement tests.*

An analysis of the subtraction achievement tests indicate students advanced a total of nineteen levels; six students learned to subtract single-digit numbers, eight students learned how to subtract double-digit numbers, and five students learned how to subtract with triple-digit numbers.

At the beginning of the 2007 program only twenty-five of the forty-seven students were able to subtract single-digit numbers from other single-digit numbers. By the end of the program, this number increased to thirty-one and the mean increased from .53 to .66 with a *p-value* of <.01. The number of students proficient in double-digit subtraction increased from nine to seventeen and a change in mean from .2 to .35 with a *p-value* <.05. The number of proficient in subtracting triple-digit increased from four to nine, however, this increase was not proven to be statistically significant.





**Figure 3.3 Number of Students Proficient in Subtraction in 2007: A Comparison of Before and After Subtraction Achievement Tests**

### *Analysis of Background Characteristics*

#### *Student gender.*

There were twenty-six male participants and twenty-two female participants in the math program. The results from independent t-tests indicate no significant difference in performance between female and male students on any of the achievement tests. Both male and female students in this study have comparably low math performance levels. This is similar to Wilmot's (2001) findings in a study that sampled hearing boy and girl students in central Ghana.

The fact that there are no significant differences between male and female students and math performance is interesting given that Ghana's strong patriarchal tradition has the potential to lead parents (or guardian given the popular practice of fostering children) to invest more in educating sons than daughters (Lloyd et al. 1994). This also contradicts studies of resource dilution that suggests parents or guardians invest

more in their son's education (Lloyd et al. 1994) because parents expect he will be the income provider when he is older.

*Student age.*

The mean age of program participants in the study is 16.72. An ANOVA test showed no significant differences in performance among age groups. The assistant headmaster did explain students are not necessarily divided into grade levels based on age but on the number of years in school (including hearing schools before becoming deaf). He also informed me that DemoDeaf has begun to accept only students who are primarily eight years or older into the school because they require less supervision and can help with personal and school chores. This is a real consideration for DemoDeaf because they are understaffed with only three house mothers to take care of more than 250 students.

Math achievement test analyses are limited to paired-sample t-tests and independent sample tests because of the small number of participants (forty-seven) and the varying number of tests administered to each student (between two and five), the unavailability of a control group, and the math mastery pass or fail grading criteria<sup>9</sup>. Assessment tests on multiplication and division were administered to students but because no students were placed in the multiplication or division groups, there are no post-testing results to analyze. Double-digit tests were given only to students who had

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<sup>9</sup> Pass or fail grading criteria in this study is used because I had to find measurements that were not too complicated given that I had extra responsibilities at DemoDeaf as the group facilitator for Signs of Hope International.

proven to be proficient in single-digit addition or subtraction. Similarly, triple-digit tests were given only if students were proficient in double-digit addition or subtraction.

Students were grouped by counting, addition, and subtraction ability as demonstrated with math achievement pre-tests. Within each group Signs of Hope interns facilitated student learning by providing group demonstrations, one-on-one tutoring, and peer tutoring. To advance from single-digits or double to triple-digit addition or subtraction, students had to pass exit math achievement tests given at the end of every math session.

### *Qualitative Analysis of Researcher Observations and Informal Interviews*

#### *The math program and student confidence.*

Students at DemoDeaf appeared to have low confidence levels in math ability. Indicators of low self confidence included the prevalence of student negative self-talk and the high frequency of answer sharing among students. Students often resisted answering problems with interns by explaining that they are IGNORANT, BLIND, or that it is too HARD. These responses may be typical for some students in this age group. That students consistently answer exercises incorrectly when they do try, however, suggests that students may not want to attempt solving arithmetic exercises as they may already expect to fail. The frequency of answer sharing may also indicate that the students expect to fail and do not want to or do not believe they can answer the problem correctly. I must note, however, that another possible reason students may practice answer sharing is that it may be a culturally valued means of interaction that may not have as much to do with a lack of self-confidence.

Dividing students into groups by ability did not seem to have negative effects on students because there were nearly equal numbers in each of the groups, and they all had friends in the group. Students usually smiled and hurried back to their classrooms to tell their friends after receiving their group assignment. Students assigned to the counting group did seem more eager and excited to start the program than students who already knew how to add and/or subtract.

There are four mechanisms built into the program that appear to prevent the decline of student self-confidence. First, students could not compare who finished first or who may have struggled the most during the assessment tests because they were administered in separate rooms. Students may have been tempted to compare test taking time, but assessment times differ by students as each were also casually interviewed by the intern and shared information such as their age, family size, and other things they like to do. Second, to avoid testing students beyond student ability, the number and level of difficulty of tests varied according to demonstrated student ability. Students who were not able to add single-digit numbers together were not given double- or triple-digit addition tests. Third, students were asked to tutor each other or act as teacher aides. As students had the opportunity to demonstrate their knowledge, the hope was that they would recognize that they do understand a lot and would begin to expect more from themselves. Fourth, all interns used positive reinforcement, constructive feedback, and encouragement in math groups. For instance, interns focused on the progress students made such as decreases in the amount of time to count or number of errors on their worksheets

In addition to the built in mechanisms there were a few other intern traits or teaching techniques implemented to prevent the decline of student self-confidence or even actually promote students' self-confidence. These other confidence boosts varied by interns and their personality. For example, at the beginning and end of every class, Whitney had the addition group repeat several times statements like ME CAN and ME BEAUTIFUL (meaning "I can" and "I am beautiful" in English). At first the students took this exercise lightly, giggling and looking down at their desks. Toward the end of our time at DemoDeaf, however, students appeared to believe what they were signing. Instead of looking down, they had big smiles on their face and pride in their eyes.

Another intern attempted to strengthen students' self-confidence by making a conscious effort to ask students who were struggling in their math group for cultural information and advice on how to do certain chores at home. This was done with the hopes that as students shared their knowledge they could be assured that the intern believed in their abilities and that individual worth does not solely rest on math ability. By helping students increase math skill level and individual self-confidence, we also hypothesized that this experience would positively affect student participation in their day-time mathematics class.

*The math program and student participation in day-time math class.*

Both math teachers explained that the students did begin participating more in class after the math program began by actually attempting to perform calculations on their own. The two teachers reported that students were shying away less of often and had been doing more of their own work. One teacher exclaimed, "Even [Aduwa] is

trying!” Answers computed by students were not always correct. However, getting the students to participate brought them one step closer.

Student test scores from the day-time class are not used in this analysis for two reasons. First, students were not given tests on the same subject twice. Teachers teach one unit then move on. And second, the students are so far behind in math skills, as demonstrated by their achievement tests, and school tests that it is very unlikely that improvement made from participating in the math program would necessarily be reflected in test scores taken in their day-time math class. The results from a math test that were posted in one of the classrooms showed that only two students out of 16 passed the test with “fair” and “weak” scores. As teachers began to see students trying harder in class and started learning more about their students from interns, it appeared that teacher perceptions of students began to become to improve.

*The math program and teacher perceptions.*

One of the benefits of the mathematics program was that it freed interns to spend more quality time with teachers. Interns always knew what they would be teaching in their math groups and did not have to spend as much time studying new material. Interns now had more time to talk with teachers, observe teachers in their classes, provide GSL feedback, and to help teach classes when invited. A result of the time interns spent with teachers, teacher perceptions of student ability appeared to change because they learned more about the sophistication of GSL and about the students through conversations and by watching interns help teach in their classrooms. For example, I saw how one teacher had students sign sentences with while using only one handshape to occasionally review GSL signs. (This teacher had a positive attitude toward Deaf people already). He was

shocked and surprised when I informed him that what he and his students were signing was actually a form of ASL poetry. If I had not started the math program and was still trying to learn Ghanaian Social Studies, I may have never had the time to observe his class or have known to tell him about that form of poetry.

Another example occurred in 2005 when students were taking the national exam. Students did not understand some of the questions and the teachers became irate. The teachers became angry and scolded the students for not understanding one question in particular even though it took four teachers to interpret that same question. One teacher approached me and expressed her frustrations that the students could not answer the questions after she had taught them. She first accused the students of being lazy. But as we spoke and discussed the language differences between teachers and the students, her facial expressions softened. She even said that she then understood how the students need to be first taught the basics such as reading and also class material in their own language before they can understand it.

Teachers also began to learn the importance of facial expressions, body movements, classifiers, and use of space for GSL by watching interns teach. One day a teacher wrote information on the board about how to prevent the spreading of AIDS and read it back to them verbally with a few signs. The sentences on the board started with, “Communicable diseases...” Students were not responding to the lecture. Finally, a Deaf Signs of Hope intern stood up and reviewed the lecture with the students using strong GSL or classifiers, facial expressions, and space. Students asked questions about AIDS such as, “If I share a bowl of fufu with someone with AIDS, will I get gets?” Teachers started gathering around the window and door of the classroom exclaiming, “They

understand! They understand!” Unfortunately, after seeing how well the Deaf intern was signing, several of the teachers automatically said they will never be that good with GSL.

To measure program effects on student confidence, student participation in the day-time mathematics class, and teacher perceptions of students, observations were recorded by myself and two other research assistance, Amanda Madsen and Lara Leigh Whitney in 2005 and 2007. The observations and informal interviews were coded and analyzed with the assistance of NVivo 8 software.

The coding scheme I used to assess impact on student confidence includes nodes on engagement/participation, observations of students, interaction nodes between students and teachers, volunteers, and other students. I used the student engagement node to look for instances where volunteers or teachers noticed a change in the frequency of participation among individual students as an indicator of increased student confidence. However, increased confidence may also be a result of feeling more at ease or comfortable with Signs of Hope volunteers or even the different teaching strategies and techniques volunteers institute in class. For this reason, other interaction nodes on how students interacted with teachers, volunteers, and peers are also analyzed for changes in interaction type. The effects of grouping students according to math skills on confidence was determined after considering the reactions of students upon receiving group assignments and other comments made about the other groups throughout the duration of the program.

Other nodes were created to capture student participation in the day-time math class and teacher perceptions and attitudes. To assess whether student participation in the day-time math class was affected, the documented informal interviews with math



teachers were coded under the node ‘voiced observations by teachers.’ Observations that revealed teacher perceptions and attitudes toward students in conversation and behavior were coded under nodes such as ‘teachers and sign,’ ‘teacher attitude,’ ‘voiced observations by teachers,’ ‘teaching strategies,’ ‘teacher centered,’ ‘student centered,’ and other interaction nodes. These nodes were helpful in gaining insight about how teacher perceived students and GSL, teacher attitudes toward students, and whether teaching strategies were affected by Signs of Hope volunteers or the math program.

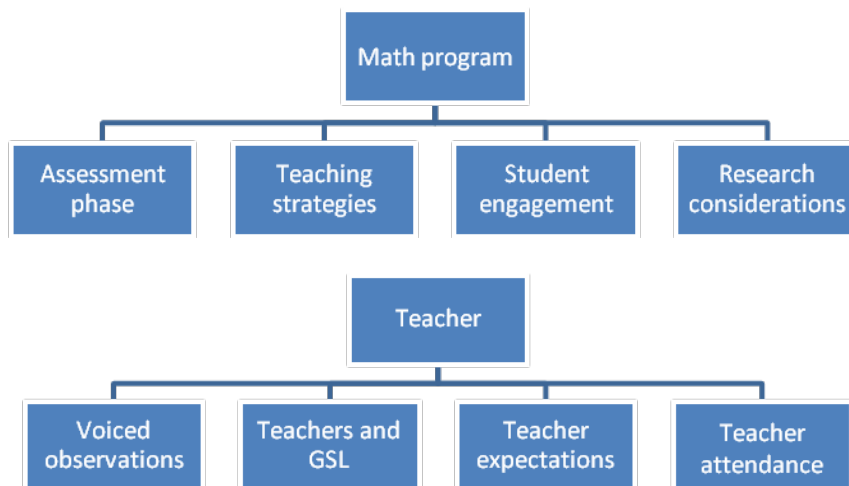


Figure 3.4 Tree Node Coding Examples for 2005 and 2007 Participant Observations

In summary, the mathematics program also helped DemoDeaf students significantly increase math skills. In all, math skills improved by fifty-nine levels total (student advancement from counting to addition, single-digits addition to double, double to triple, etc.). Even students who did not progress a single level improved in other areas such as beginning to actually participate in the daily math class. Program impact can also be seen in the effect on students in other ways, such as improving confidence of students and teacher perceptions.

From this analysis of researcher observations and informal interviews with students and teachers, we can conclude that the mathematics program was effective at strengthening student self-confidence and increasing student participation in their day-time mathematics course. Also, teachers' perspectives on their students and GSL changed over time because the interns had time to talk with teachers when the program was not in session because they are not too busy planning lessons for their next class. We can also see that the math program satisfied the needs of the student by working towards strengthening their basic math skills. The program also addresses the needs of teachers as they needed to learn more about GSL and Deaf student potential. And last, but not least, the program also helped interns by providing a set curriculum and plan on how they can be of help at DemoDeaf.

The program was also effective as a result of the increase in student-centered teaching used by interns in the program instead of the more traditional teacher-centered approach where teacher/student interaction is limited and class time is spent primarily in lectures. Student-centered teaching strategies included group discussions and demonstrations, group work, peer tutoring, instant feedback, positive reinforcement, and achievement tests.

Interns used group discussions and demonstrations based on actual student knowledge, skill level, and language instead of mandated curriculum and a mixture of English and broken GSL signs. As interns did so they also checked student comprehension by asking open-ended questions about the material and asking the students to say in their own words or demonstrate on paper what they learned that day. Using group work as a student-centered teaching strategy proved to be effective in

stimulating student interest and promoting peer tutoring. Student interest increased as students demonstrated by moving their desks so they could see each other sign, and could challenge and race each other to see who could finish or stump the other first.

Peer tutoring was beneficial for students as they found simpler examples their peers could relate to more easily. For example, to add ten plus seven the students would begin counting with ten and then count eleven on the thumb, twelve on the pointer finger and so on until you have added with seven numbers. This peer tutoring was especially important as Deaf teaching Deaf is a valued form of interaction within Deaf culture. Deaf students have learned to depend on each other after years of being enrolled in classes where teacher do not use GSL or have limited receptive skills. The president of the National Association of the Deaf in Ghana, Samuel Asare, explained that many of his peers at the SSS he attended looked to him to teach English while he and his other classmates turned to other classmates to teach them mathematics. The smaller teacher/student ratio also made it possible for teachers to tutor students individually and minimize student cheating.

Teacher-centered approaches are not uncommon throughout the world. Brint (1998) explains that it is especially common in third world countries. However, other West African countries such as Mali are now experimenting with more student-centered teaching approaches in their schools. As we can see from the math program, more student-centered teaching approaches at DemoDeaf would be effective and well received by students.

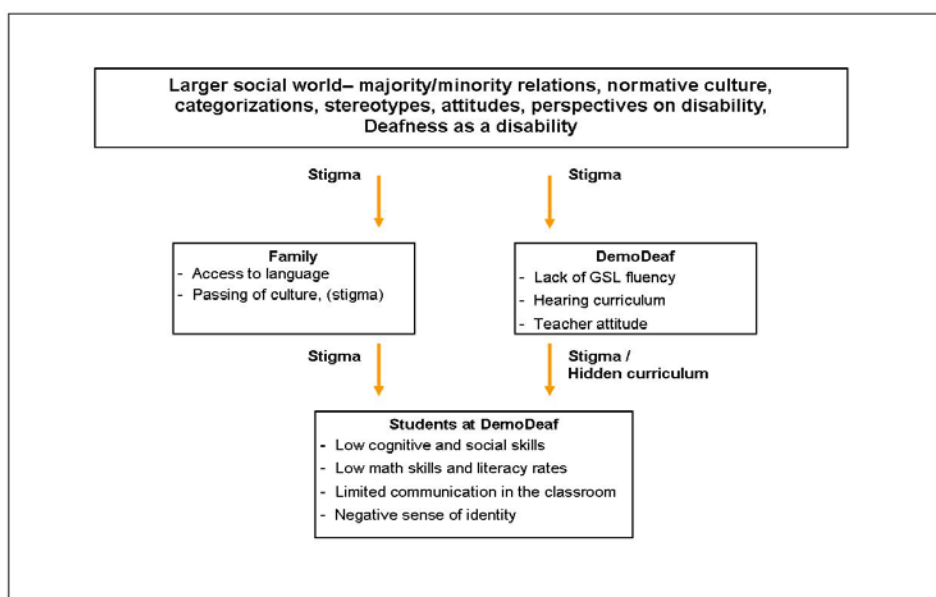
Despite the proven benefits and positive effects the program has on students, the program, however, appears to be treating a symptom—low math achievement scores—

instead of providing a cure for the causes of low math achievement scores. In order to find a solution that will stop the perpetuation of inadequate education for Deaf students, we must first understand how it is that the students are placed into the situation. It is also crucial that we understand the context in which the schools and teachers enter the school. The next chapter will address various micro and macro forces impinging on the Deaf-World through socializing institutions of the family and school.

## CHAPTER 4: AN ECOLOGICAL EXPLANATION FOR LOW STUDENT PERFORMANCE LEVELS

The larger societal forces directing interaction within groups in the larger society and the socializing institutions of the family and school lead DemoDeaf students and teachers to have low student and teacher performance levels. Within this chapter I explore that the purpose of DemoDeaf is not to provide a quality secular education for students but that the hidden curriculum at the school reinforces and produces the low status ascription of deaf students individually and as a whole.

From a so sociological perspective, the context in which DemoDeaf was formed and the educational system of which DemoDeaf is a part is important to understand before attempting to explain why DemoDeaf students and teachers have such low performance levels. To do this, I will first provide an overview of the Ghanaian Educational system. After this brief history, I will delve deeper into the multifaceted (macro and micro) forces that have contributed to the low math student achievement levels and low teacher performance levels at DemoDeaf in 2005 and 2007. I will draw from sociology of education, sociology of race and ethnicity, stratification, and Deaf Studies to explore the macro-level forces impinging on deaf people in Ghana. In addition, I will refer to experiences and examples already mentioned as well as introduce other experiences that demonstrate the micro-level forces impinging on the students at DemoDeaf.



**Figure 4.1 Socialization of DemoDeaf Students: A Map of Social Forces Influencing DemoDeaf Students before Signs of Hope International Volunteer Arrival**

### *The Formation of Ghana’s Basic Education System and Special Schools*

The education system in Ghana has made significant improvements and student enrollment has dramatically increased during the last two decades. However, implementing the Education Reform Program is difficult and leaves some schools with “poor quality teaching and learning, weak management capacity at all levels to the educational system, and inadequate access to education” (Ministry of Education 2007a).

A series of legislative acts and lobbyists have contributed to the development of Ghana’s Basic Education system and Special Schools. The Education Act of 1961 was designed to make education compulsory for all primary school aged students in Ghana—

including those with special needs. Because the government found compulsory education difficult to enforce due to the large rural population (77 percent in the 1960's decreasing to 54 percent in 2004 (World Bank Group 2007)) and political unrest, the Compulsory Universal Basic Education Program (CUBEP) was established (Babatope 1982; The Basic Education Division Ghana Education Service 1996). The World Bank credits the CUBEP with increasing national primary school enrollment by 5.2 percent between 1996 and 2001 (World Bank 2007).

The Dzobo Report of 1973 first introduced the Junior Secondary School concept to the Basic Education System (Ministry of Education 2007a). The Education Reform Program initiative of 1987/88 decreased the number of Basic Education years required from 17 years to 12. The Education Reform Program coupled with the Free Compulsory Universal Basic Education Program (FCUBEP) of 1996 further restructured Ghana's Basic Education to include two years of kindergarten, six years of Primary Education, and three years of Junior Secondary (Ministry of Education 2007a).

In 2001 there were 12,225 public Primary Schools and 6,418 Junior Secondary Schools. Total enrollment for Primary and JSS was about 767,303. The World Bank Group reports that total percent of primary aged children enrolled in primary school was at 94% in 2006, vastly different from the 79% enrollment less than a decade ago. Fifteen percent of students in 2006 were enrolled in private primary school institutions (2007).

Law 42 mandates adequate schooling facilities for all "to the greatest extent possible" making way for integrating students with additional needs or for the creation of special schools (Haynes 1991 pp. 412). Government leaders introduced Basic Education Sector Improvement Program (BESIP) to support the compulsory education program

(CUBEP) and to “improve access to basic education, especially of girls, the poor and other disadvantaged segments of the population” (Haynes 1991 pp.1; World Bank 2007). These legislative acts, and others like them, provide funding for Special Schools such as blind and deaf schools. However, as a Special School, an administrator explained in 2005, DemoDeaf receives less money from the government and families of deaf students as deaf student are considered to be family and social burdens rather than worthy financial investments.

Ghanaian students enrolled in Special Education Schools include those students who are considered to be disabled. In Ghana, the disabled include the blind, deaf, deaf and blind, mentally handicapped, and the severely “handicapped” (The Basic Education Division Ghana Education Service 1996). As of 1996 only .6% of the estimated 679,000 to 804,000 disabled in Ghana receive any form of education (The Basic Education Division Ghana Education Service 1996). These students are often grouped together in Special Schools because they are viewed as the most vulnerable to social exclusion (The Basic Education Division Ghana Education Service 1996).

Activists such as Dr. Andrew Foster, the first Deaf African-American graduate from Gallaudet University (a university for the Deaf in Washington, D.C.), minister, and founder of the Christian Mission for the Deaf (CMD), came to Ghana to lobby for the establishment of deaf schools. He and other advocates successfully lobbied for thirteen deaf schools in Ghana in 1957, including one Senior Secondary School (SSS) for the Deaf. Dr. Foster and his colleagues introduced ASL to the Deaf in West Africa, a very controversial action among members of the Deaf community (Lane et al. 1996).



American Sign Language originally taught at deaf schools has since evolved into Ghanaian Sign Language (GSL), a dialect of ASL (Eldredge 2008).

Teacher training in Ghana has undergone considerable reform within the last two decades. The Education Reform Program replaced the four-year Post-Middle School Teacher Training Program in 1991 with a three-year Post Secondary Program. There are currently thirty-eight teacher training colleges. Acceptance into a teacher training college requires applicants to have “good” grades and have a “passion” for teaching (Ministry of Education 2007b pp3). Students of the college are required to complete one-year internship before graduating (Ministry of Education 2007b). Teachers at special education schools are required to obtain more education than teachers at “regular” schools.

Interns from the University College of Special Education at Winneba, however, told me special education teachers are required to have at least a bachelor’s degree in special education (four-year degree), a year-long internship at a Special Education School, and have had at least one semester of GSL. I also learned from the interns from Winneba that the Ghanaian government randomly assigns new teachers to special schools upon graduation and that a teacher who has studied how to work with the blind has just as much chance of being sent to work at a deaf school as a teacher who has studied to work with the deaf has to be sent to a blind school.

In Ghana, the implications of random assignment and low GSL fluency among teachers are endless. Teachers’ attitudes, well being, job expectations, expectations placed on students, teaching approaches and relationships with students are strained when teachers are placed in a classroom where they do not speak the language of the students.

More importantly, student perceptions of self, identity and ability are also affected by the teachers and administrators who do not understand the students.

### *A Common Obstacle Preventing Quality Deaf Education*

A major obstacle preventing quality education for Deaf people is that natural sign languages of Deaf people are not always recognized as legitimate or are undervalued by hearing officials, educators, and community members (Lane et al. 1996; Higgins 1980; Corker 1996; Lampropoulou 1988; Ojile 1988; Okeyere & Addo 1989). Countries such as Ghana, Nigeria, Greece, and Saudi Arabia struggle to produce qualified teachers to teach in schools for Deaf students (Lampropoulou 1989; Ojile 1989; Okeyere & Addo 1989, Al-Muslat 1989). Many hearing often fail to see the need to require all teachers of Deaf students to be fluent in the language of their students and the negative consequences resulting from the lack of communication between students and teachers.

Unfortunately, not all educators and policy makers understand the implications of not providing natural and visual languages in the classroom of Deaf students. For many, the idea of valuing sign language means undervaluing auditory languages. This goes against the normative hearing culture—something they have taken-for-granted for so long (Davis 1995). The taken-for-granted values within the normative culture are perpetuated through socializing institutions such as the family and the school.

### *Society and the Normative Culture*

The social structures within the larger hearing society, or the rules and resources directing interaction between individuals and groups (Giddens 1984), shape the way people act, think, and feel (Macionis 2007). It is in this way that Emile Durkheim (1984) theorized that society is “in ourselves” but also “beyond ourselves.” The hierarchical

organization of society divides groups and individuals through power relations and social status categorizations. Those who control the wealth, power, and prestige create the standards and structure of socializing institutions.

### *Majority/Minority Relations Influences on Socializing Institutions*

The policies involving Deaf education are created by hearing majority members with hearing ideals, beliefs, and frames of reference. In this section I will explore how the medical and social models of disability prevalent in social organizations throughout society have led to the unequal quality of education Deaf students at DemoDeaf receive. The medical and social models of disability support the claim that Deaf people are disabled (Lane et al. 1996; Oliver and Sapey 1996; Turmusani 2003). The consequence of viewing Deaf people as disabled has been that the focus or aim of Deaf education is not to provide Deaf children with secular knowledge and empowerment, but to attempt to rehabilitate them into becoming more “hearing” (Lane 1992). The objective to socialize Deaf children and adults to become more hearing has been perpetuated in society through majority and minority power relations between hearing and Deaf people.

The majority, or dominant, group typically has larger membership numbers, but more importantly, have most of the power in society (Higgin 1980; Macionis 2007; Yetman and Steele 1975; Schermerhorn 1996). Dominant or majority group members have the power to ascribe statuses and identities to minority groups within the larger society (Cornell and Hartman 2007). Ascribed categorizations given by the dominant group in society are based on socially created divisions such as beliefs, sex, age, sexual orientation, religion, and hearing status. When individuals do not meet the standards of

normality in the larger social world they are labeled or ascribed identities considered as odd or strange (Davis 1995; Higgins 1980; Lane 1984, 1993).

Schermerhorn (1996) adds that the dominant group has authority over the larger value system and power to act “prime allocators of rewards in the society” (pp. 17). Stakeholders, policy makers, administrators, and educators are usually members of the majority and inadvertently perpetuate taken-for-granted values, norms, and meanings of the larger society by imposing them onto subordinate populations (Barth 1996; Brown et al. 2003; Cornell and Hartman 2007; Higgins 1980; Lane 1984, 1992; Lane et al. 1996). The majority have leverage over minority groups because they control the rewards or the power, wealth, and prestige within the larger social world (Yetman and Steele 1975).

Minority groups depend on rewards that are usually granted by majority group members directly (through employers, land owners, etc.) or through social institutions and government policies (Brown et al. 2003; Yetman and Steele 1975). Rewards include access to capital, development of human capital and social capital, employment, education, health care, etc. Distribution of rewards and resources, however, may depend on merit, nepotism, purchase, patronage, or bribery (Goldthrope 1996). The education, experience, funding, and opportunities necessary to gain access to rewards are not usually readily accessible to subordinate members of society (Ballantine 1997; Brint 1998; deMarris and LeCompte 1999; Ogbu and Simon 1998) unless they are willing to accept labels that the majority ascribe them (Boam 2008). For example, deaf children may only go to school in Ghana if they are enrolled in a Special School reserved for the disabled.

When resources or rewards are unequally distributed social inequalities arise. Schools controlled by majority group members are fitted to majority group member

students, not minority students (Brown et al. 2003; Deschenes et al. 2001; Lane et al. 1996; Ogbu and Simon 1998). Schools for the Deaf, for example, in most instances are designed and built from the ground up on hearing understandings of deafness and educational policies (Branson and Miller 2002; Lane 1984, 1992.; Lane et al 1996; Quartararo 1995) and as a way of finding something to do with the deaf population (Padden and Humphries 2005). As a result, many Deaf schools teach academic subjects to students in languages that are unnatural to Deaf children or focus on lip reading and speech training instead of spending more time on academic subjects (Erting 1994, 2001; Harris 1995; Higgins 1980; Monikowski and Winston 2003; Oliva 2004; Stinson and Kluwin 2003). As a result Deaf students receive lower national test scores than their hearing counterparts. Ethnic minority groups have similar struggles. Majority group members often attribute lower performance levels of minority groups to ability or other false assumptions and not to inequalities in the quality of education (Brown et al. 2003; Cornell and Hartmann 2007). Given the limited power of minority groups, they typically cannot dispute inequalities and wrongfully ascribed identities, stereotypes, and stigma.

Prevailing perceptions of Deaf people reflect the social distance between hearing and deaf groups. Deaf people in different parts of the world have been and still are labeled with stereotypes claiming they are lazy, incapable of learning or thinking, a burden to the family, diseased, cursed, or disabled (Lane 1984; Turmusani 2003; Weisel 1998). For example, Wisdom Mprah (2008), (a former teacher at the Senior Secondary School for the Deaf in Mampong-Akuapim, Ghana) explained that in Ghana, the hearing majority perceive deafness as a “negative condition.” He went on to explain that that “deafness is a derivative of a medical category but has a spiritual origin...is a threat to a

strong identity, needs to be cured, rejected, etc. If not, it needs to be hidden.” He continued by explaining that rarely do hearing people call deaf individuals by name, but by a derogatory term instead. Mprah explained that the negative labels are repeatedly reiterated in Ghana through institutions such as the home and school. Parents and teachers within these institutions encourage deaf people to reject a positive deaf identity. It is in this way, Mprah asserts, that the deaf in Ghana face a “dual oppression,” from the hearing world and themselves.

Barth (1996) argues that the ascribed identities given to minorities are socially constructed assignments and forever changing. Branson and Miller (2002) argue that that deafness came to be thought of as a disability only after a long process of epistemic violence changing the formation and framing of knowledge from a religious epistemology to a scientific epistemology. Some scholars assert Deaf and hearing individuals once lived side by side, and hearing individuals in society used both sign and speech before the standard practice of defining, categorizing, classifying, and labeling individuals and groups became the norm (Branson and Miller 2002; Ree 1999). Eventually the medical model of disability gained popularity and hearing doctors and specialists shifted their attention to “fixing” deaf people. Hearing experts then deemed themselves stewards over deaf people and assumed the responsibility for designing their integration into hearing society.

The medical model of disability is still used today by medical doctors, however, the social model of disability has become popular among many educators, policy makers, and government leaders as they have tried to find ways to integrate deaf people into society (Lane et al. 1996). This model advocates that those born with so-called

impairments actually represent diversity in the range of abilities among human beings, and that individuals only become disabled once society places labels and limitations on them (Oliver & Sapey 1996; Turmusani 2003). Members of society, therefore, have a social responsibility to accommodate those groups with different needs from the majority. For example, interpreters may be provided for hearing and deaf people to communicate with each other or supplemental income or stipends for education should be given to the disabled etc. (Lane et al. 1996; Oliver & Sapey 1996; Turmusani 2003).

Members of the hearing-world involved in lobbying for policies for the deaf as a disabled group or fundraising for charities who “help” deaf members of society often adhere to the social model of disability. Ladd (2003) points out that as an individual becomes increasingly involved with a charitable group and rise to management positions, wealthy individuals and policy makers look to them for advice on how to help this so called disabled population. Ladd goes on to explain that when the views of those who are experts (in the eyes of the hearing-world) are contrary to the Deaf community’s, the latter are marginalized. As a result, decision makers and resource allocators remain uninformed about the differences between the medical perception of deafness and the Deaf community (Ladd 2003).

The identity of “disabled” emerged over time, and the ways people perceive the disabled has changed over time through group ascriptions. Cornell and Hartmann (2007) build on Barth’s observations regarding changing group identities. They note that identities are “built, rebuilt and sometimes dismantled over time...” as the “forces that impinge on them change as the claims made by the group members and by others change as well” (pp. 75). In other words, minority groups can be agents of change as they assert

a new identity, contrary to the identity ascribed by the larger and more powerful community.

*Group assertion of identity.*

Deaf leaders and community members have asserted that they are not a disabled group, but a linguistic minority. As a linguistic minority, members share a culture rich with rules for social interaction, values, amusements, symbols, behavioral standards, technology, and language all focused on a visual experience (Charrow and Wilbur 1975; Joyner 2004; Lane et al. 1996; Senghas and Monaghan 2002; Swisher 1989; Woodcock et al 2007). Cultural and symbolic behaviors are voluntarily developed, practiced, and passed on to younger generations through the Deaf Community (Charrow and Wilbur 1979; Crouch 1997; Lane 1992; Senghas and Monaghan 2002).

Like other minority community memberships (Cornell and Hartman 2007), Deaf community membership requires an identification with the Deaf, shared experiences that result from being deaf, and community participation (Barth 1996; Lane et al 1996; Schermerhorn 1996). Humphrey (2001) describes the layers of the Deaf community as those of an onion. The middle, or the core, represents those with generational Deaf families who have passed on natural sign languages from one generation to the next. The layers moving out from the core represent the positions of others who feel less committed to Deaf identity. Individuals occupying the outermost levels identify themselves as hearing impaired rather than Deaf, signifying their allegiance to the hearing community (Humphrey 2001; Lane et al. 1996; Senghas 2002).

Salience of membership is determined by factors such as the number of Deaf in the family, if persons are born Deaf, if natural sign language is preferred over manual



signs, and amount of residual hearing. Deaf people often sign “hearing in the mind” to illustrate that the hard-of-hearing or hearing-impaired individual is acting hearing. This is similar to some observations of situations in which black Americans accuse other black Americans of “acting white” (Ogbu and Simmons 1998).

As a linguist minority, experiences of deaf people parallel the experience of ethnic or other minority groups. Minority groups often experience oppressive and discriminatory policies and programs (Brown et al. 2003; Persell 2008; Ogbu and Simons 1998). Mprah (2008) explained from his experience and observations, discriminatory policies based on hearing values in Ghana can be found in “...educational institutions, sign language policy, employment, e.g. teaching, health policies, etc.” Inequalities resulting from such discrimination are indicated by lower school enrollment, completion rates, employment, etc. (Cornell & Hartmann 1998; Charrow and Wilbur 1979; Crouch ; Lane 1992; Senghas and Monaghan 2002).

Members of the dominant majority group, hearing individuals, expect Deaf people to assimilate into social institutions, such as the family and school, that are saturated with hearing values. In these situations, cultural mismatches may occur and cause social or developmental issues in deaf children (Deschenes et al. 2001). For example, if parents depend on auditory communication modes not natural to the deaf child, they risk causing developmental delays. In addition, if the family’s reaction toward deafness reflects negative attitudes toward deaf people, they will most likely encourage their child to have a negative self-identity (Akamatsu 1998; Andrews et al. 2004; Higgins 1980).

The socialization of deaf students also occurs in schools. Educational systems are organizations designed by hearing educators who have debated for over a century about

how to teach the deaf (a debate that came only after the debate regarding whether the deaf could be educated in the first place) (Branson and Miller 2002; Higgins 1980, Lane 1984, 1992). The debate between the oralist philosophy and sign systems may be considered to be the most prominent debate (Lane 1992). However, neither of these philosophies includes teaching deaf students through natural sign languages.

Oralism is a philosophy that gives higher status to verbally spoken and written languages than non-verbal languages (Lane 1984) and is characterized by its insistence that signing should be proscribed as an obvious impediment to the acquisition of speech. In 1880, the Congress of Milan (which included only one Deaf delegate, James Dennison) solidified the decision among educators to base Deaf education purely on the oralist philosophy (Lane 1984). The congress also pushed Deaf teachers from the Deaf educational system by declaring the method of articulation should be used in the classroom when instructing students (Branson and Miller 2002; Lane 1984, 1996; Lane et. al 1992). Harlan Lane wrote in regards to the significance of the decisions made at the Congress of Milan:

*...the meeting at Milan was the single most critical event in driving the languages of deaf communities beneath the surface; I believe it is the single most important cause of the limited educational achievements of modern deaf men and women. (1992 pp. 113)*

The articulation methods used at these schools require students to undergo hours of monotonous and repetitive training to learn to lipread and use speech instead of studying academic subject content (Harris 1995; Joyner 2004; Oliva 2004). The most

skilled lipreaders only understand an average of 40% of what is being said (Charrow and Wilbur 1979; Senghas et al. 2002; Swischer 1989; Turmusani 2003). When speakers do not enunciate with their lips clearly, move a hand or other object over their mouth, is speaking behind them, too quickly, or even with an accent, it becomes difficult to lipread.

Students at Deaf schools which base curriculum on the oralist philosophy appear to undergo rehabilitation in the guise of education rather than an actual secular education (Eldredge 2008). Proponents of oralism such as Abbe Sicard and Alexander Graham Bell conceded the ineffectiveness of oralism to educate Deaf people. However, men such as Bell argued not that oralism was the best way to provide access to communication, but that it was the best way to restore them to society. Bell once wrote, "If we have the mental condition of the child alone in view, without reference to language, no language will reach the mind like the language of signs." However, he adds, "the main object of education of the deaf is to fit them to live in the world of hearing-speaking people" (Lane 1984 pp. 365). Today, many Deaf schools have returned to the use of artificial sign systems as used in some schools before the oralist philosophy penetrated Deaf educational system across the world.

Before Oralism was implemented some schools for the Deaf such as the National Institution for Deaf-Mutes in Paris used what Charles-Michel de L'Épée called methodical signs. Methodical signs are a kind of artificial sign system developed by hearing educators to mirror the grammar of the spoken language (Branson and Miller 2002; Lane 1984, 1996). De L'Épée developed French methodical signs after assuming sign languages are too shallow to convey philosophical ideas or scientific knowledge (Branson and Miller 2002; Lane 1984, 1996). Methodical signs were used in the

classroom at the National Institution for Deaf-Mutes in Paris, however, students often reverted back to natural sign languages before and after school or during their free time (Branson and Miller 2002; Fischer and Hulst 2003; Harris 1995; Oliva 2004).

Natural sign languages have the “same linguistic, cognitive, and epistemological status as spoken languages” (Power and Leigh 2003 pp. 45). Natural sign languages have their own sets of rules for inflection, tenses, singular-plural forms, word formation processes, and so on and are not merely a signed representation of the local dominant spoken language (Fischer and Hulst 2003). Natural sign languages are also a gateway to the larger society as a whole because it gives the deaf individual a means or a medium to learn languages and exercise cognitive abilities. Primary natural sign languages give deaf children natural access to communication, education, and relationships with family and community members (Akamatsu 1998; Erting 1995, Fischer 1998; Lane 1984; Lane et al. 1996).

Hearing individuals often confuse natural sign languages with artificial sign systems. The ongoing debate between hearing educators about oralism, artificial sign systems, and natural sign languages and the continuous transitions from one philosophy to the next has created confusion among parents and teachers alike on what mode of communication to use with deaf children. As a result, a variety of sign systems, signs heavily influenced by the local spoken language, and oral students can be found in a single classroom. Teachers assigned to these classrooms struggle as they expect students to conform to the teacher’s preferred mode of communication and their preferred mode of communication.

Teacher ability to effectively teach Deaf students is dependent on their signing abilities and knowledge of Deaf culture. Unfortunately, in many cases throughout the world teachers of the deaf are not required to be fluent in a sign language, as explained earlier is the case in Ghana. In Ghana it appears that the establishment of such minimal requirements has created a hidden curriculum conveyed to students at the University College of Special Education at Winneba. The message is conveyed that GSL is either not a critical element at deaf schools or that GSL will not be difficult to learn upon arriving at the assigned school. Also, teachers are not introduced to GSL's sophistication and depth, leaving teachers in training at Winneba to draw on preconceived notions prevalent in the larger society that the language of the deaf is very limited. DemoDeaf teacher refusal or resistance to learn GSL is a reflection of these conclusions. In addition, comments made by teachers about the inferiority of GSL to English also reflect how ill-prepared teachers are before entering DemoDeaf.

Teachers who have been socialized to believe in the stigma and negative perceptions against deaf people bring these same values into the deaf classroom. The consequences caused by the larger societal forces that lead to the production of ill-equipped teachers with poor language skills and negative perceptions will be discussed in a later section. First, I will return to the family as a socializing institution and discuss how the family poorly prepares the deaf student for schooling. It is within the family that the formation of a healthy identity, self-esteem, social and developmental cognitive development begins.

*The Socializing Institution of the Family and the Deaf Child*

In Ghana, the structure of the family varies by locality, however, the conveyances of culture and survival techniques are universal functions of the family as an institution that allow sociologists to refer to the family cross culturally (Georgas et al. 2006, Levy and Fallers 1999). For the purposes of this paper, I am concerned primarily with the socializing effects the family may have on the deaf child. In this chapter I discuss the effects the family unit may have on the deaf child as parents or caretakers act as socializing actors and pass on norms and values that stigmatize deaf people. Because the focus of my paper is not on the definition of the family but on the function of the family as a socializing institution, I am able to draw from sociology of the family literature conducted outside of Ghana in order to understand how the deaf Ghanaian child and parent/caretaker is affected by the socialization process.

*Ghanaian family structure and functions.*

Various family structures are found in Ghana. Polygamist practices can be found in traditional areas (Farber 1968; Goody 1973) while monogamist practices are found in larger cities (Farber 1968; Georgas 2006). However, there is also a large population of single mothers because of the high separation rate among Ghanaian men and women (Goody 1973; Lloyd and Brandon 1994). The fostering of children to extended family is a common practice for three reasons. First, it is an acceptable way to show respect to a member of the extended family (Goody 1973; Lloyd and Brandon 1994). Parents may not be able to provide enough for the child to survive (Lloyd and Brandon 1994), or the mother may remarry into a new family and her children are not welcomed into the new household. DemoDeaf students explained that the experience of living on family

compounds and being raised by caretakers other than their parents is common even among themselves.

No matter the family structure, the caretaker(s) of a child is responsible for teaching family values, skills, and knowledge important to living within the family and the society around them (Olowu 2006; Goody 1973). Family members teach children by modeling behavior, expressing spoken and unspoken expectations, through discipline, positive reinforcement, and so on (Calderon and Greenberg 2003). When an infant is born deaf or becomes deaf as a young child, parents' abilities to pass on these social values through verbally spoken means is hindered to the extent that they rely on oral communication (Calderon and Greenberg 2003; Erting 1985; Higgins 1980).

*Deaf children in hearing families.*

The discovery that their child is deaf often leaves parents shocked and not sure how to react or what to expect. Traditionally, parents associated their child's being deaf to punishment from God. This is still common in low socioeconomic and traditional areas (Turmusani 2003). Many of the children at DemoDeaf reflected this belief as they said God punished him or her or a parent by making them deaf. One student at DemoDeaf explained that his being deaf was caused by a curse placed on him by some kind of witch doctor because his dad was an adulterer.

Parents in low socioeconomic or impoverished areas may feel an extra burden as they believe their deaf child will not be able to earn a healthy wage and that they are destined to be a financial strain on the family (Satpati 1989; Turmusani 2003). Because parents may feel ashamed of the curse or extra burden of having a deaf child, the parents may foster the child out of the home or attempt to hide the deaf child from non-family

members (Lloyd and Gage-Brandon 1994). At DemoDeaf there were a few students who reported that their parents ostracized them after they became deaf. This is not unusual, even among students who became deaf at an older age and already had developed strong bonds with parents and had already gone to public schools.

Hearing parents typically want to find a way to “fix” their child’s ears to become hearing. Parents want to and expect to verbally communicate with their children, share similar life experiences, and enjoy similar hobbies such as listening to music or singing (Andrews et al. 2004; Calderon and Greenberg 2003; Higgins 1980; Turmusani 2003). Parents turn to chiefs, respected religious leaders in the community like medicine men, witch doctors, or priests, and medical specialists such as doctors, audiologists, and speech language pathologists for assistance (Branson and Miller 2002; Joyner 2004; Lane 1984; Turmusani 2003). More often than not, these “specialists” are unsuccessful in “fixing” their patients’ hearing (Crouch 1997). If “fixing” their child’s hearing is not an option, parents have to find new ways to facilitate communication with their deaf child.

*Communication with deaf children in hearing families.*

Hearing parents are introduced to the world of hearing aids and medical procedures such as cochlear implants, speech therapy, lip reading, sign languages, and school alternatives when available. However, information given to parents may be overwhelming and is almost always strongly biased. For example, an audiologist or speech language pathologist may be more familiar with speech therapy and lip reading techniques rather than sign languages and, therefore, give an unequal emphasis to lip reading resources (Andrews et al. 2003; Higgins 1980). In more traditional societies, specialists may also consider those who are deaf to be inferior and may discourage



parents from accepting and embracing their child's language needs (Turmusani 2003). The responsibility of parents to give their deaf child a primary language, however, is critical (Akamatsu 1998; Calderon and Greenberg 2003; Erting 1994; Lang 2003).

Primary languages are essential in order for children to become high functioning members of society (Akamatsu 1998; Collier 1987; Cumins 1979; Erting 1995; Fischer 1998; Higgins 1996; Lane 1996). Primary languages provide infants and toddlers the means for cognitive development and to learn other languages and subject matter in the future through study and memorization (Akamatsu 1998; Fischer 1998). Parents choose the primary language of their hearing children. In Ghana, many parents teach their children the local tribal language such as Twi or Akan and then send their children to school where they learn English, the National language.

However, the language needs of deaf children are different from hearing children. It is not possible for deaf children to develop language the same way hearing children do. Deaf children cannot hear a sound, see an object, and then put the two together like hearing infants. This must be done visually (Power and Leigh 2003). Deaf children cannot eavesdrop on verbally spoken conversations from another room or even in the same room. But, they can *see* conversations.

Parents are often under the impression that if they teach their child to lip read and use speech, their deaf child will have greater access to the rest of the hearing world (Harris 1995; Lane 1984). However, Deaf children are put in danger of not fully developing their cognitive skills when they are not given a primary language in their early years because it may hinder language acquisition at such a critical time (Akamatsu 1998; Erting 1995; Morel 1994; Higgins 1996). The situation for the cognitively born

deaf Deaf student is more complicated as they may learn basic words and phrases to communicate with family members in Twi and/or home signs, then move to a school where they learn GSL from other students, but are taught by teachers primarily in broken English, heavily influenced English signs, or outlines and lessons written on the chalkboard.

The debate over signed systems versus natural sign languages has caused great confusion (Lang 2003) and has made it difficult for parents to know what sign system or language to learn themselves and teach their child (Fischer 1998). As mentioned before many hearing persons are unaware of the difference between sign systems and native or natural sign languages (Fischer 1998). The financial situation, resources, and the time it takes to learn a signed system or language make learning any kind of sign language difficult (Erting 1985; Fischer 1998; Turmusani 2003). Some families develop a series of home signs for basic communication (Andrews 2004). However, home signs are not enough to supplement the incidental information from daily conversations deaf people do not have access to.

The amount of incidental information (or informal learning) that deaf children have access to is extremely different from the amount of information hearing children have access to (Calderon and Greenberg 2003; Gregory 1998). For example, hearing children can learn from strangers as they walk down the street and overhear another conversation, and they can listen to the radio in the car or while they are doing chores. Because deaf individuals rely so much on vision, they are limited to seeing what is going on around them. Families may work to supplement the incidental learning by signing whenever the Deaf member of the family is in the room and through other deaf clubs

(Calderon and Greenberg 2003; Gregory 1998). However, families do not often take these steps to meet the needs of their Deaf family members. The level of dedication and investment that the family places on learning sign language and accepting the child's deafness is largely determined by the worth that the larger society places on sign language and acceptance of deaf people.

*Asserted and ascribed deaf identities.*

Deaf Community leaders and members are actively combating condescending stereotypes, attitudes, and discriminatory practices in many parts of the world. However, as is the case with ethnic and other minorities who have grown up with ascribed labels and identities, it is easy for them to believe in these negative portrayals themselves. For example, in 2005 and 2007 when I told Ghanaian deaf students that my father was deaf or that he was born deaf, they immediately replied "Oh, so sorry." The sincerity and concern in their eyes and facial expressions was so clear that it sent chills up my spine every time. Mprah (2008) explained that Deaf Pride is a foreign concept to the deaf in Ghana. For the deaf in Ghana this term is outrageous and unrealistic. He explained that it is ingrained in all deaf persons in Ghana that they are bad and that they bring shame to the family.

As the larger society passes on its negative interpretations of what it means to be Deaf to deaf children, the children are left feeling as though they are bad, unable to learn, menaces to society, without personal worth, and so on (Harris, 1995; Lane 1984, Turmusani 2003). This negative self-identity is hardly true, healthy, or conducive to learning. As hearing people continue to involve themselves in deciding for the deaf what the primary language of the deaf should be and how they should be educated, the students

must grapple with their need for a consistent and natural or native language. It is in this state, where deaf children possess a negative self identity with very limited language skills, that they are sent to another socializing institution such as DemoDeaf only to have these negative ascriptions reinforced.

### *Socializing Effect of Deaf schools on Students*

Deaf Educational systems often focus less on ensuring quality education and more on socializing Deaf students into becoming more like “hearing” individuals (Akamatsu 1998; Branson and Miller 2002; Fischer 1998). Similar to Milton Gordon’s observation that an Anglo-Conformity ideology is forced onto people not of European descent as described in *Assimilation in American Life* (1964), the ideology of “Hearing-Conformity” is forced onto Deaf people throughout many parts of the world. In this section I will explore how hearing educators and administrators attempt to assimilate deaf students into the hearing-world through language, integration programs, and hidden curriculum. The result of educational systems based on these assimilation models can be seen at schools like DemoDeaf. The low performance levels at DemoDeaf appear to be a result of using programs and teaching methods that originally were designed for a hearing student body, not a Deaf student body.

### *Language as a means of assimilation.*

Yetman and Steele (1975) describe the assimilation model as involving “...efforts to integrate or incorporate a group into the mainstream of a society. The objective of assimilation is a homogeneous society” (pg. 229). Hearing educators, policy makers, and parents use language as a means to assimilate Deaf people into society. The debate over the oralist philosophy, signed systems, and artificial signed systems has been ongoing

over the last three centuries. In 1880, at the Congress of Milan, educators declared deaf education would be conducted under the oralist philosophy. Educators assumed that Deaf people need to be able to lipread and use speech in order to convey thoughts, ideas, and to become true participants in society. However, as educators and family members of Deaf people soon came to realize, and lipreading and speech approaches is not efficient at facilitating communication or information (Harris 1995; Higgens 1980; Joyner 2004; Lane 1984; 1994; Lane et al. 1996).

Instead of the oralist philosophy, many parents and educators turn to artificial sign systems that mirror the dominant spoken language to help students learn to read and write English and to facilitate communication (Erting 1984, Gannon 1981). Sign systems include some natural signs, invented manual forms of the local language, and the inclusion of fingerspelled words such as *of* and *is* (these words are omitted in natural sign languages). For example, to sign *butterfly* one will sign BUTTER and FLY (like an airplane). Many families throughout the world do use artificial sign systems such as Seeing Essential English I and II. However, these artificial systems have not proven to be as effective as teaching Deaf students to read or write English as anticipated.

In the 1960s and 70s the new trend was to turn to Total Communication after conceding the failure of oralism and the less-effectiveness of artificial sign systems alone (Ladd 2005; Smith and Campbell 1997). TC, as originally introduced by Roy Holcomb, asserted that students should be educated in any and all forms of communication appropriate for the deaf individual (Ladd 2005). Forms of communication can include lipreading, fingerspelling, and auditory amplification with a sign system, etc. (Geers and Mood 1992; Smith and Campbell 1997). Many educators look to TC as the “golden

mean” to reconcile the best elements of oralism and natural sign language approaches (Smith and Campbell 1997). However, TC programs also have not met the expectations educators and policy makers anticipated (Ladd 2005; Smith and Campbell 1997).

Total Communication has been a less than effective tool in educating deaf students. First, the majority of people who espouse TC incorrectly consider it to mean simultaneous communication or Sim-Com (Gannon 1981). Sim-Com occurs when hearing educators or parents use speech and signs simultaneously to communicate with deaf people. Second, few teachers have command of Sim-Com. Lynas et al. (1989) reported in one case study by Marmor and Petitto that only 5% of what a teacher signed matched what he or she said. This is comparable to the example given earlier in the study of the DemoDeaf teacher who thought she was signing “eating” but was really signing “eat.” Third, Lynas (1989) found that it is impossible to practice Sim-Com because the brain cannot manage verbal and manual signs at the same time (as quoted in Smith and Campbell 1997). As educators and administrators have switched to different trends on how to communicate best with Deaf people, Deaf students have usually stayed loyal to natural sign languages whenever their teachers were not looking.

Researchers have found Deaf students often resist the various forms of language educators often force on students. On their own personal time, Deaf people often resort back to their primary and natural sign languages (Branson and Miller 2002; Corker 1996; Harris 1995; Power and Leigh 2003). Robert P. McGregor, the first president of the

National Association of the Deaf, stated:

*The utmost extreme to which tyranny can go when its mailed hand descends upon a conquered people is the proscription of their national language, and with the utmost rigor several generations are required to eradicate it. But all the attempts to suppress signs, wherever tried have most singly failed. After a hundred years of proscription in Germany and Austria, they still flourish, and will continue to flourish to the end of time.*

*What heinous crime have the deaf been guilty of that their language should be proscribed?"* (as quoted in Lane 1984 pp xvii).

When Deaf schools staff classes with teachers who are not fluent in the language of their students the students are not given access to education. Instead, they must rely on their ability to decipher what they think the teacher wants, develop coping mechanisms in the classroom, and to do their best to put the points of a lecture together without all the pieces. Assimilating Deaf students through language can be done at Deaf schools and hearing schools alike.

*Assimilation of deaf students through integration programs.*

In addition to using language as a means of assimilation, educators attempt to assimilate deaf students into the larger hearing-world by placing them into hearing classrooms and/or schools, inclusion programs (where classrooms are more or less half hearing and half deaf), separating deaf students from hearing students at the same school,

or through resource rooms where deaf students receive extra tutoring or remedial instruction. Problems in integration programs range from requiring students to rely on speech or lipreading in the classroom, under-qualified interpreters or transliterators, obstacles preventing true class membership and participation<sup>10</sup>

Programs that follow the oralist philosophy, TC, and integration approaches have been beneficial for some, but for many more, these programs have brought frustration and heartache (Corker 1996; Harris 1995; Higgins 1980; Lane 1992). Never can a deaf person be completely relaxed or sure that he or she knows what is going on because they cannot see or hear other students and teachers talking around them (Higgins 1980; Harris 1995; Oliva 2004). Many deaf individuals who have attended these integration programs report feelings of social exclusion, isolation, negative self esteem, and the formation of poor deaf identity. Because of the many consequences of integration programs, many Deaf individuals do advocate for residential schools staffed with Deaf teachers for Deaf students.

#### *Assimilation and the Hidden curriculum.*

Schools in which sign language is used in and out of the classroom are an alternative to mainstreaming and integration programs. These alternatives are strongly supported and recommended by the Deaf community. Schools for the Deaf are beneficial for students because they have the potential to empower children through the opportunities they provide for students to associate, together, learn sign language, communicate, build relationships, and often receive education in the form of a manual

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<sup>10</sup> Please see the section entitled Assimilation through Integration Programs for more information.



language (Harris 1995; Bienvenu 1988; Corker 1996; Lane 1984, 1992; Lane et al 1996). Residential schools provide a critical mass of Deaf students, a place for the Deaf to know everyone is like them, have shared experiences, and “feel at home.” Students have an opportunity to develop a sense of Deaf Pride. The Deaf community so values these schools that even across generation Deaf families continue to choose to send their Deaf children to residential schools (Bienvenu 1985-1988; Lane 1984, 1992; Harris 1995).

Residential schools, however, are not removed from the assimilation and socialization processes. Students develop cognitive, social, and life skills, as well as work ethics in schools that ideally prepare students through formal and informal curricula to become contributing members of society (Ballantine 1997, Brint 1998; Hallinan 2005). As part of the socializing process students learn the normative culture as established by the majority group. The normative culture influences student academic achievement, social behavior, and moral behavior (Hallinan 2005). However, research suggests the influence of the normative culture may have a negative impact when there is a cultural mismatch between minority and majority cultures (Deschenes et al. 2001).

Normative culture is partly taught through formal curricula, but it is also conveyed through what some sociologists call the “hidden curriculum.” Benson Snyder explains that the hidden curriculum teaches students an “approach to living, and an attitude in learning” (as quoted in Ballantine 1997 pp. 196). In order for students to survive school, students must discover and respond to the implicit demands placed on them by the hidden curriculum (Ballantine 1997). Depending on school policy and the attitude toward the deaf in the local hearing community, the hidden curriculum may act

as a socializing agent or tool to reinforce social status among students as teachers ascribe negative deaf identities and low expectations onto their deaf students.

The Deaf community faces similar disparities in education and socio-economic status as other minorities whose language and culture are not recognized or appreciated by the dominant group (Charrow and Wilbur 1979). As a minority group, Deaf people have been oppressed by well-intentioned policies and programs. As a result, they have experienced effects similar to those experienced by other minority groups such as lower school enrollment, completion, employment and so forth (Cornell & Hartmann 1998; Charrow 1979; Crouch 1997; Lane 1992; Senghas and Monaghan 2002).

A large part of the confusion surrounding the debate on Deaf Education is the result of attempting to assimilate Deaf students into becoming more like hearing students. The natural consequences of these assimilation models and the confusion that has emerged as a result are seen in the Demonstration School for the Deaf.

*Micro-Level Analysis: Case Study of Schooling at DemoDeaf*

Deaf education policies are designed in a way to assimilate deaf people into becoming more like hearing people by controlling the language of deaf people, the types of educational systems deaf students attend, and through the hidden curriculum taught at schools. DemoDeaf is an example of a Deaf school whose hearing teachers are so embedded into the normative culture that they contribute to the hidden curriculum by bringing with them the stigma, negative stereotypes, and negative attitudes and perceptions toward deaf students into the classroom. As a result, there is limited communication in the classroom between teachers and students, teachers are using inappropriate teacher-centered teaching approaches, and there is a high rate of teacher

burnout at the school. The unpardonable consequence, however, are the negative effects on students' self-identity and scholastic abilities.

*DemoDeaf teacher attitudes.*

Teacher attitudes appear to influence teacher fluency in GSL, teacher expectations, teaching methods, teacher attendance, student teacher relationships, and the hidden curriculum they convey to students. Some teachers viewed DemoDeaf students as cognitively inferior, lazy, or incapable as reflected in this statement introduced in an earlier chapter, "The deaf actually make better vocational workers but the hearing students make better educated people." Another teacher however, stated that he felt the students are behind academically not because of their limited capabilities, but because they are victims of an educational system in which teachers are not held accountable for properly teaching students. This teacher showed signs of frustration when he spoke about other teachers who did not find ways to reach out to students or even bother showing up for class. The Ministry of Education expressed similar concerns in a meeting in May of 2008. In this meeting officials expressed the concern that teacher attitudes at Deaf schools need to change (Eldredge 2008b). Teacher attitudes appear to set the standard for quality of teaching at the school, influence teacher fluency in GSL, teacher expectations, teaching methods, teacher attendance, student teacher relationships, and the hidden curriculum they convey to students

*Limited communication in the DemoDeaf classroom.*

One of the biggest obstacles to quality education at DemoDeaf is that there is very limited communication in the classroom. Teachers cannot convey knowledge to students when they cannot speak in complete sentences in the language of the students. Instead,

students must attempt to guess what the teacher is talking about. A student may recognize that the teacher is talking about, for example, a flask of liquid in science class. But the student may be left wondering what about that liquid is important. Students are not given the opportunity to learn what the teacher is supposedly “teaching” the class. Unfortunately, there are a few teachers at DemoDeaf who refuse to learn GSL or even recognize it as a language.

The excuses some teachers gave for not learning GSL reflect bitter or condescending attitudes toward the educational system or GSL. Some excuses include that they did not ask to be sent to the DemoDeaf, the government does not give enough “monetary incentive” for teachers to invest the time and effort to learn GSL, the inferiority of GSL to spoken languages makes learning GSL less purposeful, and GSL is needlessly complicated and time consuming to learn. One teacher refused to learn the sign names of his students because they already had Twi and English names therefore they had “no need” for a name sign.

A few teachers struggled with the legitimacy of GSL. The idea that GSL is a rich and sophisticated spatial language was entirely new to most teachers at DemoDeaf in 2005 and 2007. Even the one hearing teacher out of a total of ten hearing teachers over 2005 and 2007 who appears to have a good command over GSL as learned from students, did not realize the place facial expressions, body movements, and use of space have in GSL.

The more teachers learned about the complexity of GSL or the students through conversations with Signs of Hope volunteers, however, the more open teachers appeared to be to learning GSL. One day an intern from Winneba complained that GSL was

faulty because there is more than one sign for an object. A senior teacher reminded her that both Twi and English have synonyms so why not GSL. At first the intern was resistant to that idea, but she said “I will accept it even though I do not understand it.” Later conversations with her revealed that she had begun to recognize that GSL was more complex than she had thought.

Because most hearing teachers at DemoDeaf JSS do not have a command of GSL, it is difficult for them to find ways of explaining concepts and lessons in ways students will understand them. It is also difficult for teachers to understand student responses and questions such as the example in chapter one of the teacher who did not recognize it when his student told him he did not understand the lecture and that the teacher became the joke of the class. Despite the obvious communication gap between the teachers and students, most teachers nonetheless appear to prefer teacher-centered teaching approaches in the classroom where the primary teaching strategy is lecturing.

*Teacher-centered teaching approach and the DemoDeaf classroom.*

In Ghana and other third-world countries the traditional teaching approach in the classroom is teacher-centered. Teacher-centered approaches include strategies that typically place the teacher in the position of authority and primary source of knowledge (Brint 1998). In this approach, the teacher’s role is to provide instruction, set expectations for learning and behavior, and the students’ roles are to meet these expectations.

At DemoDeaf the most common teaching method is to lecture students and write the lecture on the chalkboard. Lectures at DemoDeaf, however, are particularly less effective when delivered by teachers in a different language or a mixture of English, sign

systems, and GSL. The teachers do, however, also write the lectures and on the chalkboard in long paragraph form from one side of the double length chalkboard to the other side or in charts drawn on the chalk board with paragraphs in each box. However, given the low literacy levels among the students, it is not likely students actually comprehend the information that is written on the chalkboard. Most teachers appear to choose to ignore the problem of comprehension in the classroom and explain that they have written the lecture on the board and that should be sufficient for the students. Instead of accepting the negative consequences of not having language in the classroom and finding solutions to the problem such as learning GSL and turning to a more student-centered approaches fitting for their students, teachers tend to blame poor student performance on student attributes.

There are a few situations in which teachers did attempt to incorporate a more student-centered teaching approach. However, because teachers either do not recognize the low literacy levels, or comprehension, and their own limited GSL skills, these attempts were usually met with failure. For example, one teacher created a make-shift shop in the front of the classroom. He used gestures and role playing to explain *profit*. He had a student come up to buy a stapler from his make-shift shop after giving him some cedis (Ghanaian money). After subtracting the cost of the pencil he gave the student change back. Before giving change back to the student he asked the class how much he should return. Most of the class answered incorrectly. His lesson ended with him trying to help the students answer the basic subtraction. He never finished teaching what profit is, that it is the cash left over after subtracting initial expenditures.

In another instance, a teacher had students look up words in the dictionary to write sentences. He explained after the fact that he thought it would help familiarize the students with dictionaries. After the exercise students appeared to be more confused because they did not understand what the phonetic pronunciation guide, or why the parts of speech were included (or even what that meant), and why there were more than one definition listed. I found this was not a productive teaching method for the students.

Drawings or props when used properly did help students visualize important concepts or ideas. One of the most effective examples was when a teacher drew very detailed diagrams of the various layers of soil on the chalkboard. Then she led the students to a construction site on campus where there was a large pit in the ground where contractors were digging for a well. The teacher pointed to the different layers in the soil and tried to explain the different layers of soil to the best of her limited GSL abilities. Students nodded to each other with understanding. However, when one teacher drew a test tube with hydrogen peroxide in it, the students did not seem to understand what the liquid in the drawing (hydrogen peroxide) was. When demonstrations represent everyday objects or concepts that are not abstract, drawings are generally helpful for DemoDeaf students.

From these examples we can see that using a variety of teaching approaches does not necessarily mean the teaching approach is student-centered. In order for a strategy to be considered student-centered the teacher must match the teaching strategy with the needs of the students and their cognitive skill level. We can also see how the low communication levels between the teachers and students have led to limited teaching strategies and contributed to students' low cognitive skills.

My ethnographic experience leads me to conclude that the students have been moving through the system without learning the basics along the way because of the communication barrier between students and teachers. Teachers are in the classroom but are not necessarily teaching. The lost time and limited information flow in the classroom appears to be stifling student cognitive development. However, instead of improving teacher ability to convey information, teachers are lowering standards or expectations of students.

The type of knowledge most students at DemoDeaf appear to be gaining is different from the knowledge hearing students gain from public schools. To prepare for tests given by teachers who do not use GSL in the classroom studying is an intensive process of memorizing words, sentences and lists that are copied in their notebooks that have no meanings to the students. During tests students simply transfer memorized material onto answer sheets and hope they have entered the words in response to the right questions, and teachers do not necessarily appear to expect more than this from their students.

*DemoDeaf teachers and low expectations.*

Overall, teacher expectations for students are low. One teacher commented that 60-70% of his students regularly pass class exercises and tests. When asked what the cut-off score was he said, "Between twenty- and thirty-percent is a passing score." He also explained that he gives three tests in a school year. The first and second tests are comprised of ten questions while the third test is comprised of twenty problems. This same teacher explained that the grading criteria would be very different if he was teaching at a hearing school.



There are a couple of students whom teachers expect to pass their assignments or tests. One teacher explained most of his “bright” students were in a different class (though I thought there were definitely other students in this particular class we were in that were just as bright as those he named). In another instance a teacher was upset with a student because he apparently “did not even try” to do his test well. The teacher was frustrated because he knew the student could do better and the teacher told him that. However, it is still unclear how much more teachers expect from these students than from other students given that passing is between twenty and thirty percent in some classes. The limited communication in the classroom, ineffective-teaching approaches, and low expectations for students do not lead to a very rewarding teaching atmosphere. In fact, I believe the negative teacher attitudes are strengthened by these circumstances and by teacher burnout.

*DemoDeaf teacher burnout.*

The situation at DemoDeaf is not only stressful for students but also for teachers. The teachers did not go into the school knowing how important GSL is to Deaf students nor did they have any idea as to the complexity and sophistication of the language and Deaf culture at the school. The fact that they also come from a normative culture where the Deaf are looked at as second class citizen makes it difficult for them to respect the students and their circumstances and instead their preconceived notions are reinforced when they see that most students struggle in class. Teachers do recognize the fact that students have low test scores, and yet the teachers feel limited on what they can do to better teach the students or help themselves in their own situation. These stresses may lead to teacher burnout and lead teachers to refuse to learn GSL, deny that there are

problems, distance themselves from the students as coping mechanisms to deal with their predicament.

Teachers experiencing burnout feel they have little power to change their situation (Brint 1998). In 2005 and 2007 teachers commented on this perceived powerlessness. One teacher said it is not even an option for teachers to review the fundamentals with students who need them in order to do better on their tests because they are obligated to teach the government mandated curriculum. Another teacher expressed his frustration when he said that he could not suggest changes such as requiring higher GSL standards from teachers and teacher attendance because he lacked seniority. He feared bringing these issues up because of potential repercussions. In 2007, another teacher explained that he felt he was stuck in a situation he did not want to be in at DemoDeaf. He admitted that he refused to learn GSL and doubted that would ever change. However, I did learn from our conversation that he apparently tried to learn GSL at one point but became discouraged. It appears that instead of persevering and exploring ways to better the situation, he turned himself off to learning GSL and to the Deaf students as a coping mechanism.

Teachers repeatedly informed me that they do not have high expectations for students. However, they would often deny the fact that the students did not necessarily understand the lectures in class. Teachers may deny that problems exist at the school in order to cope with the stresses and burnout. For instance, in the example of the boy who stood up, shrugged to the class because he did not know what the lecture on the board meant, and then proceeded to fingerspell the lesson out, it is not was difficult to see the

students did not understand. However, the teacher either really did not understand or more likely did, but did not know how to help them understand.

Another coping mechanism that teachers employ is to distance themselves from the students, as in the case of the teacher who would not even learn students' names. Not actively monitoring student progress is another. For example, one teacher was upset that she found that one student had been turning in the work of a peer who was absent. What is more surprising is that it had gone on for two weeks undetected. This was a trend that occurred in both 2005 and 2007.

Ideally, schools should be neutral environments where all students receive quality education. However, teachers and administrators bring with them the normative culture to the classroom. The normative culture is then passed onto students through socializing process such as the hidden curriculum (deMarrais and Lecompte 1995). When the normative culture portrays the deaf in a negative light it will be reflected in the attitudes and teaching approaches teachers use in the classroom, and students are taught their roles in society as their ascribed identities are unraveled through the hidden curriculum. This appears to be the case at DemoDeaf.

The experience of students at DemoDeaf is very similar to the experience that other minority students face in schools where there are either no or very limited mechanisms set in place to counteract negative hidden curriculum and normative cultural values aimed against the minority group. Before DemoDeaf students enter into the school there are already preconceived notions and low expectations of students by faculty and possibly even family members. Students may even believe in the negative identity and low expectations as a result of their family situation before they even enter the

school. The two paralleling institutions, the family and the school, appear to be working against student potential to succeed.

Deaf people within Ghana hold a low status in the social hierarchical organization of society that leaves them vulnerable to group ascriptions, limited resources and rewards, and decision making power. Their ascribed identities are reinforced in socializing institutions of the family and school in which the normative culture with stigma and negative stereotypes against deaf people are embedded. As a result of these oppressive macro and micro forces Deaf students are not granted access to quality information, but to an educational system that merely provides society a place for and something to do with their Deaf population. However, as Deaf individuals unite to assert their position as a linguistic minority and embrace Deaf Pride, Deaf people are beginning to reassess their roles in society and create new visions of the ways they can participate and contribute to society.

## CHAPTER 5: CONCLUSIONS

The main focus of this study is to evaluate a mathematics program offered as an alternative program to the Signs of Hope International teaching assistantship program and to provide an ecological explanation for the low mathematic skill levels demonstrated by students at DemoDeaf. In this concluding chapter I will first review my evaluation of the mathematics program and what the implications of these findings are for Signs of Hope International. Next, I will provide an ecological explanation for why students have such low school performance levels. Lastly, I will include policy suggestions at the school, local, and national levels to make quality education available for deaf students.

### *The Mathematics Program*

To evaluate the math program in 2007 quantitative methods were used in the form of pre- and post-testing, sample t-tests, and ANOVA to determine if the increases in student skill level as measured before and after the program are significant. The 2007 math program has been shown quantitatively to significantly increase student math ability and qualitatively to have positive effects on student confidence levels, participation in day-time math class, and teacher perceptions of students. A paired-samples t-test revealed a significant difference in the cumulative pre-program test scores ( $M = 2.91$ ) and the post-program test scores with a  $p$ -value  $<.01$ . The number of students proficient in counting increased from thirty-four to forty-four out of forty-seven students. A sample t-test revealed a significant increase as the mean increased from .72 to .91 with a  $p$ -value of  $<.01$ . The number of students proficient in adding single-digit numbers increased from thirty-four students to thirty-nine, and the mean changed from .72 to .83 with a  $p$ -value  $<.05$ . The number of students proficient in double digit addition increased from twenty

to thirty-one and the mean increased from .43 to .66 with a *p-value* <.01. And the number of students proficient in triple digit addition doubled from fourteen students to twenty-eight increasing the mean from .3 to .61 with a *p-value* of <.01. Students also showed improvement in subtraction.

At the beginning of the 2007 program only twenty-five of the forty-seven students were able to subtract single-digit numbers from other single-digit numbers. By the end of the program, this number increased to thirty-one and the mean increased from .53 to .66 with a *p-value* of <.01. The number of students proficient in double-digit subtraction increased from nine to seventeen and a change in mean from .2 to .35 with a *p-value* <.05. The number of proficient in subtracting triple-digit increased from four to nine, however, this increase was not proven to be statistically significant. No differences in math ability were found between males and females or between age groups.

The mathematic program appears to have positively influenced student-confidence levels in math ability, student participation in their day-time math class, and teacher perceptions of students. Indications that student confidence levels increased are that more students attempted to do math exercises themselves, the amount of negative self-talk decreased when students were initially given math exercises to complete, and students appeared to reflect more belief in their own ability in such statements as I CAN that interns had them repeat several times a day.

Teachers reported seeing an increase in participation in the day-time math class as more students tried to solve math exercises in class. Given that students were so far behind in math skill levels as demonstrated by math achievement tests, it is very unlikely that improvement made from participating in the math program would necessarily be

reflected in test scores taken in their day-time math class. The results from a regular class math test posted in one of the classrooms showed that only two students out of sixteen passed the test. They passed the test with “fair” and “weak” scores while the other students “failed.”

The math program itself did not seem to dramatically improve teacher perceptions of the students. However, the conversations between teachers and volunteers do seem to help improve teacher perceptions. These conversations are possible largely because the math program frees time for interns as they already know what they will be teaching students in class that day. Intern conversations before and after the program did appear to positively influence how teachers understand and perceive students as they learn more about the sophistication of GSL and student life experiences. In addition, teachers at DemoDeaf appear to have begun to see for themselves that the students are more capable of learning than they may have originally concluded before the volunteers arrived.

In 2005 and 2007 action research methods used to collect data include participant observations of volunteers and students in their classes, student/teacher interaction, volunteer/student interaction, and volunteer/teacher interaction in the classroom. Informal interview with students, teachers, school administrators, and other interns were also recorded.

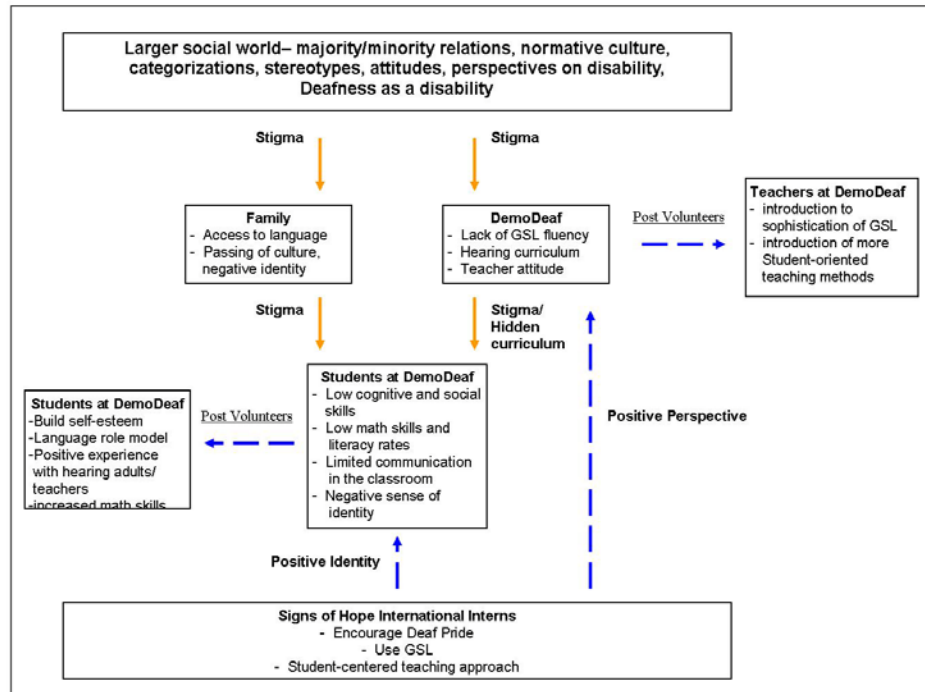


Figure 5.1 Socialization of DemoDeaf Students: A Comparison Social Forces Influencing DemoDeaf Students After Signs of Hope International Volunteer Arrival

*Implications for Signs of Hope International*

Signs of Hope International has recognized their social responsibility to conduct social impact assessments on the programs NGOs or NGO volunteers implement. After using qualitative and quantitative action research methods in 2005 and 2007 and analyses, I have come to the conclusion that Signs of Hope International teacher assistantship program at DemoDeaf does not fit the needs of the students, teachers, or Signs of Hope interns at the school due to a series of unexpected challenges in the



classroom. However, I have offered a mathematics program that has been shown quantitatively and qualitatively to have positive effects on DemoDeaf students.

The 2007 math program was designed after I conducted a needs assessment of students, teachers, and Signs of Hope interns in 2005 by applying action research methods. The assessment revealed students need teachers fluent in GSL in the classroom and assistance in learning basic arithmetic and literacy. Teachers at DemoDeaf need to understand that deaf people are capable of learning, that the teachers are not conveying complete sentences or thoughts in the classroom, GSL, the sophistication of GSL, and the importance of Deaf culture. The needs assessment also revealed that interns need more of a set schedule and curriculum to teach students at DemoDeaf in addition to more training on how to effectively work with teachers who often express oppressive attitudes toward students.

Signs of Hope volunteers at DemoDeaf encountered a series of unexpected and/or underestimated challenges at DemoDeaf. Signs of Hope volunteers/interns were often expected to take on the role of teacher in the classroom. The expectation for volunteers to master Ghanaian curriculum (which is very different from U.S. curriculum, e.g. Ghanaian Social Studies) enough to teach it to students in such a short amount of time was unrealistic. Just as the expectation for volunteers to adjust to GSL signs (e.g. signs for fufu, banku, market, etc.) enough to teach full lectures it was also unrealistic considering the time restrictions and culture shock volunteers experience.

Also, the negative teacher attitudes toward deaf people, low student expectations, and limited GSL understanding among DemoDeaf teachers made knowing how to work with DemoDeaf teachers as teaching assistants difficult. Because Signs of Hope

volunteers had more positive attitudes toward deaf people and abilities, volunteers became middle men between teachers and students. Low teacher skills in GSL left volunteers in an awkward position when they saw the lower effectiveness of DemoDeaf teachers in the classroom. This is a complicated issue because students may lose respect for the DemoDeaf teacher who does not sign or have a positive relationship with students when introduced to volunteers who sign and also see students more as individuals.

The danger of volunteer burnout was also very real at DemoDeaf. After considering the challenges of learning Ghana curriculum, encountering perspectives about deaf people that are in stark contrast to volunteer perspectives, the low GSL skills among teachers and the awkward position that placed interns in, it is easy to see how intern burnout could easily develop. When I developed the mathematics program I did so around the needs of the students and challenges in the classroom as experienced as a participant observer/action researcher.

The 2007 Math program was effective in providing Signs of Hope International volunteers something to teach to students. When volunteers went to school, the volunteers, teachers, and students knew what to expect. Because students and volunteers knew what to expect from each other, the transition to teaching basic math seemed to be easy to make. However, although the volunteers knew what they were expected to teach, they did not know exactly how they would teach it. This caused some frustration among JSS volunteers. Other concerns volunteers had were that they wanted more time to observe teachers in the classroom during the day and more positive feedback on their teaching techniques.

The math program may be further improved if Signs of Hope International leaders formally adopted the program and provided training for the volunteers before the mission departure date. In addition, volunteers should be given ideas on how to teach counting, addition, or subtraction but should also be reminded that they should find teaching techniques to use that they are comfortable with. This will continue to stimulate creativity among the volunteers.

### *Contributors to Low Student Math Achievement Levels*

The simple explanation for why students demonstrate such low math performance levels at DemoDeaf, in general, is that teachers who are not fluent in GSL, the language of DemoDeaf students, are being assigned to the DemoDeaf classrooms and teach in a foreign language. To understand why inadequately prepared teachers are being assigned to the DemoDeaf classroom, however, is a complicated question and one that merits an ecological explanation.

In this paper I demonstrate that the purpose of deaf education at DemoDeaf is not to provide a quality education for students but to teach students to become more like hearing people and to provide a place for members of the larger hearing society an institution to which they can send deaf persons. This hidden curriculum is influenced by larger societal forces directing interaction within groups in the larger and dominant hearing society and the institutions of the family and school.

The normative culture within the larger society as influenced through majority/minority relations and power dynamics which establish what is considered to be acceptable, normal in society, and what should be stigmatized against (Goffman 1963; Higgins 1980). Unfortunately, Deaf people in Ghana and many other parts of the world

have been grouped and labeled as “handicapped,” “disabled,” or as persons who need to be “fixed” or assimilated into hearing society (Branson and Miller 2002; Higgins 1980; Lane 1984, 1992; Lane et al. 1996, Ree 1999). As a minority group with limited access to wealth, power, and prestige, deaf people are subjected to educational systems that are developed and designed for the majority group members (Brown et al. 2003; Yetman and Steele 1975). The result is often a mismatch between the school and the students (Deschenes et al. 2001).

An example of this mismatch and attempt to assimilate Deaf students at DemoDeaf is that teachers implement the same kind of teacher-centered teaching approaches at DemoDeaf as they would at hearing schools. Teachers rely on lectures as the primary method to teach students. The lectures are delivered through a combination of broken English (mouthed or spoken), artificial sign systems, GSL signs, and written on the chalkboard in paragraph or outline form. However, in 2005 and 2007 only two teachers out of eleven were fluent in GSL (one of which is Deaf) and the majority of students appear to have very low literacy levels.

To understand the irony better, imagine sending a French-speaking teacher into a classroom of Twi-speaking students. No Twi-speaking student would ever be expected to understand a lecture given in French. Neither would a French speaking teacher ever be sent to teach in a Twi-speaking classroom. The idea is ridiculous to most. However, that this is what DemoDeaf students and teachers experience daily.

A second example of a mismatched educational system and attempt to assimilate deaf students is through the national mandated curriculum. Teachers who do not speak the same language as their students are expected to teach the same material in nearly the

same amount of time. DemoDeaf students are then subjected to the same national standardized tests as their hearing peers.<sup>11</sup> The educational system, as a result, has set deaf students up for failure.

The normative culture and the value placed on normality influences how hearing family members react to and treat deaf family members and the language deaf children have access to. Traditionally, the birth of a deaf child was seen as a punishment from God and the child was thought of as a burden or shame for the family (Turmusani 2003). Mprah (2008) explains that parents of Deaf children in Ghana believe their deaf child brings shame to the family.

The existing stigma against deaf people in some societies such as Ghana prevents parents from accepting their deaf child, building relationships with them (Goffman 1963) and providing access to a primary language (Akamatsu 1998; Fischer 1998). Parental failure to give their deaf child access to a primary language during crucial language and cognitive developmental years has long term effects on student cognitive ability (Akamatsu 1998; Erting 1994; Fischer 1998). The experiences of students at DemoDeaf reflect the subordinate relationship they face as a stigmatized deaf minority within the home which does not prepare students to enter schools ready to learn. Also, familial rejection is incorporated into the child's psyche and the ascribed status becomes part of his or her own identity (Lane 1992). Unfortunately, these negative ascribed identities are reinforced within schools such as DemoDeaf

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<sup>11</sup> In 2007, students at the Senior Secondary School were still being subjected to aural national exams as hearing students.

The institution of the school reinforces the power imbalance between hearing and deaf people, negative stigma, and stereotypes against deaf people as the normative culture is embedded in the teachers who teach DemoDeaf students. Hearing teachers at DemoDeaf are products of the larger social world. They value auditory and oral languages such as Twi and English and do not necessarily see a need or feel an urgency to learn GSL. DemoDeaf teachers undergo years of training at the University College of Special Education at Winneba. However, when they arrive at the school, they come without an understanding of the student body's primary language or even the sophistication of GSL, students' life experiences, culture, and so forth. Insufficient training and preparation at the teacher training colleges and universities also appears to contribute to the negative attitudes toward deaf students, low student expectation and teacher burnout.

The findings of this case study show how the normative culture and the stigma against deaf people influence the institutions of the family and school. The general attitude the larger hearing majority has towards deaf people directly affects the language family members give deaf children access to and how deaf children and adults are treated in the family. In addition, to the general attitude hearing people in Ghana feel toward deaf people, the hearing majority's ideas on education and rehabilitation for deaf people influence the quality of education provided by the school and teachers at DemoDeaf. As a result of the normative culture, the socializing institutions of the family and school inadequately prepare students for a quality education and the school itself does not provide access to quality education. Instead, DemoDeaf resembles more of a place for

family members to send Deaf children because they do not know what else to do with them.

#### Policy Implications

##### *The mathematics program and the Ministry of Education.*

The mathematics program is an effective tool for NGOs who work with deaf schools in Ghana as it has demonstrated it can raise students' math skills. However, as mentioned before, the math program appears to be treating a symptom of low math skills and not the heart of the issue which is the need for teachers fluent in GSL and the need to stop the perpetuation of the stigma against deaf people. Because it will take time for teachers at Deaf schools to become fluent in GSL and to educate people about deaf people and how they are equal to hearing people, the program would be an effective tool for the Ministry of Education to adopt and encourage other service organizations (such as the Peace Corp) who work with Deaf schools to use. As NGOs work to help students at their actual ability level, the Ministry of Education can focus on better preparing teachers for deaf schools. The Ministry of Education can also take the fundamental principle of the program and have these other non-profit organizations that help teach at deaf schools bypass nationally mandated curriculum, and instead offer remedial courses on reading, writing, and arithmetic. As NGOs and the government work together, immediate and long-term solutions can be implemented to better the quality of deaf education in Ghana.

##### *Education policy.*

In 2005 and 2007, the purpose of deaf education did not seem to be to empower deaf students with secular knowledge, but to provide an institution, in the guise of a school, for the members of the hearing majority to send deaf people to. The state of deaf education does not have to be like this. There are several promising changes that can be

made at schools in hiring practices, and policy changes that if implemented and monitored may work to improve the quality of deaf education at DemoDeaf and other deaf schools throughout the country.

The deaf educational system needs to be tailored more to the student body they serve. The hiring of deaf administrators and more Deaf teachers, who know GSL, deaf culture, and the experiences of deaf students, will make this tailoring process possible. There are many capable deaf individuals in Ghana who can fill these roles. However, an emphasis on interpreter training and a way of evaluating interpreters needs to be implemented to give these very capable individuals equal access to these positions.

Several Deaf Ghanaians who are currently searching for ways to improve Deaf education have attended, are attending, or are trying to attend teacher training colleges in Ghana. An obstacle these men and women face, however, is that they are given interpreters who have little or no GSL training. I learned from an interviewee recently that at one school the interpreter had a GSL class five years previously, had not signed since then, nor could sign her name when she arrived at the school. She said she was given the job because she knew the Headmaster.

My informant explained that the students felt that they could not complain for fear that if they did, the interpreter would be removed. If this were to happen, then the deaf students would not be able to enroll in any classes until another interpreter was found. They agreed they were better off trying to learn the material themselves with the front of an interpreter. Two students in particular already had to wait two years before continuing their classes because they could not register for a class without an interpreter. Experiences such as these are not unusual among the deaf in Ghana. The need for more



interpreters and interpreter evaluation and monitoring is growing and will continue to grow as the deaf begin to claim more of their rights as capable citizens of Ghana.

Hiring Deaf teachers who are fluent in GSL and identify with Deaf people will automatically make education more accessible to deaf students. This too would eliminate or minimize the amount of time and resources these teachers would need at Winneba. DemoDeaf has already begun the process of hiring deaf teachers. There is currently one Deaf teacher at the JSS and a Deaf librarian for the Primary and JSS departments. The differences in the relationships of trust and respect between these two teachers and students are very obvious when compared to most hearing teachers at DemoDeaf.<sup>12</sup> By having more deaf teachers in close proximity to hearing teachers, hearing teachers may be more apt to get to know deaf people and see them as persons instead of tokens or stigmatized persons.

The way hearing teachers treat deaf peers also needs to change. I have seen differences in the way hearing teachers treat and respect other hearing teachers compared to deaf teachers. Hearing teachers often revert to the culturally ascribed social status of the deaf and appear to tell the deaf teachers and adults what to do rather than engage in conversations. Extra steps or mechanisms need to be put in place to train hearing teachers how to work with deaf peers.

Teachers at deaf students need to be fluent in GSL. The effort to increase GSL fluency can begin both at the local level and at the national level. First, on a local level

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<sup>12</sup> There was a hearing impaired teacher at the DemoDeaf primary school and at the Senior secondary school in 2005, however, neither of these instructors used GSL often or identified with the deaf community at the time.

GSL classes for teachers at deaf schools like DemoDeaf need to expand GSL curriculum to include not only vocabulary and simple sentences, but also the use classifiers, space, and even Deaf culture. To increase fluency among teachers GSL classes should be mandatory and sanctions should be enforced when faculty are absent. Valuable resources for more in depth training may come from professors and students from Gallaudet University and especially the World Federation of the Deaf. Local universities with departments such as anthropology, sociology, Education and Special Education, or linguistic departments should also be encouraged to conduct research on the Ghanaian Deaf Culture and GSL.

On a national educational level, the movement to increase GSL fluency among teachers at Deaf schools needs to begin by changing curriculum and graduation requirements at the University College of Education at Winneba. Curriculum needs to include advanced courses on GSL, the debate between natural versus artificial sign systems so teachers may recognize one from the other, and courses on Deaf Culture, the Deaf Community, and other Deaf education issues. Also, the promotion of deaf people as a linguistic minority, not disabled, will also help the current mindset of the hearing teachers change to a mindset that respects the deaf as strong contributors to society. Changing the requirements of potential teachers at Winneba is an ideal because these graduates will have the most contact with students at the deaf schools. Training teachers currently at the Deaf school will help them to improve as teachers now instead of waiting for the next generation of teachers to improve the deaf education system.

The hidden curriculum taught to the students by teachers is a result of their assumptions, ideologies, values, teaching strategies, and especially communication

abilities. If educational systems continue to place teachers in schools where they do not understand nor use the same language as their students, then the quality of education at the school will most likely never improve, and deaf schools and students will continue to internalize the negative stereotypes as communicated through negligent schooling and attitudes of some teachers of the deaf.

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## APPENDIX A. VOLUNTEERS AS INTERPRETERS IN THE CLASSROOM

A basic tenet of the *Registry of Interpreters Directory Code of Ethics* for ASL interpreters in the U.S.A. is that an interpreter is to “facilitate communication access and equality” (2005). However, because student vocabulary levels and knowledge of incidental information are so low, interpreting DemoDeaf classroom lectures are very complicated. DemoDeaf teachers seem to assume that by placing an interpreter in the room the students will automatically understand the lecture covering government mandated curriculum even though students appear to be at the level of young primary school students. DemoDeaf teacher do not seem to realize that the language barrier between students and teachers is not new and has most likely plagued their whole schooling experience. As a result the students have not learned most of the curriculum up to this point. Therefore, teachers cannot just pick up where they last ended the class session previous just because an interpreter is there.

## APPENDIX B. THE BOOK CLUB

The Book Club was a successful after-school program because it stimulated student interest in books, reading, and storytelling through Deaf mentors from the local Senior Secondary School for the Deaf (SSS). The Book Club was hosted by the Deaf school librarian was held every Tuesday and Friday in the library.

The Book Club received special permission from the Headmasters at DemoDeaf and the SSS for SSS students to come every Tuesday to mentor students in the Book Club. Deaf mentors took turns preparing stories from selected books to share in GSL, practiced storytelling with DemoDeaf students, and talked to students about school and what they can do to make more of their time in class. Every Friday students were given the opportunity to think creatively through coloring books, picture drawing, and completing activities in *Highlight's* magazines. These magazines had activities such as connect-the-dots, word searches, and find the hidden object in the picture.

Four JSS students were selected to act as chairmen for the Book Club. These chairmen were responsible for selecting a book every week from the library to give to the SSS students to prepare to share with the club. They were also responsible for the Book Club publicity and drew posters with a picture representing the story and posted them on the announcement board in the school hallway and the cafeteria

Four SSS students were invited to be coordinators responsible for assigning weekly mentors. These four students also held the positions equivalent to the student body government at the SSS. The four SSS students proved to be an important resource. They knew which SSS students were capable of reading to the children and which students were not as literacy is an issue at the SSS as well. The low literacy rates at the

SSS suggests that the problems at DemoDeaf may be common problems across the country. It also suggests that the students at the SSS, just as I believe it is among the JSS, all know each other's scholastic abilities since they spend nearly every day together in the same classroom day in and day out including weekends.

The Book Club appears to have been a big success. The JSS and primary students really enjoyed interacting with the SSS students. In fact, the SSS students really enjoyed being with the JSS and primary students as well. The SSS coordinators made promises to each other to continue to visit fellow Deaf. They explained that it was their responsibility and duty. If they do not help themselves, they reasoned to each other, "Who will?" The SSS students also met a student from the Deaf and Blind unit. They were impressed with her ability to read Braille and sign. A couple of SSS students promised to meet with her more often to read to her personally. Two years later in 2007, I found that these same SSS students had kept their promise to this student.

The librarian, eight students, and even vocational teacher were committed to help the program run while I was there but, the Book Club was soon abandoned after I left. When reflecting on the program after I departed Ghana, I came to the conclusion that benefits of the program are actually immeasurable. However, the complexity and the amount of time and energy required to maintain it by volunteers might not make it the most feasible program. Alternatively the program would have to be formalized and adopted as an after-school program by a DemoDeaf teacher.

## APPENDIX C. CONSEQUENCES FOR CHEATING

I established a no cheating rule in the math program in 2005. The punishment for cheating was to cut grass or mow the lawn. This is done manually at DemoDeaf with machetes. The first student caught was sent to cut a large patch of grass by the clotheslines. After returning to the school the next day and finding that the grass was not cut, I arranged for a chair to be brought to that spot after school and sat and read my book while he cut the grass. When I left for a short moment to take care of some business, he recruited three of his friends to help him with his work. I found this to be unacceptable and quadrupled the amount of cutting for all four boys to do.

The original student who was caught cheating and I exchanged some heated words. I reminded him that I did not have to come all the way to Ghana to work with him nor did I have to take the time to actually give him access to knowledge. But, I did it because I knew he and the rest of the students deserved more. After this exchange, his attitude and the attitudes of many other students changed. They paid more attention in class, focused on their own work, and even orchestrated individual and collective ways of showing me appreciation for the time I spent with them.



## APPENDIX D. ASSIMILATION OF DEAF STUDENTS THROUGH INTEGRATION PROGRAMS

In addition to using language as a means of assimilation, educators attempt to assimilate deaf students into the larger hearing-world by placing them into hearing classrooms and/or schools. Mainstreaming programs place students into hearing classrooms where they are usually the only deaf member of the class (Stinson and Anita 1999). Deaf students may rely on speech or lipreading techniques in the classroom or an interpreter or transliterator. However, the presence of an interpreter or transliterator does not guarantee the student will receive the same subject content as being taught by the teacher (Jones et al. 1997; Stinson and Anita 1999).

The hiring process for interpreters and transliterators fall under the responsibility of administrators who often do not recognize the differences between interpreters and transliterators nor do they know how to judge a good interpreter or transliterator. Transliteration occurs between English and manual representation of English while interpreting occurs between English and a natural sign language like GSL or ASL. Because administrators are not fluent or familiar with the various kinds of natural and artificial sign systems, they do not know how to assess interpreter or transliterator skills. As a result, many under-qualified interpreters are placed in Deaf student's classes (Jones et al. 1997; Humphry and Alcron 1994).

Another obstacle preventing students from equal quality education in mainstream classrooms is confusion between teachers and interpreters regarding the interpreter's role in the classroom (Jones et al. 1997; Lane 1992). The teacher at DemoDeaf who shrugged off his responsibility of ensuring that his students understood the lecture when I was

interpreting is an example of this confusion at DemoDeaf. In mainstream classes it is not unusual for teachers to expect interpreters to tutor students, grade homework, remind the deaf students of deadlines, and so on. This role confusion may further the gap between hearing teachers and deaf students so much that the teacher may not know what the deaf student may or may not be struggling with.

Deaf students are faced with other challenges in the classroom prohibiting true class membership and participation. In instances in which students are supposed to shout out answers or suggestions simultaneously, the deaf student will not be able to hear all of the answers given by peers nor will the interpreter be able to interpret them all at the same time (Lane et al 1996). If the deaf student would like to answer a question or shout out a suggestion, he or she will not see the question signed until moments after instructions because of interpreter lag time. Having an adult interpreter follow them most of the day at school including recess, informal group gatherings, and in the classroom make it difficult for students to make friends (Harris 1995; Oliva 2004) and hold consistent conversations with peers.

Other integration programs include inclusion (where more or less half the students are hearing and the other half are deaf), separating deaf students in their own classroom or unit in the same school, and resource rooms where deaf students receive extra tutoring or remedial instruction. Integration programs may also have implications for social development.

Programs that follow the oralist philosophy, TC, and integration approaches have been beneficial for some, but for many more, these programs have brought frustration and heartache (Corker 1996; Harris 1995; Higgins 1980; Lane 1992). Perhaps most

telling are the numerous accounts that Deaf adults give of their struggles and their constant calls for the use of natural signed languages as primary languages. Many deaf individuals who have attended these integration programs report feelings of social exclusion, isolation, negative self esteem, and the formation of poor deaf identity. Never can a deaf person be completely relaxed or sure that he or she knows what is going on because they cannot hear other students and teachers talking in front of them, behind them, or to their sides (Higgins 1980; Harris 1995; Oliva 2004). Many Deaf individuals, therefore, often advocate for residential schools for Deaf students as a solution.