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Schooling in American Sign Language:
A Paradigm Shift from a Deficit Model to a Bilingual Model in Deaf Education

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Abstract

   Deaf people have long held the belief that American Sign Language (ASL) plays a significant role in the academic development of deaf children. Despite this, the education of deaf children has historically been exclusive of ASL and constructed as an English-only, deficit-based pedagogy. Newer research, however, finds a strong correlation between ASL fluency and English literacy, supporting Deaf people's belief. This article describes efforts at the University of California, San Diego to develop and field-test a teacher preparation program that combines best practices in bilingual education and deaf education. The training curriculum designed for this program incorporates cultural practices from the Deaf community into the training of teachers of deaf children, a paradigmatic shift from traditional deaf education pedagogy based on a deficit model to a socio-cultural view of deaf children and their schooling. This shift represents a significant new direction in addressing the chronic poor performance of schools in educating deaf and hard-of-hearing children who as a group are severely undereducated. This article also provides background and rationale for the recent approval of ASL authorization on the Multiple Subjects teaching credential in California.

Keywords: Deaf Education, American Sign Language, Bilingual Education, Visual Language, ASL Authorization

   Historically, Deaf[2] people have been excluded from both the construction and organization of their own education. This article is intended to encourage reflection on schooling in American Sign Language (ASL), particularly on the idea that Deaf people know how to educate themselves. It also considers how a repertoire of teacher knowledge, skills, and tools that primarily originate in the Deaf community can infuse and enrich educational practice with the outcome of life-long learning, equity and social justice for deaf children.

   In 1998, in response to emerging research establishing a link between ASL fluency and English literacy skills, the Teacher Education Program (now the Department of Education Studies) at the University of California, San Diego (UCSD) applied to the California Commission of Teacher Credentialing (CCTC) to implement a new nontraditional program of study under the Commission's designation of "experimental"

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programs. The proposed experimental program was relatively simple in nature: to train future teachers of deaf and hard-of-hearing children to meet the requirements for the bilingual (BCLAD) credential and to grant these teachers both the bilingual teaching credential and the Deaf and Hard-of-Hearing Specialist credential. The latter was the required credential to qualify teachers to teach deaf and hard-of-hearing children in California schools. The language proposed for approval under this experimental BCLAD credential was American Sign Language. After a hearing of the Commission, the program was approved. It has trained over 50 teachers to date.

The program at UCSD was a response to what the Department of Education Studies believed to be a serious crisis in educating deaf students in California and elsewhere. On exit from high school, only 8% of deaf students and 15% of hard-of-hearing students score proficient or advanced on the California Standards Test for English-Language Arts and only 10% of deaf students and 18% of hard-of-hearing students score proficient or advanced in math (O'Connell, 2007). These are unacceptable outcomes and point to the urgency to transform deaf education practice. Thousands of deaf and hard-of-hearing children in California alone experience extremely subpar educations under historical deaf education practice. Our response in 1998 was to adopt a different approach to the challenge of improving educational outcomes for deaf students.

Now, however, the CCTC has moved away from a bilingual credential to a bilingual authorization on the Multiple Subjects Credential for all languages. The UCSD ASL bilingual program was originally approved for the bilingual credential (BCLAD). The BCLAD credential is no longer used. Programs that wish to continue to offer bilingual training (in any language) must write, not to standards for a bilingual credential, but to the Multiple Subjects credential with language authorization. To continue the focus of the program at UCSD, such a language authorization was requested for ASL, adding it to the list of languages for which authorization can be approved. Recently, this authorization was granted by the CCTC and represents a significant acknowledgement that training in bilingual pedagogy for deaf and hard-of-hearing children is no longer just experimental but an option that training institutions can offer under regularized standards and accreditation.

This article has several purposes. The first purpose is to provide the social and historical context for a paradigm shift from "special education" to "bilingual education" for deaf and hard-of-hearing students. Thus, it begins with a brief discussion of the social change in how Deaf people view themselves to provide the context for this paradigm shift. A second purpose is to provide the research base for reframing the education of deaf children as a bilingual enterprise, which appears in the article in the form of a brief literature review. A third purpose of this article is to acknowledge that schooling in ASL is not only a bilingual proposition but a bimodal one as well. Thus, we discuss the importance of visual learning, not only for deaf students but for all students. A fourth purpose is to provide insights into what it means to do school in this way (what is called here, for lack of another name, "schooling in ASL") by engaging in a discussion of the development and implementation of the training curriculum in ASL-English and bilingual deaf education at UCSD. The final purpose of this article is to propose areas of future work necessary to fully understand and implement a shift in pedagogy of this nature.

A Narrative Shift in the Deaf Community

In the 1970s and into the 1980s, a new discourse about ASL and a Deaf culture emerged that rivaled, and even contradicted, traditional explanations about deaf people. This discourse framed ASL as a language and viewed ASL-using Deaf people as comprising a vibrant American deaf culture, opening up a new narrative of signed languages and Deaf cultures around the world (Baker & Battison, 1980; Bellugi, Klima, & Siple, 1975; Coye, Humphries, & Martin, 1978; Padden & Markowicz, 1976; Siple, 1978; Supalla & Newport, 1978). Since that time, a great deal of literature has focused on describing an active and stable linguistic community (Baynton, 1996; Lane, 1992; Lane, Hoffmeister, & Bahan, 1996; Padden & Humphries, 1988, 2005). This description is of an American Deaf community that now comprises several hundred thousand signers of a language that traces back at least 300 years (Lane, 2011; Padden & Humphries, 2005). The diversity of the community has also come to the fore, with the voices of Deaf people of African, Latino, and Native American heritage being increasingly heard (Christensen & Delgado, 1993; Gerner de Garcia, 1993; Hairston & Smith, 1983).

A central characteristic of Deaf people's view of themselves in this new narrative is particularly relevant to this paper. They see themselves as a linguistic minority, a descendant community of language users who have transmitted their language over many generations despite the denial of their legitimacy by general society and the sciences. Deaf people's concerns about social justice are often about their right to language autonomy similar to the concerns of many other language minority cultures in American society (Humphries et al., 2012). A second characteristic of this modern narrative shifts the traditional focus from hearing loss to a focus on language and culture. Deafness, or the absence of hearing, is not primary in the new narrative. Instead, the narrative is one of wellness: a well mind in a well body. There is no deficit within the body; it is only different. Analogies to other minority communities seems apt here: an African American is not a non-White person, a woman is not a non-man, and a Deaf person is not a non-hearing person (Bauman & Murray, 2010; Humphries, 2004).

A bilingual pedagogy for deaf students is evocative of these central perspectives from within the community. Such pedagogy brings to the forefront the role of ASL in teaching and learning, whereas historically, ASL has not been considered an academic language. A culture of Deaf people in a bilingual narrative also suggests alternative learning pathways and strategies such as an orientation to visual language and visual learning. The role of ASL in supporting the learning of English is also a central perspective that is highlighted in a bilingual education narrative.

Research Basis for Schooling in American Sign Language

What is the basis for this shift to a bilingual approach to teaching deaf children? What historical and current research supports this change? The basis for ASL pedagogy began with the linguistic acceptance of ASL in the family of languages. Hundreds of linguistic studies of ASL highlighted its phonological structure, growth processes, grammatical features such as verb classes and verb agreement, word order (SVO), inflectional processes, and much more (Battison, 1978; Bellugi & Studdert-Kennedy, 1980; Humphries, Padden, & O'Rourke, 1980; Newport & Meier, 1985; Padden, 1986, 1988; Stokoe, Croneberg, & Casterline, 1965; Supalla, 1985). Close study of ASL and

other signed languages established them as having structural properties and acquisition patterns similar to those of spoken languages, including similar stages and pace of acquisition (Klima & Bellugi, 1979; McIntire, 1977; Petitto, 1985). Additionally, a field of Deaf Studies, research into the social and cultural lives of ASL signers, established itself. (Kannapell, 1974; Markowicz & Woodward, 1975; Padden & Humphries, 1988; Padden & Markowicz, 1975, 1976; Woodward, 1982).

These research developments challenged notions within the centuries-old deaf education tradition. Two of these notions were that ASL was not a language and, therefore, of limited value for higher level cognition (Myklebust, 1960), and that Deaf signers think without language (Furth, 1966). The common rationale for banning signing in schools arose from the belief that sign language was not natural language and that if deaf children were "allowed" to sign, they would never learn to speak (Baynton, 1996). Only deaf children deemed hopelessly language-delayed were placed in a "manual" classroom where there was signing (Jacobs, 1980).

Signing as a "last resort" suggested an inequity between spoken languages and signed languages in the context of schooling. Children were often in classrooms where they could neither comprehend nor access the language of instruction, English, in which content knowledge was being offered. And, perhaps more relevant to schooling, children were often denied the language resource that was comprehensible and accessible to them, ASL, and the prior knowledge that could be brought to bear in the classroom via ASL. The lack of recognition of the value of a language other than English in school evokes experiences of other linguistic communities, particularly those of Spanish-speaking students in public schools (Ovando, Combs, & Collier, 2006; Santa Ana, 2004).

The shift away from these deficit-models toward the new view of ASL has not been limited to Deaf people and linguists. Public consciousness about ASL as a language has grown tremendously in the past 25 years. Most colleges and universities today, and many high schools as well, offer ASL classes. This proliferation of interest in learning ASL by hearing people is one sign of the new view of ASL. The irony that signing has become a desired language goal of people who hear but not necessarily considered a language goal of deaf children is not lost on Deaf people themselves. More than ever, Deaf people's sense is that ASL is essential to the academic success of deaf children (National Association of the Deaf [NAD], 2008). The following sections discuss how this sense is supported by recent research.

Visual Learning and Visual Language

The centrality of visual learning and visual language in the development of children and in deaf children, in particular, is derived from recent research. From data collected in naturalistic contexts, Deaf signing teachers and caregivers actively engage, manage, and direct the visual attention of Deaf children (Crume & Singleton, 2008; Lieberman, 2008). These studies, among others, show that, by the age of four, ASL-signing Deaf children are able to self-regulate attention to a visual language. Their self-regulation is achieved by careful and constant orchestration of visual gaze and engagement on the part of the adult, especially in contexts involving competing visual input such as book-sharing. Lieberman (2008) found a strong correlation between the number of appropriate and successful visual bids for communicative attention and the child's scores on an ASL

vocabulary inventory (Anderson & Reilly, 2002). Critically, then, teachers must be able to engage the attention of visual learners such as Deaf and hard-of-hearing children.

While skill in visual attention among Deaf children learning sign language may not be a surprising result, it dovetails with recent work showing a significant role of visual gaze and attention in hearing children's development of spoken language processing skills. Early visual skills, particularly the ability to quickly find a picture in an array, predict later reading performance (Fernald, 2008). Rapid visual response is an early indicator of a child's ability to make predictions about language input that aids in comprehension skills needed for reading. It appears that visual learning, which develops along with visual language, is crucial in these correlations.

Early visual language socialization of Deaf children results in the unique adaptation, and possibly acceleration, of visual and joint attention capacities (Harris & Chasin, 2005; Mather, 1990; Waxman & Spencer, 1997). Unlike hearing children, object exploration and receiving caregiver linguistic input in Deaf children requires sequential or alternation of gaze, which can be hypothesized as a more demanding type of visual attention. Sequential or alternation of gaze is necessary to take in both object and signed input, unlike gazing at an object and listening to a speaker simultaneously. Learning to keep focus on an object while taking in linguistic input, and vice versa, is a developmental task acquired over time. These demands may also lead to accelerated development of executive functioning and language development (Corona & Singleton, 2009). Teachers, then, must be able to note this facility in Deaf children and to help them develop it if development is not emergent.

Investigation of Deaf mothers' behaviors that elicited and sustained their toddler's visual attention, as well as the child's developing repertoire of self-regulatory attention strategies, especially in the context of book-sharing, is instructive in this regard (Lieberman, Hatrak, & Mayberry, 2011). The child's ability to alternate gaze between pictures and language input during joint storybook reading sets the basis for the acquisition of literacy skills. Managing divided visual attention between signed language input and English print on the page has long been thought to be a particularly effective bilingual strategy of Deaf mothers with their Deaf babies. Teachers need to understand how Deaf parents structure and support, visually and linguistically, their children's language development during storybook reading. Deaf mothers mediate between ASL and English print when reading books with their children and Deaf mothers accommodate their use of language to their child's developing signing skills.

But despite these suggestions that visual language and visual learning are crucial, the persistent belief that reading a spoken language like English requires phonological coding has distracted deaf education from considering other pathways that might be logical for deaf children in learning to read. In a meta-analysis of research examining phonological coding abilities in deaf students who were educated in a variety of communication modes (i.e., speech only, speech and sign, sign primary), Mayberry and her colleagues first screened the studies for research design and integrity and examined the remaining 58 studies. They found that fewer than 50% of these studies found evidence of phonological coding in deaf students (Mayberry, del Giudice, & Lieberman, 2011). Within this set of studies, only 25 measured reading ability directly; Mayberry and colleagues' analysis demonstrated that phonological coding only predicts about 10% of reading outcome.

They also found that ASL proficiency, on the other hand, correlated most highly with reading achievement. Specifically, they found two factors correlated with reading achievement: ASL fluency and exposure to print. The correlation between exposure to print and literacy, however, only holds in the presence of ASL fluency, which suggests that an emphasis on visual language development activities as a path to successful reading acquisition may serve as a better model of instruction for these students.

The Link Between ASL and English Literacy

Research reveals two types of links between ASL and English literacy. Early research on the development of literacy skills in deaf and hard-of-hearing children demonstrated that Deaf children of Deaf families (where ASL is the language used at home) tended to be successful readers and writers and were more socially and culturally knowledgeable than deaf children of hearing families (Corson, 1973; Meadow, 1968; Stuckless & Birch, 1966). These studies suggest that practices in the Deaf community and Deaf families produced bilingually (ASL-English) competent Deaf and hard-of-hearing children. Because these are practices of a linguistic and cultural community of signers, they can be regarded as indigenous practices that the people of this community engage in and share with each other over generations (Humphries, 2004; May, 1999; Reagan, 2004). This line of research suggests that Deaf teachers who go into classrooms to teach deaf and hard-of-hearing children may intuitively create curricula and learning environments that are strategically compatible with these children's specific learning needs (Humphries & MacDougall, 2000). It suggests also that fluency in ASL, experience in the Deaf community, and pedagogical training are desired elements for training both Deaf and hearing teachers of deaf students.

Additionally, research also reveals an underlying proficiency link between ASL and English (Cummins, 1979). Cummins's theory of Common Underlying Proficiency (CUP) found that crossing the threshold in development of a first language aids in the acquisition of a second. In the 1990s, the research program on language and literacy at UCSD investigated both types of links. Several studies gathered student test scores and classroom interaction data from two schools in California. The results of this investigation indicated a correlation between Deaf children's fluency in ASL and higher Scholastic Assessment Test (SAT) reading scores. Furthermore, an examination of classroom interactions between teachers and students revealed that Deaf and hearing teachers, even when all are signing teachers, organized information and structured instruction in their language use differently while teaching (Humphries & McDougall, 2000). Among other differences, Deaf teachers made many more frequent connections between ASL and English while teaching than hearing teachers. The correlation between ASL fluency, English language, and literacy development and the finding of ASL fluency as a predictor of reading ability were corroborated by several other studies in this same time period (Hoffmeister, de Villiers, Engen, & Topol, 1998; Padden & Ramsey, 1998; Prinz & Strong, 1998). With the link between ASL and English literacy established, the basis for schooling in ASL became clearer and stronger.

Other studies suggest how ASL interactions and communicative practices among Deaf people affect English literacy. A number of researchers investigated interactions between signing Deaf adults and Deaf children in Deaf families and communities,

hypothesizing that Deaf families must be doing something in their daily lives to produce not only bilinguals but also children able to read and write in English. These studies identified the ways that Deaf people link ASL and English in everyday life, such as the specific ways Deaf mothers sign to their Deaf babies (Blumenthal-Kelly, 1995), the use of eye gaze to regulate Deaf children's attention getting and turn-taking (Mather, 1990), the way Deaf children learn to associate fingerspelling (a component of ASL) with the acquisition of print (Padden, 1991; Padden & Ramsey, 1998), and the associative skills (such as the ability to copy a finger-spelled word on paper, or the ability to associate the initial hand shape used in a sign with letters of the English alphabet) that link ASL fluency and reading (Padden & Ramsey, 1998). These findings suggest that links between a signed and spoken language contribute to Deaf bilingualism.

Deaf Bilingualism, Language Learning Theory, and Social Diversity

The recognition of ASL as a language in the 1970s and 80s was accompanied by new interest in Deaf people as bilinguals. Gee and Goodhart (1985) recognized early on that ASL was a visual language and that deafness did not in any way impair its acquisition. Instead, the acquisition of spoken languages was affected by deafness. Looking beyond early recognition, the interest in Deaf people as bilinguals is best typified by Francois Grosjean's work (1992, 2001, 2010) which described bilingualism of Deaf people not only as the use of two or more signed languages but as a form of minority language bilingualism. Deaf people were recognized as using both the minority language (sign language) and the majority language (in spoken or written form). Grosjean considered it critical that deaf children be brought up bilingual with sign language as the primary language and the majority language as a second language. These two ideas, that a visual language is a pathway to language for deaf children who might otherwise not be able to access language presented to them aurally and that the language situation of the community of signers is akin to that of many other linguistic minorities, are central to entry into a bilingual paradigm in education of deaf children.

Newer theories of first and second language learning have also lent support to the plausibility of bilingual pedagogy for deaf children. Theories about the social nature of learning and development, the relationship between first and subsequent languages, the nature of first and second language learning, the mediation and distribution of learning and other theories seem to echo Deaf people's knowledge about how Deaf children become literate and academically successful. For example, Cummins's theory of linguistic interdependence, particularly his two-threshold model, took on special meaning in a theory of bilingual education for deaf students (Cummins, 1979). His theory that developing a threshold in one language can aid the attainment of proficiency in another language is especially important in light of the fact that many deaf children arrive at school without having crossed a first-language threshold. They may not have been exposed to a visual language at home and may not have had sufficient access to a spoken language either. Cummins (2006) concludes in his review of the research that data clearly shows that Deaf students who have developed ASL proficiency have a significantly better chance of attaining English literacy.

Early proposals to apply second language acquisition theory to the learning of English by deaf students, ironically, did not include consideration of ASL in the way that

Cummins (1979) envisioned two languages interacting. Initial attempts to treat English as a second language for deaf students resulted in an adoption of second language methods, such as transformation and substitution drills, which taught English in isolation from ASL. Krashen's (1985) theory of comprehensible input clarified for teachers that ASL offered a way to make input comprehensible when teaching English. As a visual and signed language, ASL is most accessible and most reproducible for deaf students.

The classrooms where deaf and hard-of-hearing children learn English and/or ASL are linguistically and culturally diverse places (Allen, 1998; Cohen, 1993; Humphries, 1993). In these classrooms, particularly in urban settings, we often find deaf and hard-of-hearing children who may or may not be fluent in ASL or English, may be fluent in one language but not the other, or may or may not be fluent in the language(s) of the home, including spoken languages (e.g., Spanish, Russian, Hmong) and signed languages (e.g., Mexican Sign Language, Puerto Rican Sign Language). These linguistic and cultural heritages are by no means a complete list of the variations among deaf and hard-of-hearing children in our schools. This diversity is multicultural in nature and adds a multilingual dimension to the paradigm shift from a special education pedagogy to a bilingual pedagogy. The diversity of deaf students suggests the appropriateness of dual and multi-language strategies rather than monolingual ones.

Schooling in American Sign Language

With this large and varied research base in mind, it is important to now turn to an examination of how bilingual schooling is perceived by the Deaf community. "Schooling in ASL," as a concept, has no specific name in English; it is a translation, a paraphrase, for the concept of the centrality of signing to learning and development. The English phrase is not used widely, if at all. It does, however, make sense in terms of how we understand the vision that Deaf people have for the education of deaf children. The difficulty of articulating the vision is not one of words solely. The paradigm shift, the difference in pedagogy between traditional and bilingual deaf education, needs to be defined. Bilingual pedagogy is an existing pedagogy that aligns with both Deaf people's desire to educate their children with ASL and the knowledge Deaf people feel they have about how deaf children learn. But, to be clear, bilingual education as applied in Deaf Education is a close, but not necessarily perfect, manifestation of schooling in ASL. The following discussion of schooling in ASL seeks to clarify how Deaf people see the manifestation of schooling in ASL and why bilingual education fits best.

How Deaf People Would Educate Deaf and Hard-of-Hearing Children

Although there are many people—young and old—with "hearing impairment" and while there will certainly be disagreement on what is the best way to educate deaf children individually and as a group, the fact remains that current approaches show poor results (as discussed earlier). Schooling in ASL is what Deaf people believe is the best, most intelligent, and most natural way to educate deaf children (Padden & Humphries, 1988, 2005).

What would it look like if Deaf people's knowledge about what works were to dominate in our educational planning and implementation for deaf children? Deaf people have memories of their experience with school and with learning. They recall what

worked for them and what did not; they remember the "good" teaching as well as the "bad." They also have a sense of how to access learning as a deaf child, have knowledge of what it takes to be a deaf learner, and understand how to engage deaf children (Singleton & Morgan, 2004). These memories and knowledge about how deaf children learn are not gained through professional training. Deaf people's experiences in schooling should act as valid and rich source of information to transform practice. The following examples illustrate this. These excerpts are from a two-day symposium held at UCSD in 1992 in which Deaf parents and professionals participated in discussion about the education of deaf children.

From G., a Deaf mother during a discussion about raising deaf children (translated from the ASL):

> You worry about whether to use ASL or English, which kind of school, right? Your own experience in school (signs lousy, low language achievement, emphasis on English is better, English has higher status), and you find you have a deaf child, and you face the same problem you yourself went through. You do not want to go through with that again, being brainwashed from that experience, now with your child, you feel confused. You feel no bonding with your child when you try to use English-like signing; it feels unnatural. So you use your intuition to have a good relationship with your child, which is more important than which language to use—how many of you as children have gone through that negative experience that influence our decision on which language to use with our children? And now with ASL research, we get more support and feel confident about deciding to use ASL. (as cited in Humphries, 2012, unpublished manuscript)

G. referred to the language choice that is often forced upon parents and students in traditional special education and how it negatively impacted her and her relationship with her child. As stated earlier, traditional Deaf Education has been effectively monolingual, either forbidding signing in the classroom outright or allowing signing only in English grammar, not ASL.

And C., a Deaf teacher, made the point that Deaf people's knowledge of how deaf children learn and the visual modality is what is needed (translated from the ASL):

> Unlike learning ASL for communication, literacy is culturally dependent. For those who did not have opportunity to learn how to read and write in school but have ASL, we could plan remedial classes to help teach them literacy but for those who don't have a language, something is very wrong. That's why we ask those [Deaf] parents to share with us their techniques, the "how-to's", to teach children literacy in our culture. Hearing culture depends on phonics to decode words, we need to base ours on our first language (ASL) to teach our children literacy through a visual modality. (as cited in Humphries, 2012, unpublished manuscript)

Walworth (1990) provided the following conversation taken from a panel discussion of Deaf participants held at the 1990 Teaching English to Speakers of Other Languages (TESOL) conference:

M: I now teach in the California School for the Deaf at Fremont, where I experiment with innovative approaches in my English classroom. I have come to the conclusion that efforts within the classroom, by themselves are not enough. We need to look at the larger picture and change the system so that Deaf children can become successful learners of English. My personal belief is that ASL is the means of achieving that end.

D: It is true that many programs in Deaf education history have been unsuccessful because of mistaken ideas. For example, the total communication philosophy spawned a whole variety of invented sign systems…The systems were based on misconceptions regarding how effective language learning for Deaf children takes place…we've arrived at a point where we know the Deaf view will work in the educational system. We need to begin now… and it will work, because we've never before had Deaf people actively involved in the Deaf education system.

M: A person's first language must be a human language, a language that is already in use, already in circulation…That is ASL. ASL is the match for the child's visually based world.

MM: One thing I have learned about language acquisition for anyone, hearing or Deaf, is that the first language is normally learned in a natural language situation…I am very interested in the idea of parallel languages: children who are bilingual learning ASL and English at the same time in a natural approach.

M: How can we measure "bicultural success" for a Deaf person? It does not mean being able to use speech. It does mean being able to manipulate English through reading and writing. It also means being able to deal successfully with the hearing world, both personally and professionally. That would be successful biculturalism.

Embedded in this discussion were both what Deaf people think works and doesn't work in educating deaf children. For example, D. called for a "Deaf view" in Deaf Education and mentioned the "total communication philosophy" and his view of it as a failure. This philosophy is one that became associated with many different communicative behaviors in classrooms around the country. It is a philosophy that holds that teachers should use whatever means necessary to communicate with their students but which, as practiced, didn't include ASL very often. Instead, it became "simultaneous communication" when teachers signed and spoke at the same time, following English word order and even altering signs to incorporate English morphology. M., in stating the need for a "human language," expressed a preference for ASL rather than what he considered the artificial signed English systems developed in the 60s and 70s that became popular in Deaf Education. These systems borrow ASL signs, alter them with new parts,

make up new signs, and detach them from semantic variations in an effort to make them conform to English. M. did not regard them as either English or ASL. His plea was for a real sign language, ASL, in schooling. His final comment in the example above argued for biculturalism and bilingualism rather than a narrow monolingual focus.

The above comments reveal a longing for aligning schooling practices to the way Deaf people think would work best. That there have been few instances in which there have been actual schooling in ASL makes Deaf people's sense of longing for a true schooling in ASL all the more a part of their folklore. Because Deaf people see the educational system as having failed Deaf children on a very large scale throughout history and today, they embrace the attempts to develop a Deaf education paradigm that is closest to what they consider schooling in ASL (Johnson, Liddell, & Erting, 1989). For many, that is a bilingual approach, or bilingual education. Bilingual education is the only existing educational schemata with which schooling in ASL seems compatible, therefore appealing strongly to Deaf people (Kannapell, 1974; Lane, 1992; Nover & Andrews, 1998). There have been some attempts to link deaf education to bilingual education over the past two decades with some state residential schools for the deaf adopting bilingual missions and working to define what such a mission means for the classroom (e.g., California Schools for the Deaf - Fremont and Riverside, Indiana School for the Deaf, Maryland School for the Deaf, Texas School for the Deaf, and charter schools in Colorado, Utah, and Minnesota). The success of these efforts is hard to quantify and is quite varied. But these schools are trying to invent a new practice, which is not an easy prospect. Many of the schools that implemented self-declared bilingual education programs did so with personnel who had little or no training in bilingual pedagogy.

Other countries have tried to implement their version of bilingual education, notably Sweden and Denmark. Measures of Deaf graduates of these programs indicate that they compare favorably with hearing graduates and test higher in reading than a sample of deaf adults from the previous generation of graduates (Mahshie, 1995). However, personal observation of classrooms in Sweden indicates that the student population varies from those found in classrooms in the United States. For one thing, they are less ethnically diverse. Also, in these classrooms, the notions of bilingual education involve one culture and two languages, and the existence of a Deaf culture is not recognized. This is to point out that while there are efforts to do school in ASL, and determined ones at that, there are not many reliably tested models. Part of the issue is that there have not been teacher preparation programs to provide the kind of expertise these schools need. The training that is needed is discussed later in this article.

The Shift From Traditional Deaf Education to a Bilingual Approach in Schooling in ASL

While the focus is on ASL as the language of communication that Deaf children share, the conceptualization of schooling in ASL begins with recognition of the multilinguistic, multicultural nature of the population of deaf and hard-of-hearing children in the United States. At the very least, these children are in homes, communities, and school environments where two languages are likely to be meaningfully present (ASL and English) and other languages (both spoken and signed) may be present as well. Deaf people interact on a daily basis with the sign language used in their community as

well as with the spoken language used by the hearing people among whom they are embedded in everyday life.

It is essential that education practices, methodologies, and teacher competencies be informed by the nature of the population. Schooling in ASL, therefore, has to be school for all deaf children, regardless of language of the home/community. The primary focus may be on development of two languages, ASL and English, but it begins with acceptance and inclusion of all languages brought to the classroom by the children and all languages they go home to in their communities. A fundamental difference between schooling in ASL and older concepts of schooling for deaf children is that in schooling in ASL, children are not segregated according to language or communication practices. Deaf education has long practiced segmenting deaf and hard-of-hearing children in many different ways (hearing levels, gender, race, communication mode) and according to changing ideas in society (Hairston & Smith, 1983; Padden & Humphries, 2005). Historically, deaf children were kept separate from each other and taught in differing ways, denying the critical mass of deaf children rich social interaction and social learning (Padden & Humphries, 2005).

The shift away from the deficit focus in deaf education has important implications also for those deaf students identified as having conditions other than deafness since approximately 39% of deaf children have an additional condition (Gallaudet Research Institute, 2011). Of these, approximately 20% are reported as having a learning disability, being developmentally delayed, displaying attention deficit with hyperactivity, or being emotionally disturbed. A shift in deaf education does not mean that these conditions are ignored in schooling in ASL. They are addressed just as they would be in any bilingual pedagogy. Supportive instruction, services, and accommodations are as much a viable part of a bilingual pedagogy as any other. And intriguingly, the question must be asked: Is the etiology of these conditions related to communicative difficulty resulting from the lack of language acquisition and visual language from birth? Would these conditions be as prevalent or as severe if a paradigm shift to bilingual education were present at the moment of discovery of deafness in the child? Although it is beyond the scope and intent of this article to address these questions, it is worth noting that the ultimate success of a bilingual pedagogy for deaf students would be greatly enhanced if the shift in how we view the development of deaf children began in early childhood and prior to schooling.

At present, it is not uncommon to find a public school that has classrooms of "oral" children, "ASL" children, "implant" children, and "multi-handicapped" children, segregated in their own classrooms on the same campus. And often, teachers are categorized according to whom they teach. The profession of deaf education seems to compel teachers to identify their beliefs and label themselves according to the "type" of deaf child they are trained to teach: "TC teachers" (those who use an approach called Total Communication), "oral teachers" (who do not use sign language), "manual teachers" (who do use sign language), and so on.

In contrast, schooling in ASL requires the collapsing of categorizations such as these into a single category of language learner. It requires enlarging the community of learners who interact with each other rather than segregating students from each other and creating small groups of socially and culturally isolated deaf children. It should not

matter if students have preferred means of communication or find other means difficult; in schooling in ASL, all of these means are possibilities for both student and teacher, but, common to both, is ASL. Code-switching and modality-switching are natural reactions to communicative situations and needs in the classroom, and ASL is the primary pathway to learning content as well as English. A central ideal in doing school in ASL is the beneficial interaction of sign and vision, languages and cultures, and even speech and hearing, in richer social environments that are viable learning environments.

Schooling in ASL involves a multilanguage classroom organization that is different from previously conceived practice. Traditionally, deaf education practice has emphasized extremely small classes, even one-on-one instruction, involving only one language, English. The practice of segmenting or isolating deaf students from each other seeks to diminish the teacher-student ratio with the belief that it is teacher attention, teacher time, and teacher-centered instruction that is most important to deaf students (Cawthon, 2001; Johnson et al., 1989; Stone, 1999).

Newer approaches to teaching and learning embrace the concept of learning as a sociocultural process in learning communities in which language and culture co-construct development (Cole & Cole, 1993; Dyson, 1993; Vygotsky, 1985; Wertsch, 1989; Wink, 2000). Social learning is a key element of school in ASL because it forms the basis for connection, not just to other people, but also to other personas such as: reader, writer, and mathematician. When deaf students do not have access to a signed language and access is not provided by English, it is difficult for students to progress from "novice" to "expert," even with extensive exposure to schooling. It is the social nature of schooling in ASL that is a unique feature of the paradigm shift. Organizational practices that optimize language, cultural, and academic interchanges between students, as well as increase the environmental stimulation to engage students, serve to decentralize learning opportunities and distribute them across the environment rather than concentrate learning in one person, the teacher. For schooling in ASL, one goal is to promote the benefits that can be gained from students negotiating meaning and sharing knowledge with each other (Vasquez, Pease-Alvarez, & Shannon, 1994).

Enhanced social interaction has another important role in the classroom for deaf children. Since many deaf children come to school from homes where they may not have had enough access to language and social mediation of meaning-making, they may need to develop a theory of mind which is crucial to understanding and interpreting the world and to acquiring knowledge in the context of school. A theory of mind allows the child to understand that others have knowledge, intentions, and the ability to generate actions that the child can learn to do as well. A study of 176 deaf children found a significant delay on theory of mind tasks for deaf children of hearing families while Deaf children of Deaf families performed the same as hearing controls (Schick, de Villiers, de Villiers, & Hoffmeister, 2007). Unfortunately, relatively fewer deaf children are in homes with rich signing environments.

Engaging students in the social world of the classroom is how students become part of a learning community. If students don't attain a level of engagement with the social world around them before coming to school, this becomes a more pressing concern in the classroom. Students can join a community of learners when they are engaged in the activities of learners in ways that are fully accessible to them. This is achieved via ASL

and within social contexts of the culture of ASL users (Singleton & Morgan, 2004). Otherwise, in these classrooms, the possibility of achieving a rich social environment of child-to-child and child-to-adult engagement is very unlikely. The emphasis is on the teacher as a model of language (English), speech, and learning. Since the teachers in these classrooms are often hearing and vary in signing ability from none to slightly fluent English-signers, these classrooms are effectively monolingual as far as instruction is concerned (Andrews & Franklin, 1997; Andrews & Jordan, 1993). If the children in the classroom are interacting in sign despite the teacher's inability to participate, then child-to-child activity goes ignored or unvalued. It is often seen as off-task behavior.

Achieving robust and frequent peer interactions, social development, social learning, and a rich linguistic community is critical. When this is achieved, children are engaged in joint activity that builds community and builds knowledge. The teacher is not the only resource. The paradigm shift from traditional deaf education to a bilingual approach of schooling in ASL has implications for how we think of the teacher.

The Teacher in School in ASL

To work in school in ASL, a teacher of deaf children would ideally be fluent in ASL, fluent in the English language, be Deaf, or, if not Deaf, very well acculturated into the culture of the Deaf community. Many Deaf teachers, while not masters of English speech, are fluent in the English language, including its printed form. And many hearing teachers, while not possessing native fluency in ASL, often attain high levels of fluency in ASL.

In attempting to maintain control, teachers who have poor engagement with their students because of limited ASL fluency often reduce learning opportunities (Mather, 1990; Singleton & Morgan, 2004). Teachers who are, conversely, fluent in ASL and experienced in interacting with deaf people of all ages are able to maintain control and engagement of students in multilanguage, child-centered activity. But teachers need training beyond language fluency. The goal is to train teachers to organize activity so that one language, ASL, can mediate not just subject matter content but also another language, English, and English print. These central concepts of how to do school in ASL connect to well-established practices common in bilingual education such as language transfer (Cummins, 1981); language learning across the curriculum (and academic language development) (Chamot & O'Malley, 1994); the promotion of metacognitive and metalinguistic skills (Cazden, 1974; Zhang, 2001); learning as a community (collaboration and cooperation) through peer interaction; and intrinsic motivation (Lee & Smagorinsky, 2000; Schul, 2011).

In schooling in ASL, languages are constantly in interaction (Allen, 1998). While the two primary languages may be ASL and English, other languages may be involved. Regardless, each language is given its own place, space, context, and time. This approach to deaf education presents the challenge of making connections between languages and across languages so that children are not confused. Confusion of one language for another is a real issue in classrooms where ASL signs are mapped on English word order and a sign is used to represent one or more English words that don't mean the same thing (for example, using the sign for RUN to represent the English 'run' [move fast] and also the English 'run' [campaign for office] and/or 'run' [a flaw in a stocking]).

Faculty and student teachers at UCSD have often found deaf children to be confused about the relationship between ASL and English, even in upper grades. For example, students state that English is for the classroom and ASL is for the playground (even when ASL appears in both sites). These same students often write English sentences in ASL grammar. Furthermore, when asked to "read aloud" an English text in ASL, frequently, students sign the text in English grammar with semantic inaccuracies rather than translating into accurate ASL (Allen, 1998). There is a tendency for signs to be made up by teachers when they try to achieve equivalents between ASL and English in ways that don't protect the meaning of either language. One vivid example we observed was an invented sign for "volcano erupting." The ASL sign would involve using a classifier for a "flashing or emitting state" on the right hand as it repeatedly passed through a cylinder shape on the left hand. The made up sign involved the same left hand with cylinder shape but changed the right hand to a V shape, like V for Victory. The resulting made up sign, which appears to be a V springing out of a cylinder has no meaning associated with the eruption of a volcano and even experienced ASL signers would have to guess at its meaning (Humphries & MacDougall, 2000).

Because of the interplay of two (or more) languages, it is important for teachers to recognize and plan for the development of students' facility of going in and out of languages, particularly among younger deaf students in lower grades. The goal is for students to become facile in recognizing the two languages and where and when to situate them. Keeping ASL and English separate while successfully juxtaposing them at the same time requires fluent teachers' (Deaf or hearing) intuitiveness about both languages and careful planning of language activities.

What about speech and listening skills in English when doing schooling in ASL? Even in schooling in ASL (as is true in English-only approaches), parents and students themselves will often want to pursue speech and auditory training along with reading and writing English. Teaching speech and listening skills in schooling in ASL are as possible as in any pedagogy. Because of the strong correlation between ASL fluency and the development of English language proficiency and English literacy (Hoffmeister et al., 1998; Padden & Ramsey, 1998; Prinz & Strong, 1998), an argument can be made that the development of speaking and listening skills in English is more enhanced with schooling in ASL than with traditional English-only instruction. Speaking and listening comprehension are so closely related to language proficiency that it seems illogical to believe that schooling in ASL, where the link between ASL fluency and English literacy has been established, would be anything but a productive environment for speech development and comprehension. Knowing the language is certainly a prerequisite for learning to speak or hear it.

Positioning speech and listening in schooling in ASL requires, however, a change in how we have contextualized speech and listening within educational planning. It requires an embedding of speech, lip-reading, and listening skills into signing contexts and not in separate English-only contexts that do not reflect reality for signing Deaf people. This does not mean the combining of speaking and signing into a practice known as simultaneous communication (speaking and signing at the same time in English word order). Rather, it is the recognition of contexts in which speech and signing are used separately as well as those situations in which they might appear together, alternating or

simultaneously. For example, during story reading, the options would be to read the story aloud in English to those students who are learning to listen to English, to sign in ASL to those students who are learning ASL (or are not, by design, learning to listen), or even to sign and speak at the same time if the context seems to determine that. The differentiation of student goals and lesson design places both signing and speaking into the context of school in ASL where other languages can be treated as primary when the need or situation dictates but does not take the activity or the student out of the context of school in ASL. Shifting in and out of language-use contexts is a skill and lifelong practice that Deaf people now develop mostly on their own. As discussed earlier, teachers need to know how to plan for the development of this skill. Such planning and organizing of learning activities that present opportunities to use English in its various forms should be a regularized part of the pedagogy of schooling in ASL.

Child-centered speech instruction, rather than teacher-centered speech therapy, would be one of the ways that schooling in ASL reconceptualizes the place of speech development in deaf education. In teacher-centered speech instruction, the student is pulled from the classroom for sessions with therapists or works in small groups on activities where the teacher directs students to listen and to speak, and invariably provides feedback and correction. Tasks are organized in such a way as to center the interaction between the student and the teacher rather than between students. Often, other students who are themselves learning to speak and listen are assumed to not be good speaking models or not be able to provide good feedback to their peers. The interaction is a controlled one between teacher and student. On the other hand, student-centered speech instruction does not require a separation of the student from the normal activity of the classroom. It requires planning by the teacher to create activities for students that involve speaking and listening. These activities can be both separate activities of selected groups of students or whole group activities in which when English appears, speech also appears in context (speakers may be teachers, aides, students, therapists, whoever can join the activity).

Schooling in ASL, however, does require something quite innovative and potentially refreshing. It requires that Deaf teachers plan for speech and listening development in their classrooms, if the parents and students request it. Traditionally, speech has belonged to hearing people, hearing educators or hearing professionals. In schooling in ASL, Deaf people's—including Deaf teachers'—own speech and teaching practices reflect this new relationship. Deaf teachers can plan, organize, and coordinate activities that promote speech and listening development. These activities can be then carried out in various ways, mentioned above.

And finally, schooling in ASL requires a change in our ideas about what is assessed in determining students' development and academic progress. Because schooling in ASL emphasizes ASL and English development as well as content knowledge, teachers must track ASL and ASL literacy development as well as English development. Assessment of bi-literacy is central to the teacher's monitoring of the students' progress and planning for learning. Teachers need to master assessment instruments that allow for assessment of multilanguage development in different modalities, signed or spoken. An example of such an assessment that we have used for training purposes is the Learning Record which involves, among other things, the gathering of evidence to track emergent development of

language, literacy, and communication (Barr, Craig, Fisette, & Syverson, 1999; Humphries & Allen, 2008).

Above all is the visual nature of deaf people's lives as discussed earlier. Deaf children who learn English from their Deaf parents show us that hearing is not necessary to learn English. Yet, we don't yet fully understand the nature of visual learning. But what we have learned about Deaf people's visual language (ASL) has caused us to rethink what we know about language and the human capacity for language. We now know that language exists in both spoken and sign modalities. The following suggests a model for preparing teachers of deaf children designed to emphasis visual language (ASL) and visual learning as well as the development of English literacy and academic skills in a bilingual approach.

Training Teachers for the ASL Authorization

This section describes the development, beginning in 1996, of an experimental program at the University of California, San Diego (UCSD) that resulted in a teacher preparation curriculum that closely integrated regular education and the specialty of deaf education. It specifically aimed to bring established bilingual pedagogical theory and practice to bear on deaf education (Humphries & Allen, 2008). The program design sought to incorporate recent research on visual learning and visual language, research showing a correlation between ASL fluency and English literacy, and new findings about Deaf bilingualism.

An Experimental Program

The program was proposed under California Commission on Teacher Credentialing (CCTC) guidelines for a category of experimental programs in effect at that time. It was approved and began to admit students in 1998. The curriculum allowed UCSD to recommend those who had completed the program for both the Multiple Subjects bilingual (BCLAD) and the Deaf and Hard-of-Hearing Specialist credentials. Subsequently, the program was included in a 2001 accreditation review by the CCTC and approved along with other credential programs at UCSD. Possibly because of the experimental program and its reliance on the most recent research linking ASL to English literacy among deaf children, the CCTC, in its recent move from the bilingual credential to bilingual authorization for the multiple subject credential, approved UCSD's application for an ASL authorization—an authorization that had not existed before.

We began designing the experimental program with the principle that bilingual fluency in ASL and English and cross training in deaf education, coupled with applicable practices derived from bilingual education, were essential for both pre-service and in-service teachers of deaf children. Our thesis, informed by research, was that this foundation provides teachers with an improved ability to communicate with their students and opportunities to design and implement assessment and learning strategies for diverse populations of deaf and hard-of-hearing students. Additionally, we believed this approach encourages bringing learning and literacy practices from the Deaf community, as well as the child's home community, into the school to aid learning and development. Examples of such practices have been observed in studies of Deaf mother–Deaf child interactions around two languages as well as Deaf parents' reading practices with their very young

Deaf children (Andrews & Taylor, 1987; Blumenthal-Kelly, 1995; Padden, 1991). These practices have also been observed with Deaf teachers engaging Deaf students in classroom activities (Humphries, 2004; Humphries & MacDougall, 2000; Singleton & Morgan, 2004).

Our approach represented a shift in paradigms—moving away from a pedagogy that assumes that deaf and hard-of-hearing children are deficient or developmentally abnormal to an understanding that these children are emerging language learners who require learning environments that are culturally and socially accessible. Because we had no established models to draw upon in the field of deaf education, we felt it necessary to put into place several important self-critical processes to help us shape the training curriculum, as well as to evaluate outcomes for pre-service teachers, in-service teachers, and their students. One such process was to establish feedback loops for constituencies—students, cooperative teachers, training faculty, and principals. This helped us to gauge the impact our approach would have on people "on the ground." Another process was to submit to rigorous self-inquiry about our own practice of training teachers using this new curriculum. This internal discussion and adjustment resulted in some important changes to the initial curriculum, the most significant of which was to expand student teaching time from 15 weeks to 25 weeks to allow for more maturation for teachers learning two practices—bilingual practice and deaf education practice. Yet another process was to conduct a collaborative project with our pre-service teachers, in-service teachers in the local schools, and assessment specialists to measure some of the impact of the training on teachers, classrooms, and students (Humphries & Allen, 2008). This collaboration also had the added benefit of informing deaf education personnel in local schools more thoroughly about bilingual education and what we were attempting to do.

Our attempt to shift to a new practice raised several issues and solutions for action research. For example, the question of the sustainability of new practices was a concern. At a time when deaf education programs were closing across the country due to low enrollment and budget cuts (Illinois has had four programs close recently and California two), how could we design a program that was not vulnerable to closure in a stressed economic environment? This question led to a critical decision to design the deaf education program as a fully integrated part of an existing regular education BCLAD program rather than as a stand alone deaf education program, as is done in so many universities. Integrating the program in this way allowed for the sharing of faculty resources and time, eliminated the need for another administrative structure, combined staff advising, avoided course duplication, and supported other practices that help to alleviate the effects of cost saving measures.

Other concerns arose were related to (a) how school personnel, who were used to seeing a more traditional specialist preparation program, would view the new type of training that our pre-service teachers received; (b) what would constitute evidence that the training was indeed migrating into the culture of practice in local classrooms; and (c) how we could measure the impact of a new set of teaching practices when graduates of the training program were distributed widely rather than concentrated in one school. These issues have been considerations in our ongoing efforts to refine training of teachers with new sets of skills and knowledge to work with deaf and hard-of-hearing children.

Program Structure and Design

The program requires two years of study. The first year focuses on completion of requirements for the two credentials, and the second year emphasizes curriculum research and thesis preparation, as well as additional student teaching experience. The cumulating exam involves a thesis on development of new curricula using bilingual pedagogy and learning strategies.

The typical teacher preparation program today does not require fluency in ASL prior to admission to a typical one- or two-year training program. However, many programs require a standard of fluency at graduation. Teacher trainees who are not already fluent in ASL upon entering such programs have difficulty achieving fluency in the length of time they are enrolled in most of these programs. Many teachers thus go into the classroom unprepared to understand their students or make themselves understood if signing is involved. For this reason, we require ASL fluency at the time of admission.

In addition to being bilingual, teachers must be able to recognize and respond to all forms of language variation that may be present in an urban classroom. They need to be able to accommodate signing and non-signing deaf and hard-of-hearing children when these children come into their classrooms. Teachers must be able to help these children develop fluency in ASL and English as necessary. We also need teachers who are fluent in other languages or are ready to work with the other languages of deaf and hard-of-hearing children. For example, there are too few teachers of deaf and hard-of-hearing children who are fluent in Spanish or Mexican Sign Language. Since we cannot prepare teachers for every variation they might encounter, it is important that they be fluent in at least two of the languages (ASL and English) that are vital to membership in an English-speaking and ASL-signing U.S. community and are trained in bilingual education.

The training has the following content focuses:

- The child's development is in two or more languages, and instruction is provided in at least two languages;
- Connections are made between the languages as they interact (e.g., ASL is engaged in promoting English acquisition);
- Literacy in the languages is organized around both Deaf and hearing cultural contexts and the contexts of home and school;
- The social resources of all of the involved communities (e.g., Deaf and hearing communities, Spanish-speaking communities) are brought to bear on the children's ability to manipulate symbols, learn human language, use language as a means of reflection, and take conscious control of their own learning and literacy;
- And developmentally reasonable teaching strategies are used for introducing both language and curriculum content to children.

The training curriculum was designed to produce teachers who can make critical evaluations of and selections from both bilingual and deaf education methodology for teaching deaf and hard-of-hearing children. A direct transfer of theory and practice of bilingual education pedagogy to deaf and hard-of-hearing instruction is not necessarily achievable. Teachers need training in how to recognize points of departure between

Spanish/English pedagogy, for example, and ASL/English pedagogy. Also, deaf learners' home and community situations are often different from other minority cultures. For one thing, they may not even have access to a heritage language if their parents do not sign, and they are unable to access spoken English. Teachers must be able to critically analyze, select, adapt, or redesign curriculum practices that will help children make connections between the varieties of language used at home, in the community, and at school. Teachers also need to design curriculum practices that assist children in developing the versatility in communication that they will need to successfully function in these multicultural situations.

The design of the training curriculum is quite extensive. After completing several foundation courses, either as an undergraduate or in a summer intensive program, the first year of study focuses on methods and practice in two areas. While joining all other Multiple Subject students training for the bilingual authorization in other languages (Spanish, Vietnamese, etc.), the ASL students also take a parallel set of courses that prepares them for teaching deaf and hard-of-hearing students, but more importantly, trains them in the adaptation and translation of bilingual education practices for application with deaf and hard-of-hearing students. Teachers take courses in two sets of practices that are constantly related to one another. It is in these parallel classes that students are engaged in training and discussion of strategies and design for visual learning and use of visual language.

During this first year, students engage in student teaching for increasingly longer periods of time in classrooms with deaf and hard-of-hearing children. Their practicum courses require that they experience at least two and possibly three different classroom placements to experience the diversity of deaf children in local public schools and educational settings for deaf children.

Since this is a research-based training program and the emphasis is on training the teacher as researcher, several second-year courses address current research and its application. While in these courses, students apply current research to innovative curriculum development. They design and write a curriculum incorporating bilingual practices, visual learning, and technology; field test it during student teaching in a classroom; and write a thesis documenting and evaluating the curriculum. In this way, students participate in developing a new set of classroom practices and activities that are tested and refined.

Conclusion

Our experience and research on this training model tells us that we need to add new dimensions to our training and that there are yet more competencies that deaf and hard-of-hearing specialists need to have in the modern classroom. New research (discussed earlier) in visual learning has reinforced and added to our theoretical basis for this approach and has suggested the critical importance of visual learning and visual language for deaf and hard-of-hearing children. Yet, much of this research remains untranslated into classroom use.

The demands on teachers in any classroom to perform expert assessment of children from varying language backgrounds suggest to us that newer visual technologies can be more helpful to teachers in performing literacy assessments. We need to innovate and

evaluate new applications of these technologies for assessment purposes. Teachers skilled in accessing, preparing, and generating documentation and evidence of language and literacy development can make far better decisions about "next steps."

With ASL as an important component to teaching and learning, the ability to record and manipulate this unwritten language using visual technologies is an exciting new field of innovation. An example is the use of touch screens to allow students to touch English words on the screen and get instant ASL translations. Such innovations motivate a need to prepare teachers to be skilled in the use of digital technology as a natural component of their teaching repertoire in classrooms of deaf and hard-of-hearing children. Every new generation of deaf children now is coming into a world where deaf people are engaging with English in unprecedented ways through email, texting, social networking, e-books, closed captioning, and other forms. The use of these new technologies is highly motivating to students if teachers have the skills and knowledge to create classroom activities around them.

The initial experimental program has already had an impact on the field of deaf education. This is evidenced by the significant funding provided over the past eight years by the U.S. Department of Education for financial aid for students in the UCSD program. This funding (and the peer review it involves) is recognition of the value of this effort to the development of new practices in the education of deaf and hard-of-hearing children. The application of bilingual education practice to deaf and hard-of-hearing students is a departure from traditional deaf education and a challenge to the field to think outside older paradigms that have not yielded the success that we would want for deaf and hard-of-hearing children. Deaf people themselves have long held that signed language is essential in their education and our teacher preparation program is one of the few efforts that seek to provide evidence of that assumption. This type of training seeks to create a scientific basis and understanding of what we have known for many years—that Deaf children from Deaf families outperform deaf children from hearing families in academic and social development. We wish to institutionalize what Deaf people know about how Deaf people learn, a question that the profession has not asked itself enough and has not tried to turn into practice enough.

The program thus far has been an experiment in the transformation of social context of education. This program shifts our thinking of the "teacher of the deaf" from the traditional construction as a special education teacher, a specialist, who intervenes and tries to remedy the deficit of the deaf child to a bilingual teacher, who works across modalities (a visual language, ASL, and a spoken one, English) and with language learners in an environment of emergent literacy. We have and will learn much from this program about the social construction of both pedagogy and "the teacher." In this transformed social context, we have an opportunity to see if it is traditional pedagogy that is responsible for the lack of success among deaf and hard-of-hearing children and if another pedagogy might lead to more success and perhaps achieve a measure of social justice for deaf people and their language. We believe this effort goes well beyond deaf and hard-of-hearing children and can provide insights into the possible transformation of the social contexts in which we couch pedagogy for many other underachieving children.

References

Allen, B. (1998). *Bilingual-bicultural early childhood classroom: Deaf children and the families' perspectives* (Unpublished doctoral dissertation). Claremont Graduate School, Claremont, CA.

Anderson, D., & Reilly, J. (2002). The MacArthur communicative development inventory: Normative data for American Sign Language. *Journal of Deaf Studies and Deaf Education, 7*(2), 83-119. doi:10.1093/deafed/7.2.83

Andrews, J., & Franklin, T. C. (1997). Why hire Deaf teachers? *Texas Journal of Speech and Hearing, XXII*(1), 120-131.

Andrews, J., & Jordan, D. (1993). Minority and minority-deaf professionals: How many and where are they? *American Annals of the Deaf, 138*(5), 388-396. doi:10.1353/aad.2012.0340

Andrews, J., & Taylor, N. (1987). From sign to print: Picture book "reading" between mother and child. *Sign Language Studies, 56*, 261-274.

Baker, C., & Battison, R. (Eds.). (1980). *Sign language and the Deaf community*. Silver Spring, MD: National Association of the Deaf.

Barr, M., Craig, D., Fisette, D., & Syverson, M. (1999). *Assessing literacy with the learning record: A handbook for teachers, grades K-6*. Portsmouth, NH: Heinemann.

Battison, R. (1978). *Lexical borrowing in American Sign Language*. Silver Spring, MD: Linstok Press.

Bauman, D., & Murray, J. (2010). Deaf studies in the 21st century: "Deaf-gain" and the future of human diversity. In M. Marschark & P. Spencer (Eds.), *The Oxford Handbook of Deaf Studies, Language, and Education* (pp. 210-225). New York, NY: Oxford University Press.

Baynton, D. C. (1996). *Forbidden signs: American culture and the campaign against sign language*. Chicago, IL: University of Chicago Press.

Bellugi, U., Klima, E., & Siple, P. (1975). Remembering in signs. *Cognition, 3*, 93-125. doi:10.1016/0010-0277(74)90015-8

Bellugi, U., & Studdert-Kennedy, M. (1980). *Signed and spoken language: Biological constraints on linguistic form*. Deerfield Beach, FL: Verlag Chemie.

Blumenthal-Kelly, A. (1995). Fingerspelling interaction: A set of Deaf parents and their Deaf daughter. In C. Lucas (Ed.), *Sociolinguistics in Deaf commuities* (p. 62-73). Washington, DC: Gallaudet University Press.

Cawthon, S. (2001). Teaching strategies in inclusive classrooms with Deaf students. *Journal of Deaf Studies and Deaf Education, 6*(3), 212-225. doi:10.1093/deafed/6.3.212

Cazden, C. (1974). Play and metalinguistic awareness: One dimension of language experience. *The Urban Review, 7*(1), 28-39. doi:10.1007/BF02223202

Chamot, A., & O'Malley, J. (1994). *The CALLA handbook: Implementing the cognitive academic language learning approach*. New York, NY: Longman.

Christensen, K., & Delgado, G. (1993). *Multicultural issues in deafness*. White Plains, NY: Longman.

Cohen, O. (Ed.). (1993). *Educational needs of African American and Hispanic Deaf children and youth*. White Plains, NY: Longman.

Cole, M., & Cole, S. (1993). *The development of children* (2nd ed.). New York, NY: Scientific American Books College Publishing.

Corona, D., & Singleton, J. (2009). Developmental social cognitive neuroscience: Insights from deafness. *Child Development, 80*(4), 952-967. doi:10.1111/j.1467-8624.2009.01310.x

Corson, H. (1973). *Comparing Deaf children of oral Deaf parents and Deaf parents using manual communication with Deaf children of hearing parents on academic, social, and communication functioning* (Unpublished doctoral disseration). University of Cincinnati, Cincinnati, OH.

Coye, T., Humphries, T., & Martin, B. (1978). *A bilingual approach to teaching English.* Paper presented at the National Symposium on Sign Language Research and Teaching, San Diego, CA.

Crume, P., & Singleton, J. (2008). *Teacher practices for promoting visual engagement of Deaf children in a bilingual school*. Paper presented at the Association of College Educators of the Deaf/Hard of Hearing, Monterey, CA.

Cummins, J. (1979). Linguistic interdependence and the educational development of bilingual children. *Reveiw of Educational Research, 49*(2), 222-251.

Cummins, J. (1981). The role of primary language development in romoting educational succss for langauge minority students. In California State Department of Education (Ed.), *Schooling and minority Students: A theoretical framework* (pp. 3-49). Los Angeles, CA: National Dissemination and Assessment Center.

Cummins, J. (2006). The relationship between American Sign Language proficiency and English academic development: A review of the research. *Resources for Mainstream Programs*. Retrieved from http://clerccenter.gallaudet.edu/Documents/Cummins_ASL-Eng.pdf

Dyson, A. (1993). *Social worlds of children learning to write*. New York, NY: Teachers College Press.

Fernald, A. (2008). Looking while listening: Using eye movements to monitor spoken language comprehension by infants and young chldren. In I. Sekerina, E. Fernandez, & H. Clahsen (Eds.), *Developmental Psycholinguistics: On-line methods in children's language processing* (p. 97-135). Philadelphia, PA: John Benjamins B.V.

Furth, H. (1966). *Thinking without langauge: Psychological implications of deafness*. New York, NY: The Free Press.

Gallaudet Research Institute. (2011). *Regional and national summary report of data from the 2001-2002 annual survey of deaf and hard-of-hearing children and youth*. Washington, DC: Galludet Research Institute, Gallaudet University.

Gee, J., & Goodhart, W. (1985). Nativization, linguistic theory, and Deaf language acquisition. *Sign Language Studies*(49), 291-342.

Gerner de Garcia, B. (1993). Addressing the needs of Hispanic Deaf children. In K. Christensen & G. Delgado (Eds.), *Multicultural issues in deafness* (p. 69-90). White Plains, NY: Longman.

Grosjean, F. (1992). Another view of bilingualism. In R. Harris (Ed.), *Cognitive processing in bilinguals* (p. 51-62). New York, NY: Elsevier Science Pub.

Grosjean, F. (2001). The right of the Deaf child to grow up bilingual. *Sign Language Studies, 1*(2), 110-114. doi:10.1353/sls.2001.0003

Grosjean, F. (2010). Bilingualism, biculturalism, and deafness. *International Journal of Bilingual Eduation and Bilingualism, 13*(2), 133-145. doi:10.1080/13670050903474051

Hairston, E., & Smith, L. (1983). *Black and Deaf in America: Are we that different?* Silver Spring, MD: TJ Publishers, Inc.

Harris, M., & Chasin, J. (2005). Visual attention in deaf and hearing infants: The role of auditory cues. *Journal of Child Psychology and Psychiatry, 46*(10), 1116-1123. doi.10.1111/j.1469-7610.2005.00405.x

Hoffmeister, R., de Villiers, P., Engen, E., & Topol, D. (1998). *English reading achievement and ASL skills in Deaf students.* Paper presented at the The 21st annual Boston University conference on language development, Brookline, MA.

Humphries, T. (1993). Deaf culture and cultures. In K. Christensen & G. Delgado (Eds.), *Multicultural issues in deafness*. New York, NY: Longman.

Humphries, T. (2004). The modern Deaf self: Indigenous practices and educational imperatives. In B. Bruggeman (Ed.), *Literacy and Deaf people: Cultural and contextual perspectives*. Washington, DC: Gallaudet University Press.

Humphries, T. (2012). *Schooling in ASL*. Unpublished manuscript, Department of Communication, University of California, San Diego, San Diego, CA.

Humphries, T., & Allen, B. (2008). Re-organizing teacher preparation in deaf education. *Sign Language Studies, 8*(2), 160-180. doi:10.1353/sls.2008.0000

Humphries, T., Kushalnagar, P., Mathur, G., Napoli, D., Padden, C., Rathmann, C., & Smith, S. (2012). Cochlear implants and the right to language: Ethical considerations, the ideal situation, and practical measures toward reaching the ideal. In C. Umat & T. Rinze (Eds.), *Cochlear Impant Research Updates*. Retrieved from http://www.intechopen.com/books/cochlear-implant-research-updates

Humphries, T., & MacDougall, F. (2000). "Chaining" and other links: Making connections between American Sign Language and English in two types of school settings. *Visual Anthropology Review, 15*(2), 84-94. doi:10.1525/var.2000.15.2.84

Humphries, T., Padden, C., & O'Rourke, T. J. (1980). *A basic course in American Sign Language*. Silver Spring, MD: T.J. Publishers.

Jacobs, L. (1980). *A Deaf adult speaks out* (2nd ed.). Washington, DC: Gallaudet College Press.

Johnson, R., Liddell, S., & Erting, C. (1989). *Unlocking the curriculum*. Washington, DC: Gallaudet University Research Institute.

Kannapell, B. (1974). Bilingualism: A new direction in the education of the Deaf. *The Deaf American*, 9-15.

Klima, E. S., & Bellugi, U. (1979). *The signs of language*. Cambridge, MA: Harvard University Press.

Krashen, S. (1985). *The input hypothesis*. New York, NY: Longman.

Lane, H. (1992). *The mask of benevolence: Disabling the Deaf community*. New York, NY: Alfred A. Knopf.

Lane, H. (2011). *The people of the eye: Deaf ethnicity and ancestry*. New York, NY: Oxford University Press.

Lane, H., Hoffmeister, R., & Bahan, B. (1996). *A journey into the Deaf world*. San Diego, CA: Dawn Sign Press.

Lee, C. D., & Smagorinsky, P. (2000). *Vygotskian perspectives on literacy research: Constructing meaning through collaborative inquiry*. New York, NY: Cambridge University Press.

Lieberman, A. (2008). *Attention-getting strategies of Deaf children using ASL in a preschool classroom*. Paper presented at the Boston University Conference on Language Development, Boston, MA.

Lieberman, A., Hatrak, M., & Mayberry, R. (2011). *The development of eye gaze control in Deaf children.* Paper presented at the Boston Uiversity Conference on Language Development, Boston, MA.

Mahshie, S. N. (1995). *Educating Deaf children bilingually: With insights and applications from Sweden and Denmark*. Washington, DC: Pre-College Programs Gallaudet University.

Markowicz, H., & Woodward, J. (1975). *Language and the maintenance of ethnic boundaries in the Deaf community*. Paper presented at the Conference on Culture and Communication, Philadelphia, PA.

Mather, S. (1990). Home and classroom communication. In D. Moores & K. Meadow-Orlans (Eds.), *Research in educational and developmental aspects of deafness* (p. 232-254). Washington, DC: Gallaudet University Press.

May, S. (Ed.). (1999). *Indigenous community-based education*. Philadelphia, PA: Multilingual Matters, Ltd.

Mayberry, R., del Giudice, A. A., & Lieberman, A. (2011). Reading achievement in relation to phoological coding and awareness in Deaf readers: A meta-analysis. *Journal of Deaf Studies and Deaf Education, 16*(2), 164-188. doi:10.1093/deafed/enq049

McIntire, M. (1977). The acquisition of American Sign Language hand configurations. *Sign Language Studies, 16*, 247-266.

Meadow, K. (1968). Early manual communication in relation to the Deaf child's intellectual, social, and communicative functioning. *American Annals of the Deaf, 113*, 29-41.

Moll, L., Amanti, C., Neff, D., & Gonzalez, N. (1992). Funds of knowledge for teaching: Using a qualitative approach to connect homes and classrooms. *Theory Into Practice, XXXI*(2), 132-141. doi:10.1080/00405849209543534

Myklebust, H. (1960). *Psychology of deafness*. New York, NY: Grune and Stratton.

National Association of the Deaf. (2008). *Postion statement on American Sign Language.* Retrieved from http://www.nad.org/issues/american-sign-language/position-statement-american-sign-language-2008

Newport, E., & Meier, R. (1985). The acquisition of American Sign Language. In D. Slobin (Ed.), *The cross-linguistic study of language acquisition* (pp. 881-938). Hillsdale, NJ: Erlbaum.

Nover, S., & Andrews, J. (1998). *Critical pedagogy in deaf education: Bilingual methodology and staff development: Year 1 (1997-1998)*. USDLC Star Schools Project Report No. 1. New Mexico School for the Deaf, Santa Fe, NM.

O'Connell, J. (2007). Closing the achivement gap for students who are deaf or hard of hearing. *State of Education Address*. Retrieved from: http://www.cde.ca.gov/eo/inse/agdeaf.asp.

Padden, C. (1986). American Sign Language. *Encyclopedia of Deaf people and deafness*. NewYork: McGraw Hill.

Padden, C. (1988). *Interaction of morphology and syntax in American Sign Language*. New York, NY: Garland Press.

Padden, C. (1991). The acquisition of fingerspelling by Deaf children. In P. Siple & S. Fischer (Eds.), *Theoretical issues in sign language research* (Vol. 2, pp. 191-210). Chicago, IL: University of Chicago Press.

Padden, C., & Humphries, T. (1988). *Deaf in America: Voices from a culture*. Cambridge, MA: Harvard University Press.

Padden, C., & Humphries, T. (2005). *Inside Deaf culture*. Cambridge, MA: Harvard University Press.

Padden, C., & Markowicz, H. (1975, March). *Crossing cultural boundaries into the Deaf community*. Paper presented at the 1975 Conference on Culture and Communication, Philadelphia, PA.

Padden, C., & Markowicz, H. (1976). *Cultural conflicts between hearing and Deaf communities*. Paper presented at the Proceedings of the VII World Congress of the World Federation of the Deaf, Washington, DC.

Padden, C., & Ramsey, C. (1998). Reading ability in signing Deaf children. *Topics in Language Disorders, 18*, 30-46. doi:10.1097/00011363-199818080-00005

Petitto, L. (1985). Are sign languages acquired earlier than spoken languages? *Society for Research in Child Development Abstracts, Volume 5*. Biennial Meeting, Toronto, Canada.

Prinz, P., & Strong, M. (1998). ASL proficiency and English literacy within a bilingual Deaf education model of instruction. *Topics in Language Disorders, 18*, 47-60. doi:10.1097/00011363-199818040-00006

Reagan, T. (2004). *Non-western educational traditions*. New York, NY: Francis & Taylor, Inc.

Schick, B., de Villiers, P., de Villiers, J., & Hoffmeister, R. (2007). Language and theory of mind: A study of Deaf children. *Child Development, 78*(2), 376-396. doi:10.1111/j.1467-8624.2007.01004.x

Schul, J. E. (2011). Revisiting an old friend: The practice and promise of cooperative learning for the 21st century. *The Social Studies, 102*, 88-93. doi:10.1080/00377996.2010.509370

Singleton, J., & Morgan, D. (2004). Natural sign language acquisition within the social context of the classroom. In B. Shick, M. Marshchark, & P. Spencer (Eds.), *Advances in sign language development by Deaf children* (pp. 344-375). New York, NY: Oxford University Press.

Siple, P. (Ed.). (1978). *Understanding language through sign language research*. New York, NY: Academic Press.

Stokoe, W., Croneberg, C., & Casterline, D. (1965). *A dictionary of American Sign Language on linguistic principles*. Washington, DC: Gallaudet College Press.

Stone, P. (1999). *Revolutionizing language instruction in oral Deaf education*. Paper presented at the Proceedings of the 14th International Congress of Phonetic Sciences, San Francisco, CA.

Stuckless, R., & Birch, J. (1966). The influence of early manual comunication on the linguistic development of Deaf children. *American Annals of the Deaf, 10*(6), 436-480.

Supalla, T. (1985). The classifier system in American Sign Language. In C. Craig (Ed.), *Noun classification and categorization* (pp. 181-214). Philadelphia, PA: John Benjamins B.V.

Supalla, T., & Newport, E. (1978). How many seats in a chair? The derivation of nouns and verbs in American Sign Language. In P. Siple (Ed.), *Understanding language through Sign Language Research* (pp. 91-132). New York, NY: Academic Press.

Vasquez, O., Pease-Alvarez, P., & Shannon, S. M. (1994). *Pushing boundaries: Language in a Mexicano community*. New York, NY: Cambridge University Press.

Vygotsky, L. (1985). *Thought and language*. Cambridge, MA: MIT Press.

Walworth, M. (Ed.). (1990). *Teaching English to Deaf and second-language students* (Vol. 8). Washington, DC: Gallaudet University.

Waxman, R., & Spencer, P. (1997). What mothers do to support infant visual attention: Sensitivities to age and hearing status. *Journal of Deaf Studies and Deaf Education, 2*(2), 104-114. doi:10.1093/oxfordjournals.deafed.a014311

Wertsch, J. (1989). A sociocultural approach to mind: Some theoretical considerations. *Sociocultural approaches to mind: Cultural Processes, 2*, 140-161.

Wink, J. (2000). *Critical pedagogy: Notes from the real world*. New York, NY: Addison Wesley Longman.

Woodward, J. C. (1982). *How you gonna get to heaven if you can't talk with Jesus: On de-pathologizing deafness*. Silver Spring, MD: TJ Publishers.

Zhang, L. J. (2001). Awareness in reading: EFL students' metacognitive knowledge of reading strategies in an input-poor environment. *Language Awareness, 11*(4), 268-288. doi:10.1080/09658410108667039