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Using sign language with hearing preschool children

Abstract

The purposed of this review is to examine the effects of using American Sign Language (ASL) with hearing preschool children without disabilities. The research examined the effects on cognitive skills, fine motor skills, IQ, student behavior, and memory when American Sign Language is implemented into a preschool classroom. A variety of sources were examined and synthesized to provide the reader with informational data and recommendations.

Using Sign Language with Hearing Preschool Children

A Graduate Review

Submitted to the

Division of Early Childhood Education

Department of Curriculum and Instruction

In Partial Fulfillment

Of the Requirements for the Degree

Master of Arts in Education

UNIVERSITY OF NORTHERN IOWA

By

Jamie E. Johnson

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This Review by: Jamie E. Johnson

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The purposed of this review is to examine the effects of using American Sign Language (ASL) with hearing preschool children without disabilities. The research examined the effects on cognitive skills, fine motor skills, IQ, student behavior, and memory when American Sign Language is implemented into a preschool classroom. A variety of sources were examined and synthesized to provide the reader with informational data and recommendations.

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CHAPTER ONE

Introduction

Expectations in academic areas, particularly literacy, have increased. For example, students are now expected to know some alphabet letters, colors, shapes, and numbers when arriving for kindergarten. Students who start kindergarten with minimal knowledge of letters, colors, or shapes are likely to be labeled *at risk*. With the increase in expectations, preschool students will need more assistance in reaching goals. Preschoolers need to have skills for reading readiness as well as social skills to be successful in their school-aged career.

There are several tools that are helpful in providing assistance to children in preschool classrooms. Visual aids such as posters, signs, drawings, art work, and reminders around the room are commonly used by teachers as tools for students. Visuals help students remember stories, jobs, and academics. Felt pieces, magnet pieces and puppets have been used for decades to help young children remember the main ideas in stories, nursery rhymes, and chants. Pictures are posted all around classrooms to help preschoolers remember simple three step instructions (i.e., wash hands, dry hands, turn off water). Some curricula have embedded pictures into their alphabet letters to help students remember and associate letters such as *Alpha Friends* (Houghton-Mifflin, 2007), *AlphaTales* (Scholastic, 2009), and *Handwriting without Tears* (Handwriting without Tears, 2008). When students are being assessed, many times they will look around the room for pictures to cue their memory. Sign language is another way to provide preschool students with visual cues. With sign language students aren't forced to search

for answers from the visual cues provided around the room. Students are provided with support directly in their own hands.

Rationale

Sign language has been used to promote language development, improve reading skills, maintain behavior control, foster self-esteem, and increase positive classroom management (Feekes, Good, & Shawd, 1993). Preschool teachers may increase some students' development by incorporating and encouraging the use of sign language in day-to-day transactions.

Purpose of Review Results

The purpose of this review was to identify a research-based body of literature about the effects of using sign language in early childhood programs. The research that has been conducted on using sign language with hearing children in preschool classrooms has shown growth in language development, reading skills, behavior control, self esteem, enthusiasm, and involvement in activities (Chang & Larson, 2007). Students who were in classrooms where both sign and oral language were used demonstrated an increase in language development (Ohna, 2005).

Importance of Review

Iowa is beginning to implement a statewide voluntary preschool program for four-year-olds. This preschool program will be "...staffed with licensed teachers and working in tandem with individual communities, the program is a springboard to a child's early education success" (Iowa Department of Education, 2008, ¶ 1). Preschool programs will soon have set benchmarks similar to those used in a K-12 curriculum. Many preschools currently align their curriculum with the Iowa Early Learning Standards (Iowa

Department of Education, 2008, ¶ 19). These standards are a broad spectrum of skills and knowledge that children should achieve to be successful in kindergarten. With kindergarten standards rising preschool standards will eventually become more and more specific. Four year old students will most likely experience higher expectations in preschool classrooms to prepare them for kindergarten. In any setting it seems important for people to be familiar and comfortable with the environment in order to meet expectations. Sign language could give four year olds the cues needed throughout the day to be successful in transitions and routines. Many of the transitions and routines occurring in preschool carry over to kindergarten; providing students with a head start on routines with visual guidance in sign language could promote more success with the expectations and higher standards.

Sign language may facilitate development in language and in communication. Language development is a critical component of the early childhood years. Brain research has suggested that sign language engages the same region of the brain that oral language does (Rawlinson, 2006). This suggests that using sign language with oral language may enrich language development. Some four year olds struggle with communication because of speech delays. These students sometimes have trouble fitting in with classmates and may also exhibit behavior problems. When children cannot communicate their wants and needs, they can become frustrated and may begin to display negative behaviors such as hitting to convey their feelings in the classroom. Signing may provide a more positive means of communication for these children.

Research suggested that babies who use sign language while learning to speak have more intellectual development at an earlier age and develop at a faster rate than

those children who do not have sign language in the home (Acredolo & Goodwyn, 2000). There are still some children entering into preschool who are working very hard to learn how to speak and communicate expressively. The research by Acredolo and Goodwyn was with babies but also supports children who are learning to speak in general. When this growth and development is occurring in many preschool classrooms with children, the increase in intellectual development could potentially carry over.

Terminology

American Sign Language (ASL): a sign language for the deaf in which meaning is conveyed by a system of articulated hand gestures and their placement relative to the upper body (Merriam-Webster Online Dictionary, 2009, ¶ 2).

Attention Deficit Disorder (ADD): a syndrome of disordered learning and disruptive behavior that is not caused by any serious underlying physical or mental disorder and that has several subtypes characterized primarily by symptoms of inattentiveness or primarily by symptoms of hyperactivity and impulsive behavior (as speaking out of turn) or by the significant expression of all three (Merriam-Webster Online Dictionary, 2009, ¶ 2).

Baby Sign: Many parents use a collection of simplified signs called *baby sign*, as infants do not have the dexterity required for true ASL (Baby's sign to communicate, 2009, ¶ 2).

Behavior disorder (BD): problems such as a behavior inappropriate to the circumstances or pervasive unhappy moods that adversely affect a child's education performance and cannot be explained by intellectual, sensory, or health factors (Sternberg, 2006, p. 178).

Early childhood Education: teaching any child between the ages of 0 and 3rd grade.

Iconic Sign: Iconicity is the conceived similarity or analogy between a form of a sign (linguistic or otherwise) and its meaning (Babylon, 2007, ¶ 1). Iconic signs are signs that represent what they are conveying such as with the word *baby*. When signing baby one simply conveys “the natural gesture for holding a baby,” (American Sign Language browser, 1997, ¶ 1) making this similar to the word or iconic.

Learning Centers: A learning center is any freestanding, self-contained teaching-learning environment designed to direct and encourage a single student or a small group of students to use a variety of instructional media, to engage in diversified learning activities, and to assume major responsibility for his/her or their own learning (Hossain, 2008, ¶ 1).

Manipulatives: objects such as blocks, that a student is instructed to use in a way that teaches or reinforces a lesson (Merriam-Webster Online Dictionary, 2009, ¶ 2).

Sign: In this paper the word *sign* represents two meanings. It represents the actual motion of making a sign. It also is a shortened version of the words *sign language*.

Teachable moments: Times when the teacher can show or teach children about life’s little lessons. These are usually times within lesson plans when students point something out. Teachable moments are not planned but something that the teacher may want to point out and build on in the classroom.

Research Questions to be Answered

Many students entering preschool classrooms are entering into academics and social settings for their first time. Using sign language in preschool potentially may set up

some students, who would typically be *at-risk*, for success in later years. Students considered to be *average* or *above average* when entering preschool could also possibly rise above these labels and become models for other students, with the appropriate use of sign language in their early childhood classrooms. This paper's purpose is to explore the support for the use of sign language in preschool classrooms and to explore what is appropriate use of sign language in the classroom. To examine this purpose the following questions will be addressed:

1. What are the potential benefits of using sign language in the preschool classroom?
2. What are the problems of using sign language in the preschool classroom?
3. How could signing be implemented into the preschool curriculum?

CHAPTER TWO

Methodology

Researching the evidence supporting sign language was fascinating. The lack of research was very surprising. Research from the early 1980s was very supportive with a gap in research until the late 1990s and early 2000s. A great deal of the research from the 1980s was comparable to that of the 1990s. Updates needed to be made due to the lack of sign language use with hearing children occurring in the 1990s and 2000s. This chapter will discuss how sources were located, researched, analyzed, and organized.

Method to Locate Sources

At the onset of my search, I focused on the early studies about sign language use with young children, conducted in the 1980s. This led me to many summaries of short studies that have occurred more recently by some very popular sign language researchers. Later, I found journal articles using the ERIC search engine on the Rod Library homepage through the University of Northern Iowa. Other sources were located through the reference lists of helpful and informative articles that I had previously located. The reference lists of these articles proved to be very helpful and informative in my quest for research.

Some of the key words I used in conducting my searches included: *using sign language with special needs, using sign language with Attention Deficit Disorder (ADD), and using sign language with behavior disorders (BD), sign language in elementary, sign language in early childhood, and sign language in preschools*. Much of the research I located or identified was conducted on the use of sign language with non-hearing children. When studying the effects on non-hearing children, however, there were some

results concerning hearing children. This research became helpful in my review. There were a few studies included in my research that involved the effects of sign language on a special needs child. This research was included because the study was focused on a behavior due to a speech delay, which was not the special need of the child. Research related to special needs children and cognitive growth is not included in this review.

Many age levels of children are included in this review. The research that supports babies using sign language is used because many of the claims of positive results when teaching babies to speak align with preschoolers who are also learning to speak. There is also research included with kindergarten students and first grade students. Students in the longitudinal studies were also included in the research from the baby sign studies.

Research from the recent years including 1998-2009 is the main source of information in the review. In many of the reference lists of these studies, I found that older research from the early 1980s was the foundation behind the researchers' questions. I included some of this research to show that this idea is not a new idea; research has been conducted throughout the past 30 years about using sign language with hearing children.

Method to Select Sources

Research found included American Sign Language, Norwegian Sign Language, and a variety of baby sign language. There are many different types of baby sign language used in homes and in daycares. Data collected on students who previously used sign language of any type was included in the paper.

When I first began to look at data I did not want to include research on non-hearing students. After researching more and looking at statistics I did decide to use a limited amount of data including non-hearing children. The research that I decided to use involved the effects of sign language on development of the child or children.

There are several researchers, such as Acredolo and Goodwyn, Petitto and Holowka, and Daniels, who are well known for their knowledge and research in using sign language in early childhood education. After reading most of the work presented by these researchers, I also became familiar with the reference lists in their work. These authors listed in their research also became important to my research. Some of their work was easiest to find on an internet search engine such as Yahoo or Google.

Procedures to Analyze Sources

To analyze the literature that I selected, I wrote an annotated bibliography on each selection to identify the information that was related to my research questions.

Summarizing the articles and adding quotes that were supportive helped me narrow the information to the most important aspects. This made analysis of my information much easier and more interesting. Having my research organized in this manner allowed me to reread articles and add information, quotes, or statistics to the annotated bibliography for later use in my paper.

Articles were organized according to the type of sign language used, characteristics of the population in the study such as hearing or non-hearing, age, and whether the subjects were in a preschool or in a home setting. Research was also organized by the type of developmental increase the study suggested sign language may facilitate such as cognitive, memory, fine motor, or IQ score.

Criteria to Include Literature

Articles that I chose included research on children from the age of birth through eight. I wanted to include longitudinal research from adults who used sign language in their early childhood years. However, these types of longitudinal studies were difficult to locate. I did find a few that included data gathered over a year's time. I also found a completed longitudinal study involving data gathered at infancy and again at age eight. One study included, started within the last ten years and final data collection has not yet been conducted.

There is a broad spectrum of research when exploring the use and effects of sign language in the classroom. Finding information on hearing students was more difficult than that of non-hearing students. I did not plan to include data from the non-hearing community because sign language would be their native language and this research would not serve the purpose of my paper. However, I did use research from the non-hearing community that focused on the fine motor development of children, and I also included research that involved non-hearing parents with hearing children.

Most of the research in the review is qualitative but some research represents quantitative studies. More of the baby sign studies were quantitative, including large numbers of children to define and test the hypothesis with questionnaires. The studies with classrooms seem to be more qualitative by exploring different avenues of change with recorders, pictures and notes.

In the beginning I included as much recent research as I could find that included hearing children. As I found more research that applied to the questions I had in mind I began to exclude research that involved students using sign to learn sight words. I also

excluded research that included special needs children with the exception of one study that focused on the behavior of a special needs child.

CHAPTER THREE

Literature Review

In reviewing the literature and research, information will be organized in alignment with the research questions. The questions provide a format for information to be addressed and discussed throughout the literature review. Another subtopic discussed in this chapter is why the review focuses on ASL rather than other types of sign language. In this literature review the research does reveal that sign language is very beneficial for most children. Although there are problems addressed in the discussion, the benefits of using sign language with most young children are much greater than the problems.

Present Problem/Research Questions

There seems to be limited but high-quality research supporting sign language use with babies and toddlers. Some of this high-quality research was conducted by Acredolo, Goodwyn, and Brown, (2000), Daniels (1993), and also Daniels (2003). Less research has been conducted with preschool and school-aged children. In school-aged and preschool classrooms, teachers have students who arrive and who seem to not be ready to enter school. Sometimes these students who seem to be immature for their age can frequently behave as if they are still in their toddler years, particularly, while in preschool. If research supported baby and toddler sign and some students are developmentally younger than their chronological ages, then teaching sign language may be a valuable support in the preschool classroom as well.

Research Questions

1. What are the potential benefits of using sign language in the preschool classroom?

2. What are the problems of using sign language in the preschool classroom?
3. How could signing be implemented into the preschool curriculum?

Subtopics to be Addressed

Why ASL and not a simpler sign?

American Sign Language is a complex language to learn. Children may have trouble learning this system due to the fine motor demands it requires. I have read many discussion boards on the internet where people argued over different types of sign for children. My review focused on ASL due to the easy accessibility and common knowledge for educators.

Implementation into curricula is also considered when focusing on ASL in this review. Trainings are provided regularly through local community colleges and universities as continuing education classes. Fine motor skills to communicate through ASL are more complex but research also suggests that sign language is easier to learn than any spoken language (Bonvillian, Orlansky, & Novack, 1983).

Evidence and Ideas Synthesized

What are the potential benefits of using sign language in the preschool classroom?

In preschool, children begin learning their written alphabet. Sign language would provide the opportunity for a student to tie that concrete knowledge from their hands into the abstract knowledge of letter recognition (Feekes, Good, & Shawd, 1993).

Rawlinson (2006) found after dividing 140 11-month old babies into two groups, that children who signed at home did have a verbal advantage. This longitudinal study divided children into two groups of signing at home and not signing at home. The data revealed that at age 24 months, the babies who were signing at home showed a three

month verbal advantage. At 36 months they had an 11 month verbal advantage. This data also revealed that the children signing at home had an IQ score 12 points higher at age eight.

Daniels (2003) completed a study in which 688 kindergarteners were randomly assigned to classes with 24 teachers divided into A.M. and P.M. classes. The study was carried out over seven months from October through April. Fifteen students were chosen with no known disabilities in an A.M. class and no previous knowledge of American Sign Language. The teacher had 20 years experience teaching and had some sign language knowledge. A deaf signing teacher was also assigned to the classroom. ASL was her first language. This deaf teacher taught one day a week working with one third of the class at a time. She taught with only ASL and used no talking or mouthing of English words. At the end of the research, each child was exposed to 12 hours of ASL in the classroom. This idea was added to the kindergarten classroom to find out if students could acquire sufficient ASL during one year to achieve bilingual ability in ASL and English. After the instruction time was over in April, students were evaluated in fingerspelling, execution of signs, and comprehension. Students were evaluated on a scale and results suggested that the girls typically did better than the boys in using their ASL to communicate. The students were able to communicate effectively with their deaf teacher after the research was completed and continued to practice even after the teacher was gone. Students often showed their families and friends different signs.

Teachers who used facial expressions and added voice inflection throughout their teaching have demonstrated more successful information transfer (Chang & Larson,

2007). The facial expressions and voice inflection added with sign language created an invigorating learning experience for the preschool students.

Daniels (1993) stated, in a summary of her many research studies, that using American Sign Language in a preschool classroom increased vocabulary. Daniels' research also suggested that preschool students who use sign language in addition to oral language will have more language development throughout the year and also the opportunity to have more cognitive development later in life (Daniels, 1993). This idea of developing cognitive skills was also supported by additional research.

Goldin-Meadow and Ozcaliskan (2005) found that using gestures made speaking less difficult for the brain to process. By making speech easier, extra cognitive resources are able to help in creating more complex ideas when communicating. Our brains are working hard in communicating what we are thinking. With gestures and visual help from ASL, students were able to develop and utilize more ideas and thoughts. Goldin-Meadow and Ozcaliskan found this information with 40 English-speaking children and their caregivers. Children were observed for 90 minutes at 14, 18, and 22 months of age. Speech, gestures and the relationship between speech and gestures were studied. Research found that the children did increase their use of speech and gestures. The study was designed to research if there was a resemblance of gesture and speech combinations between children and their caregivers. Research did suggest that gestures are an early device for children and many times they paired gesturing with speech to reinforce what they were saying.

Goodwyn and Acredolo (1993) also examined whether children use gestures or vocalizations first. This study was completed with 22 infants who were 11 months old.

Parents were taught eight signs that they were to pair with the vocal word whenever possible. Toys were provided to encourage conversations with those eight words. Data was collected bi-weekly to find out whether children will communicate with vocalizations or with gestures when provided with skills in both areas. The study found that children used gestures about a half month sooner than using vocalizations. The data from this study could be compared to preschool students who are non-verbal or having difficulty communicating their wants and needs.

Konishi (2007) conducted research with 26 children to find how sign is beneficial. The researched classroom consisted of multiethnic students between the ages of three and five years old. Nine of the twenty six students spoke a language other than English in their homes. Konishi began by observing the classroom and taking notes on interactions and behaviors among students. She also used questionnaires with parents and teachers. Konishi was researching to find what types of strategies children use to cope in a new setting where their language was not similar to the majority of the students. The classroom used sign language with the existing students. Konishi focused her research on a Chinese girl who had no English vocabulary when she moved into the American preschool. When the Chinese girl began observing and participating in the sign language she quickly began to learn English words. The sign language also gave her a quick way to apply her knowledge of signs to play activities throughout the room with her new friends. Many of the signs in ASL are iconic signs rather than spelled words. This means that they resemble the meaning of the word. An example of an iconic sign would be *milk*, in which the signer's closed fists with thumbs extend out from the body move up and down, giving the idea of someone who is milking a cow. Signs that are iconic will interconnect with

many of the signs that would potentially be used around a preschool classroom. Iconic signs could also connect different languages of a simple word with iconic sign. This study also suggested that using sign during activities helped students retain the information that was taught throughout the curriculum.

An alternative study conducted by Bonvillian, Orlansky, and Novack (1983) with 11 children of deaf parents using ASL showed an increase in spoken vocabulary over that of a typically developing child with hearing parents who did not use sign language. These were children of couples who had limited spoken language. The parents did use the spoken language with which they were familiar when signing. The children showed a sixth month advantage of vocabulary knowledge over comparable aged children who did not use ASL.

Many times children are able to follow directions or understand what someone is saying to them before they are able to express their own wants and needs. The development of signing could be similar to spoken language development. Children's receptive language in sign could be more advanced than their expressive language. Fine motor abilities amongst students will vary. Fine motor development plays a large role in sign language. Each student's ability in fine motor will determine the amount of sign language he or she will be able to produce.

Barriere, Herman, Morgan, and Woll (2007) studied a deaf child who was raised in a home where parents used sign language as an addition to speaking when communicating. The boy had two other siblings who were familiar with signing. This child was filmed each month for two to three hours over a twelve month span totaling 37 hours of film. Gestures were measured and classified into three different groups. The

results showed that the child became advanced in the understanding of spatial relations compared to that of same age peers. This research has shown that if we provide signing through lessons, and include positive reinforcement to children who are struggling to talk, they may learn to use sign more often. This research also supported the idea of behavior issues being minimized by sign language. Students who have language delays and get frustrated sometimes have behavior issues. With this idea, giving students a way to communicate through sign language led to fewer behavior problems.

Petitto, Holowka, Sergio, Levy, and Ostry (2004) studied two groups of hearing babies: one group who were exposed to spoken language from birth with no sign language and the other group who were exposed to no spoken language and only to sign language with deaf parents. The babies were all equal in all other developmental areas. The researchers wanted to find out if the hearing babies produced the same amount of hand movement as the sign-exposed babies would. The babies were observed at 6, 10, and 12 months of age to measure hand movement. Researchers found that babies who were exposed to only sign language moved their hands in a more controlled manner, and babies who were only exposed to spoken language moved their hands in a faster uncontrolled manner. This suggested that children who are exposed to sign language and use sign language gain more fine motor control at an earlier age. Preschool students are constantly working to gain more fine motor control with their hands.

Classrooms that used sign language were more exciting and inviting while the information being taught was more interesting and meaningful (Ohna, 2005). Ohna researched communication encounters between non-hearing and hearing students. He compared the data in these encounters to that of hearing to hearing students and non-

hearing to non-hearing students. Ten different-aged classrooms from ten different schools were involved. Special schools for deaf pupils and local schools were included. This was a one week study completed in 10 observations of 35 minutes each. The research in this study showed a large difference from classroom to classroom. Ohna discovered the importance of a positive, innovative, and reassuring teacher in each classroom. The research showed how strongly the environment of the classroom depended on the teacher and how sign was used and incorporated into classroom activities.

Kindergarten students are one year ahead of preschool students. A study by Felzer (1998) is valuable to the review because preschool students are working to become successful kindergarten students and their ages are not so incomparable that we cannot compare data from research. This study by Felzer reflecting sign language use with kindergarten students could potentially show benefits for preschool students as well. Felzer began research with 25 kindergarten students from low socio-economic families in which the majority of the students were speaking Spanish as their first language. The students were given a pretest in alphabet knowledge, sounds, and sight words in August. No students were familiar with any of these reading areas. The kindergarten teacher added sign language to each reading lesson. In May the students were tested again and results showed that 21 of 25 students were reading at a first grade level and seven of the students were reading at an even higher level. There was only one student who was reading below grade level, and this student had been absent for extended periods of time for health related reasons. This research suggests that using sign language to support reading activities increases student achievement.

What are the problems of using sign language in the preschool classroom?

Finding evidence to support teaching and using sign language in preschool classrooms was easier than finding evidence to show disadvantages and hindrances. Using American Sign Language in any setting can be as straightforward or as elaborate as the signer or teacher makes it.

In studying sign language it is important to know that in early childhood there are various types of sign language used. Baby Signs is a sign language that has been developed primarily for parents to use at home (Acredolo & Goodwyn, 2000). Parents also use American Sign Language (ASL) and many other names for systems and packages sold such as Baby Signs (Baby Sign, 2008), Signs for Me (Bahan & Dannis, 1990), Baby See 'N Sign (Baby See 'N' Sign, 2002). The sign that is taught in the homes is typically a simpler version of ASL. This may lead to inconsistency for children's understanding sign between the preschool and the home settings. Each developer of baby sign has an opinion of why ASL is too difficult to learn. In preschool years ASL would be universal for administrators, preschool teachers and programs to utilize when developing curricula. In addition, it would be uncomplicated to build upon the children's existing knowledge of a baby sign system when changing to ASL in preschool.

The amount of input that each teacher puts into sign language could also make a difference in the amount of sign a child learns. Meier, Pizer, and Walters (2007) studied three families who were beginning to use sign language with their babies. Researchers observed and questioned to find out how useful the sign language was. Researchers found that the amount of prompting from parents determined the amount of sign language use in children. Children also seemed to diminish their sign usage when they began to use more

vocalizations. This research suggested that the amount of advances made because of sign language in cognition, vocabulary, and memory were based on family ideologies rather than the sign language itself.

There are families who teach their child baby sign language in the home so that children will have a way to communicate when they do not have the ability to speak. This Baby Sign is not ASL sign language. The signs in this are more generic and represent an item more closely than they do in ASL (Acredolo, Goodwyn, & Brown, 2000). Acredolo, Goodwyn, and Brown found that sign language does increase expressive and receptive vocabulary when used with young children. After studying 103 children from the ages of 11 months to 36 months, the research suggested that children who were exposed to symbolic gestures did have an increase in verbal expressive language.

Research has shown that children do not understand iconic sign until the ages of 3-5 (Gokhale, Lederberg, & Tolar, 2007). Gokhale, Lederberg, and Tolar studied 66 hearing preschoolers from three different preschools to find out if children were more fluent in sign language because of more language development or because of more cognitive development. Research suggested that children develop a connection for iconic sign and the meaning around the age of three years. Abstract sign language, such as finger spelling, is even more difficult for children to learn and this association is not made until around the age of five years.

If children do not understand the idea of representation then does it make more sense to begin the early years of signing with the correct ASL formations? Children have a harder time making the ASL gestures because their fine motor skills are not yet developed (Acredolo & Goodwyn, 2000).

Another problem with sign language could be the amount of regression that occurs over the summer as often occurs with academics. This regression could happen with the sign language knowledge. Capirci, Cattani, Rossini, and Volterra (1998) found regression in a study with students. Twenty eight children from two classrooms were involved in a two year study to find if sign language increased cognitive skills. The average age of the children was 6.5 years. Half of the children were learning Italian Sign Language one hour per week and the other group had no exposure to any kind of sign language. Students were tested at the beginning of their first year in school, end of their first year, beginning of their second year, and end of their second year in academics. Students who received the sign language training increased their scores in the first year from the 50th percentile to just below the 90th percentile. The students who did not receive sign language stayed below the 50th percentile the entire year. Students who received the sign language training did show some regression from the end of their first year to the beginning of their second year but these students were still far ahead of the control group at the beginning of the second year. By the end of their second year with sign language training students were just below the 90th percentile while students who did not receive the training stayed just below the 50th percentile. This research suggested that sign language enhances nonverbal and cognitive development among young students, but that without regular use, children will regress in their signing ability.

Parents can be a problem when trying to implement sign language with students as well (Robertson, 2007). Robertson stressed the importance of parent education when using sign. Many parents can be skeptical or upset because they have a fear that “sign language will stifle oral language use rather than facilitate it” (Roberston, 2007, ¶ 2).

Providing parents with resources, information, and support may prevent distress and hostility.

Chang and Larson (2007) read a book to 33 preschool children between the ages of three and five. Researchers wanted to know if students would remember different adjectives on each page describing different animals. This research did not find an increase in the memory of adjectives, as the researchers hypothesized, but the children were prone to remembering the animals more. Researchers also found an increase in the number of children attending to the story when teachers used sign language. Students became very excited about learning a new sign and even sometimes took this knowledge home to teach to other family members.

How could signing be implemented into the preschool curriculum?

Implementing ASL into the curriculum can be as simple or as detailed as the teacher in the classroom chooses. Feekes, Good, and Shawd (1993) recommended implementing sign language in the classroom with music by adding actions with sign language and also with short finger plays with sign language to tell the story. They also suggested implementing sign language, especially iconic sign, at any time during the school year. Adding sign language to daily routines will be a great addition to any schedule. Feekes, Good, and Shawd also suggested that behavioral issues that come into play with any classroom may be minimized with sign language warnings rather than verbal interruptions.

Thompson, Cotnoir-Bichelman, Tate, McKerchar, and Dancho (2007) conducted two experiments involving sign language and children with negative behavior. The first experiment involved two children, one who had Down syndrome (ten months), and

another child (six months) who showed signs of a typically developing baby who did not communicate vocally. In this research experimenters were evaluating the reinforcements and rewards that sign gives children. The second experiment involved two boys who were notorious for crying or whining when they needed or wanted something. The experimenters hoped to replace this behavior with sign language. Both research studies supported the idea that negative behaviors in children can increase when barriers, such as low expressive communication skills, are present; however, using sign language may reverse those behaviors. When teaching children sign it is appropriate to have prompts to help remind children to replace the negative behavior with sign language. The prompting will slowly decrease as children learn to use the sign language without reminders.

Sign language has been proven to help students who are struggling to spell in first grade (Wilson & Teague, 1984). Wilson and Teague (1984) examined seven students with poor spelling scores. An intervention with finger spelling through signing to learn spelling words was implemented with these seven students. The instructional strategies included: introducing the word, alphabetizing, and finger spelling, as well as placing missing words into sentences while signing, and finally, testing. This intervention took place for 10 weeks and a final test was given to examine retention. Nearly every student's score increased 100% from the baseline score. The strategies from this study could be implemented into a preschool classroom while teaching small sight words and name spelling.

Teachers who use sign language in their classrooms typically have sign language knowledge from finding the information independently. If schools or programs decided to implement sign language in preschool classrooms, the administration would have to

provide training and instruction in ASL. Collaboration between administration and teachers would have to take place in order to decide how much or how little ASL would be used each day. Abilities and preferences among students will demand differentiation from the teacher. A research based universal plan of implementation into preschool curriculum will provide administrators and teachers a place to start when determining how ASL should be implemented into the preschool curriculum.

Evidence shows that using sign language in the classroom supports development in most students. Deciding on how to implement sign language and what type of sign to use could become an argument among teachers and administrators. Students who move from district to district could have to change their thought process when the sign language used isn't universal among different programs. Finding a middle ground with American Sign Language gives teachers easy access to learning through internet and classes offered at most universities and community colleges.

CHAPTER FOUR

Conclusions and Recommendations

The research behind sign language use with children seems overwhelmingly positive (Acredolo, Goodwyn, & Brown, 2000, Barriere, Herman, Morgan, & Woll, 2007, Bonvilliam, Orlansky, & Novack, 1983, Chang & Larson, 2007, Daniels, 1993, Daniels, 2003, Feekes, Good, & Shawd, 1993, Felzer, 1998, Gokhale, Lederberg, & Tolar, 2007, Goldin-Meadow & Ozcaliskan, 2005, Goodwyn & Acredolo, 1993, Konishi, 2007, Meier, Pizer, & Walters, 2007, Ohna, 2005, Petitto, Holowka, Sergio, Levy, & Ostry, 2004, Pugh-Barratt & Rohl, 2001, Rawlinson, 2006, Roberston, 2007, Thompson, Cotnoir-Bichelman, Tate, McKerchar, & Dancho, 2007, Wison & Teague, 1984). As an educator, I have worked very hard to make sure I provided my students with any tools that I can to help them grow as individuals. It seems to be very obvious that the use of sign language in the classroom will help children. Other than the few courses or maybe trainings it would take for teachers to become accustomed and familiar with ASL, the inconvenience of this process seems very minimal for each teacher involved.

Conclusions

Sign language supports many aspects of a child's growth and development. The research completed with babies and sign language suggested that sign is appropriate to many aspects of a preschool classroom. The growth in vocabulary, cognitive development, and self esteem alone would be encouragement enough for most teachers. The potential increase in IQ scores also reinforces the value of using sign language in my classroom. Finally, transitions can be very hard for students throughout the day. If sign

language can ease these times and make them less chaotic and stressful on students and teachers, more learning could possibly occur with less anxiety.

Identification and Synthesis of Insights

In examining research by Acredolo, Goodwyn, and Brown (2000), Barriere, Herman, Morgan, and Woll (2007), Bonvilliam, Orlansky, and Novack (1983), Chang and Larson (2007), Daniels (1993), Daniels (2003), Feekes, Good, and Shawd (1993), Felzer (1998), Gokhale, Lederberg, and Tolar (2007), Goldin-Meadow and Ozcaliskan (2005), Goodwyn and Acredolo (1993), Konishi (2007), Meier, Pizer, and Walters (2007), Ohna (2005), Petitto, Holowka, Sergio, Levy, and Ostry (2004), Pugh-Barratt and Rohl (2001), Rawlinson (2006), Roberston (2007), Thompson, Cotnoir-Bichelman, Tate, McKerchar, and Dancho (2007), Wison and Teague (1984), I did not find any negative effects of using sign language in the classroom. Parents and teachers can look forward to growth and development in a variety of areas including self esteem. This is such a great opportunity for so many children. As an educator I work hard to help develop each child in the best way possible. This research makes me feel like there is no other option but to implement sign language into my preschool classroom. I currently use sign language in a variety of contexts, but I am confident that I need to add it to more areas of my daily routine.

Implementation in the classroom can be as simple or as detailed as any teacher makes it. Sign language can be used in the daily routines, such as calendar, transitions, reminders and behavior warnings. It could also be incorporated into letter recognition, songs, rhymes, and even with stories. It seems that following the direction of the class would make the most sense. If a teacher begins by adding ASL to routines and transitions

and the students are learning quickly, then adding more signs seems logical from the review. There will most likely be some students who enjoy it more and others who don't seem to be learning at all. I use sign in a variety of my classroom activities, and I find that there are some students who use it more than others to help recall their letters, while others use it to help remember the order of the days of the week. Providing my students with a variety of methods and opportunities has given each of them a tool to use whenever they individually need it.

Sign language gives children a variety of opportunities to increase their skills in IQ (Rawlinson, 2006), increased vocabulary (Rawlinson, 2006, Daniels, 1993, Bonvillian, Orlansky, & Novack, 1983, Acredolo, Goodwyn & Brown 2000), cognitive development (Goldin-Meadow & Ozcaliskan, 2005), increased knowledge in spatial relations and increase behavior control (Barriere, Herman, Morgan, & Woll, 2007), and controlled hand movement (Petitto, Holowka, Sergio, Levy, & Ostry, 2004). These things alone are skills that preschoolers are continuously developing when completing art projects, group projects, center play, and any other activity throughout their day. Giving children the opportunity to increase their skills in these areas could potentially encourage them to grow stronger in other areas that teachers work on as well. I believe that if children begin to learn ASL then this is the beginning to learning a second language that could potentially benefit them throughout their adult lives. Children who are bilingual do have advantages later in life (Pugh-Barratt & Rohl, 2001). Children need as much assistance as possible when they are working at school to become a well-balanced individual in and out of the classroom.

Learning the colors, shapes, numbers, days of the week, months of the year, centers around the room, and jobs throughout the day could potentially be accomplished more quickly and consistently with the use of sign language. Using sign consistently in the classroom will give children the opportunity to develop their knowledge and increase their comfort level with sign language. This will also give them the opportunity to learn more language (sign and verbal) before entering into kindergarten.

Chang and Larson (2007) failed to find research to support their theory that sign language would enhance short term memory. After analyzing their research methods, Chang and Larson did suggest that further research, in the area of memory, would be beneficial for educators. Their research was using adjectives and this may have been too complicated for such a young age. Studying nouns rather than adjectives may have provided better results with young children. Chang and Larson did discover through their research that children did show much more excitement toward the story when sign language was involved in the teaching and reading. They also found that students were excited about what they did learn at school and were taking their knowledge home to teach their family members.

There will be obstacles when implementing sign language in the preschool classroom as there are when implementing any new type of curriculum, strategy, or innovative idea. Being aware of these obstacles is the first step in overcoming them. A Meier, Pizer, and Walters (2007) research study suggested that the increased development in cognition, vocabulary, and memory is not from what the child learns but how the instructor presents the lesson or information. The work and attitude of the teacher is just as important as the lesson itself. This suggested that teachers who are

excited to see students grow and succeed are important. Teachers who are familiar with what students need as far as prompting, encouragement, success, and even failure will be vital in the development of each young child.

Another obstacle that teachers could possibly face is the parents (Robertson, 2007). Parents can be negative about new ideas in the classroom. Providing parents with research and information to show the growth that can occur over time will help decrease this barrier. I have learned in my years of teaching that also building a strong relationship with parents and family members will help with this as well. Parents trust a teacher that they respect and of whom they are fond. With a strong relationship, parents will trust a teacher who is providing innovative ideas in the classroom.

Gokhale, Lederberg, and Tolar's (2007) research suggested that iconic sign is not understood until ages 3-5. If this is true, teachers may begin to question how sign is beneficial in the classroom if the students don't understand it yet. When I thought about this notion I began to think about how adults visit with babies even though we know that they can't understand what we are saying. Alice Sterling Honig, PhD (2009) reminds us that talking with a baby encourages language development. Therefore, signing with a baby should encourage language development.

In synthesizing the information about talking to babies who don't yet understand, and the research on signing to children who cannot understand iconic sign, it makes sense that the information would go hand in hand. In turn the children who see people signing will soon gain those skills in receptive and expressive sign language.

Capirci, Cattani, Rossini, and Volterra (1998) were concerned with the amount of regression that occurred out of school with sign language development. Their research

showed that children did regress over the summer vacations and more lessons needed to be taught at the beginning of the second year to help children catch up on their learning. This is something that every teacher faces when teaching any type of curriculum. When we begin teaching a new year it seems that there is a large amount of time spent on review. This is something teachers have learned to plan for.

Recommendations

In recommending how to implement sign language I carefully looked at a variety of research included in this review and also took into account the knowledge and experience from teaching in my own classroom. In teaching sign language I have learned a variety of things that have been very beneficial for many of my students. I have synthesized the information and created recommendations. Through researching sign language and uses in the classroom I have found that much of the research about babies using sign language applies to the preschool classrooms. Many of the activities that occur with babies involving socialization, routines, transitions, verbal requests, and following simple instructions also occur in preschool classrooms. The intellectual growth found with babies using sign language will help in later years (Acredolo, Goodwyn, & Brown, 2000). This idea applied to early childhood classrooms could further this growth in later years for students and promote even more development in areas such as memory, speech, fine motor and more clear thought processes. Recommendations for teachers to use sign in their classrooms include the following:

1. For teachers who are just beginning to use sign, start by implementing sign language to help with behaviors that occur during large group time, such as *stop, bathroom, quiet, sit, look, listen, wait, yes, no*, and any

others that pertain to activities that take place in the classroom or on the playground. For instance, when reading a book, students can show the teacher the sign for bathroom rather than raising their hands and asking. The teacher can sign back the answer. Students who are looking out the window could be quietly tapped on the leg and instructed to *look* at the book without any verbal interruptions for other students (Feekes, Good, & Shawd, 1993, Thompson, Cotnoir-Bichelman, Tate, McKerchar, & Dancho, 2007).

2. While implementing sign language during group activities, add sign language in connection with alphabetic letters. Signs for letters can be found on the ASL web browser (Michigan State University Communication Technology Laboratory, 1997). If students are familiar with any letters in the alphabet they can begin by learning the letters in their first names. Research by Wilson and Teague (1984) incorporating sign language into sight words supported using ASL with letter recognition to increase reading skills.
3. After students seem comfortable with letters and simple signs during large group; signs for the days of the week, types of weather, and counting can be added to the morning. Singing days of the week songs occurs in many classrooms. Adding signs to this song is fun and new for students. The songs may have to be slowed down when singing for students to view the differences in signs for each day. When discussing the weather outside the teacher can begin by using sign each day, and

students will slowly pick up on the signs. Counting from 1 to 10 can be taught in small groups and incorporated when counting the days on the calendar.

4. Implement sign language into the schedule for the day and also with the names of each center around the room. Some teachers have a schedule posted for students to view and this is reviewed for students. Some schedules include pictures for calendar time, center time, snack time, art time, recess, snack, rest, lunch, story time and many other activities. When reviewing the schedule with students the teacher can sign and also review these points throughout the day. Some centers around the room include blocks, housekeeping or dramatic play, math, science, writing, art, puzzles, reading, listening, sensory, manipulatives, trains, ramps, and many others. Incorporating sign language into the center names is an additional way to implement sign into the classroom.
5. As students show an increased interest in sign language, teachers should implement as they see fit within their classrooms. There may be years that more sign is implemented than others. This is the case with any activities that teachers conduct in their room. It is common to analyze what students need and plan accordingly.

Future Projects/Research

My future project is to become fluent in sign language. I currently implement sign language into stories and fingerplays, as well as with many of my students who are non-verbal due to special needs. I also use sign with letter recognition, calendar routines, and

with our weather chart. Incorporating sign language into daily activities and transitions is my next goal. My classroom can benefit from using sign language with finger spellings, behavior situations, and transition cues, as well as other miscellaneous areas of our day.

Further research to discover verbal advantages for preschool children and also how sign eases the transition into kindergarten could be beneficial. Longitudinal research, including preschool students who were in a sign exposed setting compared to those who were not, could also benefit teachers who are thinking about incorporating sign language into their classrooms.

More research with hearing preschool students and the effects of sign language on IQ scores would also be beneficial. Knowing the effect of using sign language, rather than verbal cues, when correcting students or asking for their attention would be useful for teachers as well. Some students require constant reminders to keep on task during activities and knowing if sign language would help may benefit teachers who are feeling overwhelmed with students like this.

Educational Policies

School board members across Iowa are currently becoming more and more familiar with their preschool classrooms as demands are placed on teachers by the state. Entering into a free preschool program at the age of four is a wonderful opportunity for many Iowa children. Incorporating sign language into the Iowa Early Learning Standards could support children learning sign; it also could be potentially very overwhelming for schools that do not have anything in place as far as preschool is concerned. Universities' early childhood programs across the nation are very familiar with ideas and research that

benefit young children. Providing college students in these early childhood programs with classes in ASL could benefit teachers and students in the future.

Teacher Practices of Self and Others

The implementation of sign into the preschool classroom can be very inviting for students. Having mini lessons on signs and then short reminders can be very easy for implementation. Teachers should remember to incorporate sign language as they see fit. Some students may crave sign language in many activities and throughout the day while others may not. Following some of the recommendations listed above is a great way to begin using sign language in the classroom. Flexibility is required as it is when implementing anything new into a preschool classroom. Persistence and consistency are the keys for student success.

REFERENCES

- Acredolo, L. P., & Goodwyn, S. W. (2000). Original baby signs study. *Human Development, 28*, 40-49.
- Acredolo, L. P., Goodwyn, S. W., & Brown, C. (2000). Impact of symbolic gesturing on early language development. *Journal of Nonverbal Behavior, 24*(2), 81-103.
- American Sign Language. (2009). In Merriam-Webster Online Dictionary. Retrieved January 25, 2009, from [http://www.merriam-webster.com/dictionary/American Sign Language](http://www.merriam-webster.com/dictionary/American%20Sign%20Language)
- Attention Deficit Disorder. (2009). In Merriam-Webster Online Dictionary. Retrieved January 25, 2009, from [http://www.merriam-webster.com/dictionary/American Sign Language](http://www.merriam-webster.com/dictionary/American%20Sign%20Language)
- Baby. (1997). American Sign Language Browser. Retrieved June 15, 2009, from <http://commtechlab.msu.edu/sites/aslweb/browser.htm>
- Baby See 'N' Sign. (2002). Baby See 'N' Sign research. Retrieved May 9, 2009, from <http://www.babyseensign.com/research.htm>
- Baby Signs. (2008). Baby Signs Program. Retrieved May 9, 2009, from <https://www.babysigns.com/>
- Baby's Sign to Communicate. (2006). Baby's sign to communicate. Retrieved June 4, 2009, from <http://away2read.wordpress.com/2008/05/06/babys-sign-to-communicate/>
- Bahan, B. J., & Dannis, J. (1990). *Signs for me: Basic sign vocabulary for children*. Berkeley, California: DawnSignPress.

- Barriere, I., Herman, R., Morgan G., & Woll, B. (2007). The onset and mastery of spatial language in children acquiring British Sign Language. *Cognitive Development, 23*(2), 1-19.
- Bonvillian, J. D., Orlansky, M. D., & Novack, L. L. (1983). Developmental milestones: Sign language acquisition and motor development. *Child Development, 54*, 1435-1445.
- Capirci, O., Cattani, A., Rossini, P., & Volterra, V. (1998). Teaching sign language to hearing children as a possible factor in cognitive development. *Journal of Deaf Studies and Deaf Education, 3*(2), 135-142.
- Chang, I. J., & Larson, B. C. (2007). Enhancing hearing children's memory with American Sign Language. *Intervention in School and Clinic, 42*(4), 239-252.
- Daniels, M. (1993). Seeing language: The effect over time of sign language on vocabulary development in early childhood education. *Child Study Journal, 26*(3), 193-208.
- Daniels, M. (2003). Using a signed language as a second language for kindergarten students. *Child Study Journal, 33*(1), 53-70.
- Feekes, J., Good, L. A., & Shawd, B. (1993). Let your fingers do the talking: Hands on language learning through signing. *Childhood Education, 70*(2), 81-93.
- Felzer, L. (1998). A multisensory reading program that really works. *Teaching and Change, 5*, 169-183.
- Gokhale, S., Lederberg, A. R., & Tolar, T. D. (2007). The development of the ability to recognize the meaning of iconic signs. *Journal of Deaf Studies and Deaf Education, 13*(2), 225-240.

- Goldin-Meadow, S., & Ozcaliskan, S. (2005). Do parents lead their children by the hand? *Child Language*, 32, 481-505.
- Goodwyn, S. W., & Acredolo, L. P. (1993) Symbolic gesture versus word: Is there a modality advantage for onset of symbol use? *Child Development*, 64(3), 688-701.
- Handwriting without Tears. (2009). Pre-K Wall Cards. Retrieved May 9, 2009, from <http://shopping.hwtears.com/category/prek>
- Hossain, P. (2008). About the learning center. Retrieved February 12, 2009, from <http://www.lhup.edu/phossain/Projects/lcenter.htm>
- Honig, A. S. (2009). The importance of talking to your baby. Retrieved June 29, 2009, from <http://content.scholastic.com/browse/article.jsp?id=893>
- Houghton Mifflin. (2007). Education Place. Retrieved May 9, 2009, from <http://www.eduplace.com/marketing/prek/>
- Iconicity. (2009). In Merriam-Webster Online Dictionary. Retrieved June 15, 2009, from <http://www.babylon.com/definition/iconicity/>
- Iowa Department of Education. (2006). Iowa Early Learning Standards. Retrieved June 15, 2009, from http://www.iowa.gov/educate/index.php?option=com_content&task=view&id=681&Itemid=805
- Iowa Department of Education. (2008). Statewide Voluntary Preschool Program for Four Year Old Children. Retrieved February 11, 2009, from http://www.iowa.gov/educate/index.php?option=com_content&task=view&id=1260&Itemid=1
- Konishi, C. (2007). A case study of a Chinese girl in an American Preschool. *Association for Childhood Education*, 33(2), 289-333.

- Manipulatives. (2009). In Merriam-Webster Online Dictionary. Retrieved January 25, 2009, from [http://www.merriam-webster.com/dictionary/American Sign Language](http://www.merriam-webster.com/dictionary/American%20Sign%20Language)
- Meier, R. P., Pizer, G., & Walters, K. (2007). Bringing up baby with baby signs: Language ideologies and socialization in hearing families. *Sign Language Studies*, 7(4), 387-430.
- Michigan State University Communication Technology Laboratory. (1997). ASL Browser. Retrieved June 5, 2009, from <http://commtechlab.msu.edu/sites/aslweb/browser.htm>
- Ohna, E. S. (2005). Researching classroom processes of inclusion and exclusion. *European Journal of Special Needs Education*, 20(2), 167-178.
- Petitto, L. A., Holowka, S., Sergio, L. E., Levy, B., & Ostry D. J. (2004). Baby hands that move to the rhythm of language: Hearing babies acquiring sign languages babble silently on the hands. *Cognition*, 93, 43-73
- Pugh-Barratt, C., & Rohl, M. (2001). Learning in two languages: A bilingual program in Western Australia. *The Reading Teacher*, 54(7), 664-676.
- Rawlinson, K. (2006). Baby Sign. *Introduction to language development*, Retrieved March 30, 2008, from <http://www.lifeprint.com/asl101/topics/babysigning3.htm>
- Robertson, S. (2007). Using sign to facilitate oral language: Building a case with parents. Retrieved June 30, 2008, from http://www.speechpathology.com/articles/article_detail.asp?article_id=315
- Scholastic. (2009). AlphaTales. Retrieved May 9, 2009, from <http://www.scholastic.com/elt/alphatales.htm>

Sternberg, R. J., & Williams, W. M. (2002). *Educational Psychology*. Boston, Massachusetts: Allyn and Bacon.

Thompson, R. H., Cotnoir-Bichelman, N. M., Tate, T. L., McKerchar, P. M., & Dancho K. A. (2007). Enhancing early communication through infant sign training. *Journal of Applied Behavioral Analysis*, 40(1), 15-23.

Wilson, R., & Teague, G. V. (1984). The use of signing and fingerspelling to improve spelling performance with hearing children. *Reading Psychology: An International Quarterly*, 5, 267-273.