NEW DIRECTIONS IN DEAF EDUCATION VOL. 13 • 2012

ODYSSEY

research to practice

GALLAUDET UNIVERSITY
LAURENT CLERC NATIONAL DEAF EDUCATION CENTER

ODYSSEY

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On the cover: *Integrating signing and board work results in fewer visual shifts for deaf and hard of hearing students (see Mather & Clark's article on page 20 of this issue). This is one example of how evidence-based instructional strategies facilitate effective classroom instruction for students. Cover photo by John T. Consoli.*

We would like to thank all of the student and teacher models from the Clerc Center for their assistance in illustrating this issue. We also warmly remember student Timothy Keith (2007-2012), who is pictured on page 15 (at left).

FEATURES

NEW DIRECTIONS IN DEAF EDUCATION
VOL. 13 • 2012

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Bringing the Best to Classrooms

We live in a diverse and constantly changing global community in which the role of educators has never been more important in shaping the future. Teachers and school leaders are charged with the daunting task of preparing our youth to become our future leaders in an era of unprecedented accountability.

If we acknowledge that teaching is both an art and a science, then we concede that the strategies and techniques employed by teachers cannot always be grounded in scientific evidence. Sometimes it is through trial and error, intuition, risk taking, and innovation that teachers address the diverse needs of the students they serve. However, employing research-based strategies is imperative if we are to replicate our successes and improve outcomes.

The Clerc Center is pleased to bring you this issue of *Odyssey*, which focuses on the important area of research to practice. The connection between teaching and research is critical to successful outcomes in the classroom but has been, at times, elusive in the education of deaf and hard of hearing students. Although there is an enormous body of research focusing on K-12 education, in comparison there is an extremely small corpus of research focusing on the education of deaf and hard of hearing children.

The role of schools has become more complex, with increasing demands in an ever-changing world. Doing more with less has emerged as a theme among schools across the country in an era where accountability and outcomes have emerged as a central focus. This unprecedented shift has also pushed research and evidenced-based practices to the forefront with teachers and school leaders.

In this issue of *Odyssey*, the articles explore the notion of research to practice in a variety of contexts at the macro and micro level as well as the challenges associated with ensuring that instruction for deaf and hard of hearing students is rooted in effective evidence-based practice.

It is my hope that these articles represent a starting point for continued sharing and professional dialogue which is so greatly needed in our profession. I extend my sincere appreciation to those who contributed to this issue of *Odyssey*. I am confident that it will serve as a valuable resource for others in the field, as well as a catalyst for more sharing of research-based practices to ensure that we are always bringing the best to our classrooms for deaf and hard of hearing students.

Thank you for joining us in this issue! Please be sure to share your thoughts and comments with us at *Odyssey@gallaudet.edu*.

—**Edward Bosso**
Vice President
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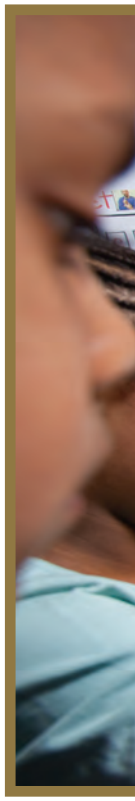
research:
how it supports teaching and learning

By Natalie Zwerger and Elizabeth Greninger



Educators, academics, and social scientists conduct educational research across the globe, producing scientific evidence that can inform teaching practice. How can such research aid teachers in using effective practices in their classrooms? How can teachers ensure that educational research is applicable to the diverse groups of learners in their classrooms? How does research-based instruction support student learning?

What is research-based instruction?

The National Research Council suggests that educational research has two purposes: "…to add to fundamental understanding of education-related phenomena and events, and to inform practical decision making" (Towne, Wise, & Winters, 2004). As any teacher or school administrator knows, there are countless journals, articles, and websites that produce educational research, so practitioners must be savvy about selecting research to apply to their classroom. Pearson (1999) contends that educators "have a professional responsibility to forge best practice out of the raw materials provided by our most current and most valid readings of research." The No Child Left Behind Act of 2001 defined "scientifically based research" as research that employs systematic, empirical methods, involves rigorous analysis of data, relies on methods that are reliable and valid, and has been peer-reviewed ((20 U.S.C. § 1411(e)(2)(C)(xi)).

How can research-based instruction support learning?

There have been many scientifically based studies demonstrating that the use of a wide range of researched-based strategies can support the academic achievement of students in a variety of settings. The following are examples of research that demonstrate effective educational practice:

- Mosteller, Light, & Sachs (1996) reported that a reduction in class sizes in grades K-3 had the effect of improving reading and math test scores.

Photos by John T. Consoli

- The National Reading Panel (2000) conducted a study of more than 100,000 students and reported that those receiving interventions in phonemic awareness and phonics read more proficiently than 70 percent of their peers in a control group.
- Campbell, Ramey, Pungello, Sparling, & Miller-Johnson (2002) reported that high quality child care and preschool for low-income children resulted in improved educational outcomes, such as college attendance, later in life.

The Coalition for Evidence-Based Policy (2003), in collaboration with the U.S. Department of Education, created a user-friendly guide and detailed checklist to assist practitioners in evaluating whether or not a study is supported by rigorous evidence.

How can teachers implement research-based instruction?

The way in which teachers implement research-based strategies can affect student achievement. Factors contributing to the way a strategy is implemented include the fidelity with which the teacher duplicates the strategy, the teacher's willingness to attempt the use of a new instructional practice, and the level of administrative and collegial support offered to the teacher in the application of the innovative practice. In addition to considering the technical aspects of a piece of research, practitioners must also determine how they can best duplicate specific research-based methods within the context of their own classrooms.

Robert Marzano has conducted many studies within the field of education, one of which involved almost 8,000 students being placed in experimental groups to receive a particular instructional strategy and over 6,000 other students placed in control groups not receiving the strategy. In a pre-test/post-test comparison, the students in the experimental groups gained 16 percentage points over the students who did not receive the strategy (Marzano & Haystead, 2009). In evaluating the results of this type of study, it is important for educators to realize that simply implementing a strategy does not necessarily equate to improved student learning outcomes. The teacher must also use the strategy as designed and with fidelity.

TEACHERS MUST BE WILLING TO ATTEMPT THE USE OF NEW INSTRUCTIONAL PRACTICES

Anyone who has been a teacher or who knows one can attest to the many demands on a teacher's time: planning for instruction, developing differentiated

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instruction for students at various levels, collaborating with colleagues, documenting results of assessments, communicating with parents, and generally responding to any and all emergencies, surprises, and daily challenges that occur in the classroom. Being willing to learn, apply, and reflect on new instructional practices is time-consuming and challenging. No effort will be successful if the teacher is not open to experimenting and self-reflecting on his or her pedagogy. In addition to the commitment of the individual teacher to try new strategies, the teacher must feel supported by the administration and colleagues.

TEACHERS NEED SUPPORT WHEN IMPLEMENTING NEW INSTRUCTIONAL PRACTICES

When teachers of different experience levels work together for the betterment of their students and their school, it fosters a collegial environment that can lead to effective teaching and learning (Kardos, Johnson, Peske, Kauffman, & Liu, 2001). Hargreaves (1991) describes some productive forms of collegiality, such as team teaching, collaborative planning, peer coaching, mentor relationships, professional dialogue, and collaborative action research. Stanovich and Stanovich (2003) define action research as researching one's own practice in order to improve it. While self-reflection is extremely useful for a teacher trying out a new research-based instructional strategy, discussions with colleagues, observations of colleagues using the strategy, and collaborative planning also serve to strengthen the learning experience for the teacher.

Administrators that build trust between themselves and staff members tend to encourage collaboration and teacher development that demonstrate a shared responsibility for school success (Kardos, Johnson, Peske, Kauffman, & Liu, 2001; Youngs, 2007). Through both direct and indirect actions, such as providing time, space, and resources for teachers to work together, and by being responsive to teachers' changing needs, school administrators can signify to teachers that it is an important school goal to help them develop as professionals.

How can teachers access research-based studies?

When a teacher is continuously exposed to new studies on teaching and learning, he or she is opening up a range of possibilities for success that have been documented among other groups of students. There are several resources teachers can use to access research-based studies, including professional literature, communities of practice, and literature groups.

PROFESSIONAL LITERATURE

Professional literature available to teachers includes, but is not limited to, education journals, non-fiction texts, websites, webinars, and web-based courses. Each provides information on current trends, studies, techniques, and strategies to support learners. There are also scientific research-based studies available at the following websites (although this list is not exhaustive):

- U.S. Department of Education website—*www.ed.gov*
- What Works Clearinghouse—*http://ies.ed.gov/ncee/wwc/*
- American Educational Research Association—*www.aera.net*
- *Journal of Educational Psychology— www.apa.org/pubs/journals/edu/*
- *Reading Research Quarterly— www.reading.org/General/Publications/Journals/RRQ.aspx*
- *Journal of Literacy Research—http://jlr.sagepub.com*
- *Journal of Learning Disabilities—http://ldx.sagepub.com*
- *Scientific Studies of Reading—www.nrrf.org/sci_studies.htm*

PROFESSIONAL DEVELOPMENT

By reading professional literature and engaging in dialogue with other like-minded professionals, educators may access information and new ideas that empower them to take action in their own classrooms. Apart from reading studies in journals, practitioners can volunteer to participate in studies being conducted at local colleges and universities or become involved in research being conducted at their own school. Educators can also contact the original researcher of a study they have read to inquire about having the researcher come to the school to discuss the findings or present a professional development session for the staff.

Practitioners can also rely on professional development as a source for the latest research on educational issues. The quality of professional development and whether or not it allows teachers to actively participate in hands-on learning can impact the implementation of strategies learned (Blank, de las Alas, & Smith, 2007). As suggested by Cherubini (2007), collegial relationships can develop as experienced teachers model and share effective practices, often having the effect of developing a mutual exchange of ideas and resources between teachers. Much of what educators learn through their review of current educational research can then be turned into a professional development opportunity for groups of teachers with a particular interest or need.

COMMUNITIES OF PRACTICE

Wenger (2006) defines *communities of practice* as a group of people who engage in a process of collective learning, or "groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (p.1). Within communities of practice, teachers have the opportunity to analyze data from their classroom, discuss with colleagues, reflect on personal experience, and develop responsive, research-based instruction (Darling-Hammond & Richardos, 2009). These planned and purposeful opportunities for teacher collaboration can promote research and evidence-based practices.

LITERATURE GROUPS

In addition to communities of practice, practitioners can become involved in article studies or book study groups in which they read professional literature, engage in self-reflection about the topic at hand, and have a dialogue with their colleagues on the content of the professional resource. There are several spin-off activities that can result from a literature study, which may include additional professional development sessions, teacher modeling and observation, and classroom action. Ideally, teachers will be motivated to attempt new techniques in the classroom, collect data on the effectiveness of such techniques, and share their learning with colleagues—all of which will have the effect of improving student learning outcomes and opening the door for future professional development opportunities.

The Teacher as Lifelong Learner

There is nothing more refreshing than encountering educators who pride themselves on being lifelong learners. These lifelong learners are individuals who continuously see their pedagogy as evolving in response to new discoveries of how students learn and process information. Currently, there is a striking disconnect between educational policy researchers and teachers. Neither can optimally support learning without an understanding of how the other operates. Policies and legislation are not able to effectively address the needs of students if policy makers are not aware of the reality of life in America's schools. Likewise, teachers are not able to offer the maximum level of support to their students if they are unaware of the most up-to-date, cutting edge research on effective educational practices. Both parties are working towards the same goal of creating supportive, responsive learning environments for students. Now these groups need to acknowledge that by developing a collective understanding of research-based practice, the efforts of each will be strengthened and maximized to ensure that effective teaching and learning occurs in each and every classroom in America's schools.

References

Blank, R. K., de las Alas, N., & Smith, C. (2007). *Analysis of the quality of professional development programs for mathematics and science teachers.* Washington, DC: Council for Chief State School Officers.

Campbell, F. A., Ramey, C. T., Pungello, E., Sparling, J., & Miller-Johnson, S. (2002). Early childhood education: Young adult outcomes from the Abecedarian Project. *Applied Developmental Science, 6*(1), 142-157.

Cherubini, L. (2007). Speaking up and speaking freely: Beginning teachers' critical perceptions of their professional induction. *The Professional Educator, 29*(1), 1-12.

Coalition for Evidence-Based Policy. (2003). *Identifying and implementing educational practices supported by rigorous evidence: A user-friendly guide*. Washington, DC: U.S. Department of Education, The Council for Excellence in Government.

Darling-Hammond, L., & Richardos, N. (2009). Teacher learning: What matters? *Research Review*, 46-53.

Hargreaves, A. (1991). The micropolitics of teacher collaboration. In J. Blase (Ed.), *The politics of life in schools* (pp. 46-72). New York: Sage.

Kardos, S. M., Johnson, S. M, Peske, H. G., Kauffman, D., & Liu, E. (2001). Counting on colleagues: New teachers encounter the professional cultures of their schools. *Educational Administration Quarterly, 37*, 296-321.

Marzano, R., & Haystead, M. (2009). *Meta-analytic synthesis of studies conducted at Marzano Laboratory on instructional strategies*. Englewood, CO: Marzano Research Laboratory.

Mosteller, F., Light, R., & Sachs, J. (1996). Sustained inquiry in education: Lessons from skill grouping and class size. *Harvard Education Review, 66*(4), 250-257.

National Reading Panel. (2000). *Teaching children to read: An evidence-based assessment of the scientific literature on reading and its implications for reading instruction*. Report of the National Reading Panel. Retrieved December 14, 2011, from *www.nichd.nih.gov/publications/nrp/upload/smallbook_pdf.pdf*

No Child Left Behind Act of 2001, Pub. L. No. 107-110.

Pearson, P. D. (1999). A historically based review of preventing reading difficulties in young children. *Reading Research Quarterly, 34*, 231-246.

Stanovich, P., & Stanovich, K. (2003). *Using research and reason in education: How teachers can use scientifically based research to make curricular and instructional decisions*. Washington, DC: Partnership for Reading. Retrieved December 14, 2011, from *www.eric.ed.gov/PDFS/ED482973.pdf*

Towne, L., Wise, L., & Winters, T. (2004). *Advancing scientific research in education*. Washington, DC: National Academy of Sciences, Committee on Research in Education, National Research Council.

Wenger, E. (2006). *Communities of practice: A brief introduction* (p. 1-5). Retrieved December 14, 2011, from *www.ewenger.com/theory/*

Youngs, P. (2007). How elementary principals' beliefs and actions influence new teachers experiences. *Educational Administration Quarterly, 43*(1), 101-137.

Resources

Feuer, M., Towne, L., & Shavelson, R. (2002). Scientific culture and educational research. *Educational Researcher, 31*(8), 4-14.

National Institute of Child Health and Human Development. (2001). *National reading panel reports combination of teaching phonics, word sounds, giving feedback on oral reading most effective way to teach reading*. National Institutes of Health. Retrieved December 14, 2011, from *http://nichd.nih.gov/news/releases/nrp.cfm?FROM=reading&renderforprint=1*

curriculum modification:

making standards accessible for deaf students with disabilities

By Holly McBride and Matthew Goedecke

Holly McBride, MA, teaches at the E.L. Haynes Public Charter School in Washington, D.C., in an inclusive setting. She has worked in a variety of educational roles over the course of the past 11 years, both in the United States and abroad. From 2006-2011, she worked as a teacher of deaf students with additional disabilities at Kendall Demonstration Elementary School in Washington, D.C. She received her master's degree in deaf education specializing in working with students with multiple disabilities from Gallaudet University, and continues to push all students to their maximum potential.

Deaf students with significant disabilities face unique challenges with state standards and grade-level expectations. Their teachers, too, face unique challenges. Material making, breaking concepts and tasks down into component parts, providing time and motivational opportunities for developing background knowledge and foundational skills, and addressing generalization across environments are all things that must be carefully considered and planned for within limited instructional time for students with disabilities.

We spent a considerable amount of time looking for evidence-based practices that could be applied in our schools and recommended to others. While we found little research available on deaf students with disabilities and the general curriculum, what we did find were the recommended approaches and interventions that have shown evidence of success with other children with various types of disabilities (Moores & Martin, 2006; Spencer & Marschark, 2010). We should focus on the same knowledge and skills that the standards require for children without disabilities, but the instructional approach needs to be more explicit and intensive.

One valuable approach we found came from the Human Development Institute at the University of Kentucky and outlined a clear four-step process for curriculum modification:

1. Identify and link to the appropriate standards.
2. Define the outcomes of instruction.
3. Identify the instructional activities.
4. Target specific objectives from the Individualized Education Program (IEP).

Using this approach, teachers are able to analyze the standards, clarify intended outcomes, and design instruction that incorporates other best practices and strategy instruction, including project-based learning, priming background knowledge, teaching students to monitor their own comprehension, scaffolding instruction with prompts and cues, and collaborative group work (Jitendra, Burgess, & Gajira, 2011).

Photos by John T. Consoli

My colleague Anna Rice (another middle school teacher) and I used this process each time we sat down to plan a unit. First, we looked at the standards required for the grade level and the thematic unit content. From there, we examined grade-level indicators and identified the foundational skills that were at the root of those indicators. We wanted our students to gain skills that would help them function more independently, in school, at home, and in the community.

After identifying the set of skills that we would teach, we developed the activities that would enable the students to attain those skills. As we planned, we reviewed each student's IEP goals and objectives and discussed how those goals and objectives could be addressed within this unit. We also looked for links to tie our unit to alternate assessment (where applicable) so we could collect work samples and data for portfolio use.

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The authors welcome questions and comments about this article at *hollymcbride78@gmail.com* and *Matthew.Goedecke@gallaudet.edu*, respectively.

Application

Objects, Goals, Skills—and Mystery!

Last year, we focused a unit for the English/Language Arts class on the theme of "mystery." We used the University of Kentucky's four-step process to analyze the standards, outcomes, activities, and objectives from the IEP. Here is what the process looked like:

STEP 1 - IDENTIFY THE APPROPRIATE STANDARDS.

We selected the following standards and indicators from the sixth-grade content standards:

- Vocabulary acquisition: Use context clues and text structures to determine the meaning of new vocabulary.
- Reading process: Use appropriate self-monitoring strategies for comprehension during the reading process.
- Writing process: Use graphic organizers and apply appropriate pre-writing tasks.

STEP 2 - DEFINE THE OUTCOMES OF INSTRUCTION.

We decided to focus on the essential components of what the concept of mystery represents. We wanted the students to be able to explain the concept of something that is unknown but could be understood with the help of evidence, information, or clues. According to Clayton, Burdge, Denham, Kleinert, and Kearns (p. 21, 2006), "Once the broad standard and the specific grade-level content standard are identified, it is then helpful to determine...the most basic concept that the standard defines." For our students who needed substantial modification, the most basic concepts defined by these standards dealt with reading new vocabulary and using contextual clues and visualization to self-monitor comprehension. We also focused on learning to use webs as graphic organizers to make a plan for writing, especially for writing multiple sentence clues.

Our goal has become about interpreting the standards in a way that allows all students to achieve at their own highest level and being able to explain this to others.

STEP 3 - IDENTIFY INSTRUCTIONAL ACTIVITIES.

This step—our favorite part—allowed our passion for teaching to shine, and we could brainstorm and design activities that would excite and engage our students. We decided that the

Above: Students take off to hunt for clues during the mystery scavenger hunt.

culminating project for the mystery unit would be a scavenger hunt. To successfully arrive at this final product, we methodically broke down the work into all the component steps that would lead the students to the culminating project.

STEP 4 - TARGET SPECIFIC OBJECTIVES FROM THE IEP.

This step was easily integrated into our instruction as most of the students within this class have IEP goals related to acquiring vocabulary, visualizing text, using self-monitoring strategies during reading, planning for writing, and learning basic grammatical and writing conventions. We taught mini-lessons to the entire group and provided one-on-one support as needed to address specific IEP goals. Additionally, the IEPs helped us to determine the types and lengths of sentences we should expect from each student and the reading level that we should use to craft our teacher-created clues.

Reflection

When we looked for research, we were able to find the outline for a successful process for curriculum modification. When we focused on the standards at the beginning of planning rather than starting with the IEP goals and objectives, we were able to challenge students more than we had originally thought. Going through the steps repeatedly has also allowed us to better understand curriculum development. We see how students with disabilities fit within standards-based instruction. Our goal has become about interpreting the standards in a way that allows all students to achieve at their own highest level and being able to explain this to others.

Student Name: _____

Date: _____

Mystery: Scavenger Hunt

	4	3	2	1
WEB/WRITING ORGANIZATION	Student created 5 webs with at least 4 descriptions on each web.	Student created 3-4 webs and each web has 3 descriptions.	Student created 1-2 webs and each web has 2 descriptions.	Student did not create webs to organize their plan for writing.
USE OF VOCABULARY LISTS	Student used provided vocabulary lists at all times for assistance with spelling.	Student used provided vocabulary lists most of the time for assistance with spelling.	Student used provided vocabulary lists some of the time for assistance with spelling.	Student rarely used provided vocabulary lists for assistance with spelling.
COMPLETE SENTENCES	Clues are written in complete sentences following modeled sentence structures, initial capitalization, and final punctuation in each sentence without errors.	Clues are written in complete sentences following modeled sentence structures, initial capitalization, and final punctuation in each sentence with 1-2 errors.	Clues are written in complete sentences following modeled sentence structures, initial capitalization, and final punctuation in each sentence with 3-4 errors.	Clues are written in complete sentences following modeled sentence structures, initial capitalization, and final punctuation in each sentence with 5 or more errors.
VISUALIZING	Student demonstrated active visualization by "thinking aloud" after each clue (5 out of 5).	Student demonstrated active visualization by "thinking aloud" after most clues (4 out of 5).	Student demonstrated active visualization by "thinking aloud" after some clues (2 or 3 out of 5).	Student demonstrated active visualization by "thinking aloud" after few or no clues (0-1 out of 5 clues).

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A Lesson on Mystery

By Holly McBride

Last year we set out to apply the four-step approach that we found in research from the University of Kentucky to design a unit for our language arts curriculum. We identified the appropriate standards, figured out what skills we would teach in conformance with the standards and what outcomes were expected, and we decided to develop a unit on the concept of "mystery." The instructional activities that we developed would center on the unit's culminating activity—a scavenger hunt. Here is how the unit unfolded.

1. Pre-Assessing

We began with a pre-assessment to determine what students already knew. We showed students several common images associated with mysteries (i.e., a magnifying glass, fingerprints, a picture of a detective), and we asked them to tell us what they knew about those images. We facilitated a group discussion that we documented using Writing with Symbols© software. This provided us with documentation of the students' knowledge before beginning the unit of study, as well as text that they could later read with the embedded picture support.

2. Pre-Teaching

We pre-taught essential vocabulary for the unit by creating picture-supported vocabulary handouts (see Figure 1) using Boardmaker© software and discussing the vocabulary as a group. We reviewed the vocabulary at the beginning of each class; students were expected to use the vocabulary daily, both in their writing and in their signing. This interactive process helped students develop a functional understanding and an appropriate application of each term. When a sign did not exist for some new vocabulary words, we rehearsed through repeated use of print, fingerspelling, and accompanying explanation or role playing of the concept.

Figure 1. Picture-supported vocabulary lists for our unit on mystery

3. Generating Excitement

We knew from experience that if we let students have a glimpse of the culminating project—in this case an in-school scavenger hunt—they would be better able to maintain motivation and attention for a longer period of time. We developed written clues and then videotaped the teacher reading the clues in American Sign Language. As the teacher read the clues, she modeled "thinking aloud" to develop a mental picture of the clue. The video showed her reading, thinking aloud, and following the clues to five different locations within the school. On one occasion, we included her making a mistake in order to show how she caught her own error and repaired it.

4. Teaching New Skills

We worked on learning the foundational skills that would be interwoven throughout the mystery unit. We focused heavily on visualization of text and scaffolded this experience using component skills outlined in the Visualize and Verbalize® program. We started with visualizing characters based upon word-level visualization and the use of drawings and/or acting and then increasing complexity over time:

- First, we gave the students a list of six to eight words describing a character's physical appearance and demeanor, and then we read aloud the list as a group to be sure that all of the words were recognized.
- Next, we asked students to draw a picture of the character that the vocabulary words described.
- Then we moved on to students creating their own word-level character descriptions. Each student had to come up with eight words to describe the character he or she had visualized and draw a picture of that character. Then each student had to give a partner his or her list of descriptive words (but not show his or her partner the drawing). The partner had to draw a picture of the character based on those descriptive words. Once this was done, the students showed each other their drawings and compared them.

Through this independent work and comparison, we were able to see if all the words were taken into account in each drawing, and how visualizations of a given word might look the same or be interpreted with some range of difference. For example, "brown hair" might be dark or light, long or short.

After working on the word-level character visualizations, which were relatively concrete and easily drawn/acted out, we described and visualized locations. I composed a few simple three- to five-sentence paragraphs describing a location within the school. Using picture-supported vocabulary, the students helped each other read the paragraph "aloud." I then modeled a "thinking aloud" process to guess where the location could be.

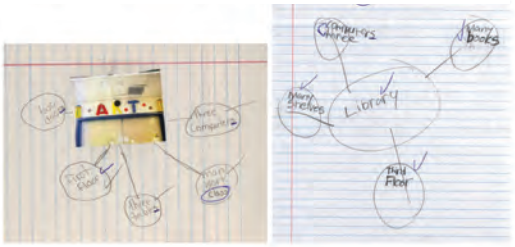
After watching me think aloud, my students and I went to the presumed location and discussed whether or not the location fit all the criteria described in the clue. If it did not, we discussed other possibilities and why our assumptions were incorrect. Going to the physical location assisted the students with matching the visualization in their mind with an actual place. It was also easier to prove or disprove our guesses in the actual environment rather than relying upon memory of the place.

5. Trying It Out

Following a few days of visualizing environments based on reading written clues, students were ready to conduct their own scavenger hunts. Each student selected a peer's name to determine for whom he or she would create a scavenger hunt. Then students selected five locations in which to hide their clues and prize. At this point, a few students clearly understood the process of making a scavenger hunt, but others were still confused. Realizing a gap in understanding had occurred, I quickly developed a checklist of the steps involved in the process. This allowed students to develop greater independence and to work individually at their own pace. It also provided a way to track data regarding sight word recognition and ability to follow directions.

6. Mini-Lessons

Figure 2. Student-created webs to organize ideas for clue writing



At the beginning of class for several days, we worked on webbing, creating simple sentences, and using editing. Each student selected his or her locations to describe; each took pictures of the locations and created a web (see Figure 2) to describe the location. Using the web, they composed simple sentences to describe the environment. We focused on two basic sentence types: "This place is _____" and "This place has _____" (see Figure 3). We also worked on subject-verb agreement, use of more varied adjectives, and editing for punctuation and capitalization.

Figure 3. Students practice sentences beginning "This place is…" and "This place has…"

7. Individual Hunters

Finally the students began their scavenger hunt using picture-supported vocabulary to read aloud the clues. They were required to state the name of the place they believed the clue referred to and to explain why they thought it was the correct place before being allowed to move to the location.

8. Extending the Lesson

We extended learning by presenting an informal activity of signing clues to our middle school students (some with disabilities and some without) at the end of our lunch period. All the students enjoyed the activity. The structured classroom practice helped our students with significant disabilities keep up with their grade-level peers. The extension allowed a skill taught in one environment to be generalized to another and reviewed and practiced in an enjoyable way.

9. Reflecting

We were very pleased with the success of this unit. Students demonstrated a good understanding of the fundamental components of mystery, and they understood visualization and its connection to what a proficient reader does.

References

Clayton, J., Burdge, M., Denham, A., Kleinert, H., & Kearns, J. (2006). A four-step process for accessing the general curriculum for students with significant cognitive disabilities. *Teaching Exceptional Children, 38*(5), 20-27.

Jitendra, A., Burgess, C., & Gajira, M. (2011). Cognitive strategy instruction for improving expository text instruction for students with learning disabilities: The quality of the evidence. *Exceptional Children, 77*(2), 135-139.

Moores, D. F., & Martin, D. S. (Eds.). (2006). Deaf learners: Developments in curriculum and instruction. Washington, DC: Gallaudet University Press.

Spencer, P., & Marschark, M. (2010). *Evidence-based practice in educating deaf and hard-of-hearing students.* New York: Oxford University Press.

Resources

Bell, N. (2007). *Visualizing and verbalizing: For language comprehension and thinking* (2nd ed.). San Luis Obispo, CA: Gander.

Ohio Department of Education. (2011). *Academic content standards: English language arts overview* [PDF document]. Retrieved July 13, 2011, from *www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDetail.aspx?Page=3&TopicRelationID=1699&Content=107240*

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THE "WHY" AND "HOW" OF AN

asl/english bimodal bilingual program

By Debra Berlin Nussbaum, Susanne Scott, and Laurene E. Simms

During the past few years, the teachers and staff at Kendall Demonstration Elementary School (KDES) have reviewed research to identify factors that positively impact language development for deaf and hard of hearing children, and established language and communication practices to reflect what we have learned. Based on the research, which details the advantages of early accessible visual language (Baker, 2011) and documents the variations in spoken language outcomes regardless of the use of hearing aids and cochlear implants (Yoshinaga-Itano, 2006), we have examined how an American Sign Language (ASL)/English bilingual program can be designed to benefit children with a wide range of characteristics—from children who have minimal access to spoken language through hearing aids and cochlear implants to those who benefit greatly from these technologies. We refer to this as an *ASL/English bimodal bilingual approach*, which includes establishment of language foundations and access to learning through two modalities, e.g., auditory and visual, and two languages, e.g., ASL and English (Berent, 2004; Bishop, 2006; Emmorey, Bornstein, & Thompson, 2005). Through our experience in establishing a bimodal bilingual program at KDES and through our consultations with schools and programs throughout the United States, we are finding that with purposeful planning this multisensory approach can be implemented to effectively support the overall development of deaf and hard of hearing children.

Photos by John T. Consoli

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Research Support for a Bimodal Bilingual Approach

For children who are deaf or hard of hearing and cannot fully access linguistic meaning through audition, the use of ASL has been documented to promote linguistic, communication, cognitive, academic, and literacy development as well as social-emotional growth and identity formation (Baker, 2011; Cummins, 2006; Grosjean, 2008; Morford & Mayberry, 2000; Yoshinaga-Itano, 2006). Evidence also indicates that there is a risk of language delay if an accessible language is not used as early as possible, even for children who have some level of access to spoken language through a hearing aid or cochlear implant (Mayberry, 1993, 2007; Mayberry & Eichen, 1991; Mayberry, Lock, & Kazmi, 2002; Schick, de Villiers, de Villiers, & Hoffmeister, 2007). The brain has the capacity to acquire both a visual and a spoken language without detriment to the development of either (Kovelman et al., 2009; Petitto et al., 2001; Petitto & Kovelman, 2003), and there is no documented evidence demonstrating that ASL inhibits the development of spoken English (Marschark & Hauser, 2012). An ASL/English bimodal bilingual approach has the characteristics to be advantageous to language acquisition and learning. The child

clinical educator in the Department of Hearing, Speech and Language Sciences. In 2003 Scott joined the Cochlear Implant Education Center, where she provides expertise in cochlear implants and ASL/English bilingual programming for professionals, students, and families at the Clerc Center and throughout the nation.

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The authors welcome questions and comments about this article at *Debra.Nussbaum@gallaudet.edu, Susanne.Scott@gallaudet.edu,* and *Laurene.Simms@gallaudet.edu,* respectively.

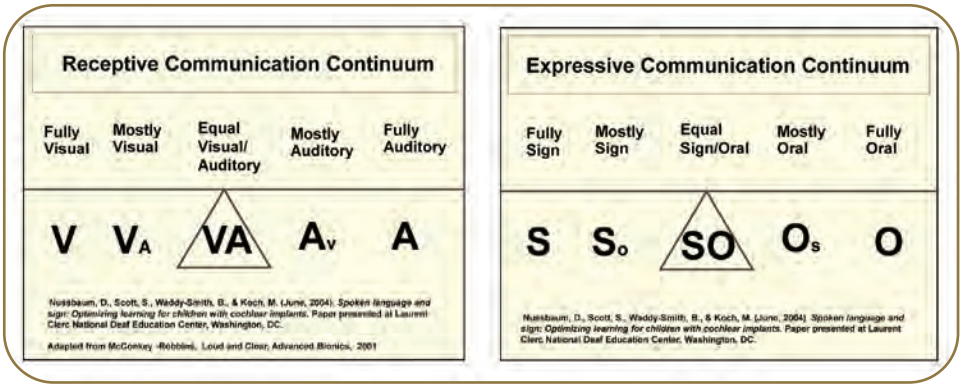


Figure 1: Continuums used at the Clerc Center to document receptive and expressive communication as part of the individualized language planning process

acquires language through his or her intact visual modality while developing spoken English to the maximum extent possible. This approach is "additive"; it builds upon a child's strength in one language while adding a second language (Baker, 2006).

Evolution of an ASL/English Bimodal Bilingual Approach

Use of a bilingual approach, which addresses the acquisition and use of both ASL and English, emerged during the 1980s. Referred to as the bilingual/bicultural ("Bi-Bi") approach, this model reflects the importance of including the language accessibility needs as well as the cultural and identity needs of deaf learners. ASL is recommended as a first language and major medium of communication, with English addressed primarily through reading and writing (Nover, 1995; Nover, Christensen, & Cheng, 1998; Reynolds & Titus, 1991; Vernon & Daigle, 1994). A framework later emerged emphasizing the development of ASL and English, including the development of spoken English commensurate with a child's potential for oral/aural development (Garate, 2011; Nover, Christensen, & Cheng, 1998). As growing numbers of children demonstrate the potential to access language and learning through audition via improved digital hearing aids and cochlear implants, increasing numbers of educational programs have moved towards designing and implementing an ASL/English bilingual program that is also bimodal.

Planning and Implementing a Bimodal Bilingual Program

The key to designing and implementing a successful bimodal bilingual program is planning (Knight & Swanwick, 2002; Nover, 2004). Regardless of whether this approach is implemented in schools for deaf students or in public or private school settings, three components are integral: school-wide planning, individualized planning, and teacher implementation planning.

School-wide planning is the first step. It is critical that the school administration define and share with the school community the school's philosophy and guiding principles surrounding the development and use of ASL and spoken and written English (Muhlke, 2000). (See sidebar on "Guiding Principles for Bilingual Planning at the Clerc Center.") An effective planning process should include teachers, staff, and families. A strategic plan to identify resources for ongoing professional development and family education and a system to monitor program effectiveness is also an important part of the process. From our experience, it has been beneficial to have a designated person(s) responsible for oversight of the school-wide planning and implementation process.

Individualized planning, the development of a language and communication plan for each child, is the second key component. The individualized plan should include the child's profile (based on informal and formal assessment) and his or her functioning in both ASL and spoken English (Easterbrooks & Baker, 2002); it should also include recommendations for individual goals to facilitate development and use of each language and a system to monitor each child's progress. (See sidebar on "Planning to Implementation: A Look at Tommy's Day.") The plan can be tailored to reflect the needs of children who:

- Are from families that are culturally deaf
- Have additional disabilities
- Are in the early language development stages
- Are beyond the early language development years
- Use and benefit from hearing aids or cochlear implants
- Do not use or benefit from hearing aids or cochlear implants

As part of the individualized planning process, the Clerc Center has developed and is utilizing a Language and Communication Profile. This profile includes a variety of tools we have chosen to document a child's language and communication characteristics and reflects a child's use of language in varied environments. One part of the profile includes a description of the child's functioning along two continuums (see Figure 1): a receptive continuum for how a child accesses language—visually, aurally, or somewhere in between; and an expressive continuum for how a child expresses language—signed, spoken, or somewhere in between (Nussbaum & Scott, 2011). As placements within these continuums are incorporated into developing an individualized plan, it is important to emphasize the following:

- How a child functions on either continuum may differ in varied settings (e.g., social settings, large classrooms, small groups, 1-1 situations, noisy environments, complicated fast-paced language situations). Language use decisions should reflect a child's needs in each of these settings.
- How a child functions in understanding ASL and spoken language may differ from how he or she functions in generating either language. For example, a child may be able to readily understand spoken language or ASL; however,

he or she may not demonstrate the ability to express him- or herself at the same level through either language.

Regardless of which assessment tools or documentation system a school uses, the individualized plan should be developed by a team of professionals working with the child, including his or her teacher, speech language specialist, audiologist, ASL specialist, etc. Gathering family input related to a child's use of language and communication in the home, as well as family goals related to the development and use of each language, is an integral part of developing the individualized plan. If professionals or specialists outside of the school are involved with the child, they should also be included in the planning process.

Teacher implementation planning, the third step in the process, should be coordinated by the child's teacher and include feedback from other support professionals and the family. It should reflect language use for each activity throughout the day, identify who will use each language to facilitate the activity, and determine how to group children with similar language and communication characteristics and goals (Swanwick & Tsverik, 2007; Garate, 2011). Part of the plan can also include recommendations for families regarding how and when to use each language in the home.

Guiding Principles for Bilingual Planning at the Clerc Center

BELIEF STATEMENT ON LANGUAGE:

We believe that early access to and acquisition of linguistic proficiency in ASL and English are integral to a deaf or hard of hearing student's overall development.

GUIDING PRINCIPLES:

- Early, unrestricted access to language is critical to linguistic and cognitive development.
- Bilingual development of ASL and English is critical to deaf and hard of hearing children establishing early communication with their parents, developing their cognitive abilities, acquiring world knowledge, communicating fully with the surrounding world, and acculturating into the world of the hearing and of the deaf. (Grosjean, 2008)
- Accessible and consistent ASL and English adult and peer language models are integral to fostering language acquisition and learning.
- Use of visual language, including ASL and a rich English print environment, is critical for access, acquisition, and development of both languages.
- Spoken English is valued, encouraged, and incorporated specific to an individual child's characteristics and goals.
- Family involvement and competence in facilitating early accessible language and communication is critical to a child's cognitive and social-emotional development.

At KDES, two of the practices used for implementing individual language and communication plans are *language immersion* and *classroom integration*:

- *Language immersion* is the targeted use of either ASL or spoken English for a dedicated period of time guided by the activity, the person facilitating the activity, and/or the place of the activity. This practice provides an opportunity for children to acquire and experience a distinct separation between ASL and spoken English (Baker, 2006). Language use during immersion activities is purposeful, meaningful, and developmentally appropriate, allowing language acquisition to proceed in a way that is natural and incidental. For example, in a preschool classroom, an art activity may be facilitated through spoken English in one area of the classroom and through ASL in another area of the classroom. Other immersion opportunities we have implemented include lunchtime, facilitated in ASL or spoken English at separate tables, and read-aloud stories, facilitated either in ASL or spoken English. For children in kindergarten through eighth grade, ASL immersion occurs via a dedicated ASL language arts class.
- *Classroom integration* is the use of ASL and English within a lesson, activity, or interaction to facilitate development of skills in ASL and spoken English. Classroom integration provides structured opportunities to address each child's individual language and communication goals. For example, while working on curriculum content in class, one group of children may be with a speech-language specialist and/or teacher to develop spoken English skills and

another group of children may be with an ASL specialist and/or teacher to develop ASL skills. Skill development in each language can also be integrated through use of learning centers (Garate, 2011).

During both immersion and integration opportunities, bilingual strategies can be used to link ASL and spoken English, including:

- *Sandwiching*—Saying it-signing it-saying it, or signing it-saying it-signing it
- *Chaining*—Signing it-fingerspelling it-using picture support-saying it

While research exists to support the bimodal bilingual approach, research has not yet formally documented student outcomes. However, at KDES we have witnessed positive outcomes in both ASL and spoken English for our students. We have also experienced the benefit to our school community, families, and students of using a language planning process that is reflective of research and driven by individualized student assessment. While a bimodal bilingual program requires dedicated planning and coordination, we are optimistic that its potential to positively impact the development of linguistic competence of deaf and hard of hearing children will offer strong motivation for educational settings to implement this approach.

Planning to Implementation: A Look at Tommy's Day

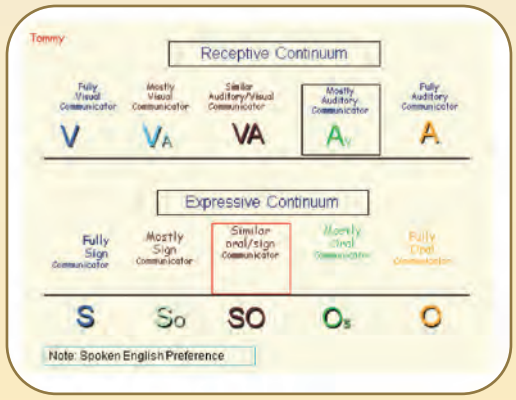
BACKGROUND: Tommy is 5 years old and enrolled in an ASL/English bilingual kindergarten class. He is one of 12 students with varying degrees of hearing levels, varied use and benefit from listening technologies (e.g., hearing aids, cochlear implants), and varied skills in ASL and spoken English. He has a teacher who is hearing and bilingual in ASL and English as well as an instructional aide who is a native ASL user.

Tommy has a bilateral, moderate to severe sensorineural hearing loss that was identified via newborn hearing screening. Tommy's parents are hearing and he has a 2-year-old sister who is also hearing. He started receiving early intervention services at 4 months of age. At that time he was fitted with digital hearing aids that he uses consistently, and his parents started learning and using ASL. The primary language of the home is spoken English; however, the family also uses ASL. Based on the results of formal and informal assessments, Tommy's language and communication functioning is as follows:

- **ASL:** Tommy understands simple, familiar information when language is context embedded and predictable. He demonstrates the emerging potential to understand and use ASL for increasingly complex new information in one-on-one or small group settings. His signing is generally understood by family members, teachers, and peers.
- **SPOKEN ENGLISH:** Tommy receives significant benefit from his hearing aids and is able to understand and use spoken English for complex new information in a variety of settings. He has few articulation errors, and his speech is generally understood by family members, teachers, and peers.

Below: A description of Tommy's individualized plan to address how and when to use ASL and spoken English.

ACTIVITY	IMPLEMENTATION PLAN
Arrival/Breakfast	Daily hearing aid check
Morning Meeting	ASL used for full class
Language Arts	Spoken English used to facilitate activities; Tommy grouped with peers having similar access and skills for spoken English
Math	ASL used for full class
Lunch	Spoken English used at lunch table; Tommy grouped with peers having similar access and skills for spoken English
ASL Language Arts	ASL immersion* *ASL taught as a content class
Social Studies/Science	ASL integration*: 2x a week Spoken English integration*: 2x a week *Skill development in each language using classroom content
Additional Supports	Spoken language habilitation services: 2x a week for 30 minutes. Family ASL class once a week Development of a family plan for language use in the home



Communication Continuum:

Tommy's primary language for communication in most situations is spoken English; however, he is comfortable using ASL with his peers and for specific class activities. On the receptive continuum Tommy is rated "Av," indicating that he primarily accesses information through listening but benefits from visual clarification through signs in noisy situations or when content is unfamiliar. Expressively he is rated "SO," suggesting that he has equal ability to use spoken language and ASL.

References

Baker, C. (2006). *Foundations of bilingual education and bilingualism* (4th ed.). Clevedon, England: Multilingual Matters.

Baker, S. (2011). *Advantages of early visual language*. Available from the Visual Language & Visual Learning website, *http://vl2.gallaudet.edu/assets/section7/document104.pdf*

Berent, G. P. (2004). Sign language-spoken language bilingualism: Code mixing and mode mixing by ASL-English bilinguals. In W. C. Ritchie & T. K. Bhatia (Eds.), *The handbook of bilingualism* (pp. 312-335). San Diego, CA: Academic Press.

Bishop, M. (2006). *Bimodal bilingualism in hearing, native users of American Sign Language*. Unpublished dissertation, Gallaudet University, Washington, D.C.

Cummins, J. (2006). *The relationship between American Sign Language proficiency and English academic development: A review of the research*. Unpublished paper for the Ontario Association of the Deaf, Toronto, Ontario, Canada.

Easterbrooks, S., & Baker, S. (2002). *Language learning in children who are deaf and hard of hearing: Multiple pathways*. Boston: Allyn and Bacon.

Emmorey, K., Bornstein, H. B., & Thompson, R. (2005). Bimodal bilingualism: Code-blending between spoken English and American Sign Language. In J. Cohen, K. T. McAlister, K. Rolstad, & J. MacSwan (Eds.), *ISB4: Proceedings of the 4th international symposium on bilingualism* (pp. 663-673). Somerville, MA: Cascadilla Press.

Garate, M. (2011). Educating children with cochlear implants in an ASL/English bilingual classroom. In R. Paludneviciene & I. Leigh (Eds.), *Cochlear implants evolving perspectives* (pp. 206-228). Washington, DC: Gallaudet University Press.

Grosjean, F. (2008). *Studying bilinguals*. New York: Oxford University Press.

Knight, P., & Swanwick, R. (2002). *Working with deaf pupils: Sign bilingual policy into practice*. London: David Fulton.

Kovelman, I., Shalinsky, M. H., White, K. S., Schmitt, S. N., Berens, M. S., Paymer, N., et al. (2009). Dual language use in sign-speech bimodal bilinguals: fNIRS brain-imaging evidence. *Brain & Language, 109*, 112-123. doi: 10.1016/j.bandl.2008.09.008

Marschark, M., & Hauser, P. (2012). *How deaf children learn: What parents and teachers need to know*. New York: Oxford University Press.

Mayberry, R. I. (1993). First-language acquisition after childhood differs from second-language acquisition: The case of American Sign Language. *Journal of Speech & Hearing Research, 36*(6), 1258-1270.

Mayberry, R. I. (2007). When timing is everything: Age of first-language acquisition effects on second-language learning. *Applied Psycholinguistics, 28*(3), 537-549. doi: 10.1017/S0142716407070294

Mayberry, R. I., & Eichen, E. B. (1991). The long-lasting advantage of learning sign language in childhood: Another look at the critical period for language acquisition. *Journal of Memory and Language, 30*(4), 486-512. doi: 10.1016/0749-596X(91)90018-F

Mayberry, R. I., Lock, E., & Kazmi, H. (2002). Linguistic ability and early language exposure. *Nature, 417*(6884), 38. doi:10.1038/417038a

Morford, J. P., & Mayberry, R. I. (2000). A reexamination of "early exposure" and its implications for language acquisition by eye. In C. Chamberlain, J. Morford, & R. Mayberry (Eds.), *Language acquisition by eye* (pp. 111-127). Mahwah, NJ: Lawrence Erlbaum.

Muhlke, M. (2000, Winter). The right to language and linguistic development: Deafness from a human rights perspective. *Virginia Journal of International Law, 40*, 705-760.

Nover, S. (1995). Politics and language: American Sign Language and English in deaf education. In C. Lucas (Ed.), *Sociolinguistics in deaf communities* (pp. 109-163). Washington, DC: Gallaudet University Press.

Nover, S. M. (2004). *A theoretical framework for language planning in ASL/English bilingual education*. Manuscript in preparation.

Nover, S. M., Christensen, K. M., & Cheng, L. L. (1998). Development of ASL and English competence for learners who are deaf. *Topics in Language Disorders, 18*(4), 61-72.

Nussbaum, D., & Scott, S. (2011). The Cochlear Implant Education Center: Perspectives on effective educational practices. In R. Paludneviciene & I. Leigh (Eds.), *Cochlear implants evolving perspectives* (pp.175-205). Washington, DC: Gallaudet University Press.

Petitto, L. A., Katerelos, M., Levy, B. G., Gauna, K., Tetreault, K., & Ferraro, V. (2001). Bilingual signed and spoken language acquisition from birth: Implications for the mechanisms underlying early bilingual language acquisition. *Journal of Child Language, 28*, 453-496.

Petitto, L. A., & Kovelman, I. (2003). The bilingual paradox: How signing-speaking bilingual children help us resolve bilingual issues and teach us about the brain's mechanisms underlying all language acquisition. *Learning Languages, 8*, 5-18.

Reynolds, D., & Titus, A. (1991). *Bilingual/bicultural education: Constructing a model for change*. Paper presented at the 55th Biennium Meeting of the Convention of American Instructors of the Deaf, New Orleans, Louisiana.

Schick, B., de Villiers, J., de Villiers, P., & Hoffmeister, R. (2007). Language and theory of mind: A study of deaf children. *Child Development, 78*(2), 376-396.

Swanwick, R., & Tsverik, I. (2007). The role of sign language for deaf children with cochlear implants: Good practice in sign bilingual settings. *Deafness and Education International, 9*(4), 214-231.

Vernon, M., & Daigle, B. (1994). Bilingual and bicultural education. In M. Garretson (Ed.), *Deaf American monograph, 44* (pp. 121-126). Silver Spring, MD: National Association of the Deaf.

Yoshinaga-Itano, C. (2006). Early identification, communication modality, and the development of speech and spoken language skills: Patterns and considerations. In P. E. Spencer & M. Marschark (Eds.), *Advances in the spoken language development of deaf and hard-of-hearing children* (pp. 298-327). New York: Oxford University Press.

an issue of learning

the effect of visual split attention in classes for

DEAF AND HARD OF HEARING STUDENTS

By Susan M. Mather and M. Diane Clark

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A deaf or hard of hearing student sits in class surrounded mostly by hearing classmates. The teacher passes out an explanatory handout showing how to divide by negative numbers, or the fading of Roman civilization, or the schedule for an upcoming field trip. While the papers slide from hand to hand, the teacher clutches her own copy and talks. The interpreter stands or sits to the left, or the right, or at the far edge of the room.

The teacher discusses the handout, the information on the board, and his or her own knowledge of the subject. The interpreter translates. Perhaps a student asks a question. Perhaps still another student makes a comment. The deaf and hard of hearing students watch—a slight time delay meaning that they are always a little behind their classmates. However, this is not their biggest problem. More problematic are the teacher, the handout, the interpreter, the information on the board, and their vocal classmates who explore the subject matter using both hearing and vision, both sensory channels bringing information to each young "hearing" brain for effortless processing. In contrast, the deaf and hard of hearing students, relying primarily on the single channel of vision, experience cognitive overload.

One of the ongoing challenges teachers of students who are deaf or hard of hearing face is managing the visual split attention implicit in multimedia learning. When a teacher presents various types of visual information at the same time, visual learners have no choice but to divide their attention among those materials and the teacher and interpreter who present the material. These situations may not allow students to separate visual input meaningfully and to effectively learn the material.

In contrast to hearing students who use dual channels—auditory and visual—for the input of classroom information, deaf and hard of hearing students tend to rely primarily on a single channel—the visual channel. Using this channel, they process

Photos by John T. Consoli

Video clip captures by Wei Wang/courtesy of Susan M. Mather

all the information that arrives not only in the classroom but also throughout their daily lives. This situation then requires splitting visual attention between visual linguistic information (in the form of sign language or lipreading), visual instructional materials, and sometimes the interpreted comments of hearing peers. If these activities are not integrated, deaf and hard of hearing children experience an increase in the cognitive load required as they shift their visual attention from an instructor to the materials (see Figure 1). This splitting of attention can adversely affect their classroom performance.

Teachers must understand that for many learners who are deaf or hard of hearing, visual learning is a stand-alone input model, and traditional classrooms have historically focused on learners who can take in information both visually and auditorily.

A Study of the Visual Looking at Deaf Students in "Auditory-oriented" Classes

Mather (2005) used an ethnographic approach to investigate the differences between auditory- and visually oriented classrooms. Here, *auditory-oriented classrooms* were defined as classrooms where the primary mode of communication was speaking and listening, and if eye contact occurred, it existed between the teacher and the individual students. In contrast, *visually oriented classrooms* were defined as settings where the primary mode of communication was sign language and lipreading, which required continuous eye contact not only between the instructor and the students but also among all students in the classroom.

Within these two environments, class management and turn-taking mechanisms differed. In an auditory-oriented classroom, instructors could identify more than one voice at a time and the students were able to recognize the change in speaker and switch attention. In contrast, instructors of deaf and hard of hearing students could not allow more than one student to answer at a time, as direct eye contact was necessary between the instructor and the responding student as well as among the other students who shifted attention from the instructor to the student who was responding. Understanding the deaf and hard of hearing students' reliance on the visual system,

instructors helped members of the class to shift their eye gaze to the responding student. This process necessarily slows the pace of turn taking in classrooms involving deaf or hard of hearing students and requires different physical layouts, rules, and procedures.

Auditory-oriented classrooms are traditionally rectangular in shape, whereas visually oriented classrooms are typically square. The seating arrangements for auditory-oriented classrooms usually comprise several rows facing the front of the classroom, seating as many as 30 students. However, visually oriented classrooms have a more limited capacity, and the seating is arranged in a semicircle so that visual contact can be made with each person in the room.

Mather (2005) found that for deaf and hard of hearing students to participate effectively in class, whether auditory-oriented or visually oriented, students need to have access to a 360-degree view of the classroom. Accordingly, once a deaf or hard of hearing student enters a classroom, the instructor should make classroom accommodations to achieve the 360-degree view. For instance, in an interpreted class of 35 to 40 students, the instructor should use the U-or V-shape seating arrangement so that the deaf or hard of hearing student can have sight lines to the instructor, the interpreter, and his or her peers. If the

Attention-getting Behaviors in Visually Versus Auditory-oriented Classrooms

The burden of deaf and hard of hearing students dividing their attention to incorporate visual input into an auditory-oriented class can be lessened by using some well-designed instructional strategies as outlined below.

LANGUAGE PATTERN	VISUALLY ORIENTED CLASSROOM	AUDITORY-ORIENTED CLASSROOM
Getting Attention		
Before the class instruction starts	Getting each of the students visually ready	Announcing the subject material audibly and beginning class simultaneously
To get an individual student's attention	Individual eye gaze and visual/tactile summons (e.g., tapping shoulder, waving hand, asking another student to call the student)	Calling a student's name
To get a group's attention	Group-indicating gaze and visual/tactile summons	Vocal regulators (e.g., cues such as "um" or "okay")
Teacher's question-asking period		
Pace of questioning and answering	Overlap discouraged	Overlap at teacher's discretion
Number of students' answers	One at a time	As many as four students at various times
Recognizing who is answering	Visual recognition (e.g., hand raising)	Vocal recognition
Question patterns	Non-grammatical question markers (e.g., lower brows indicating a wh-question marker or raised brows indicating a yes/no question marker)	Vocal inflection indicating a yes/no or wh-question

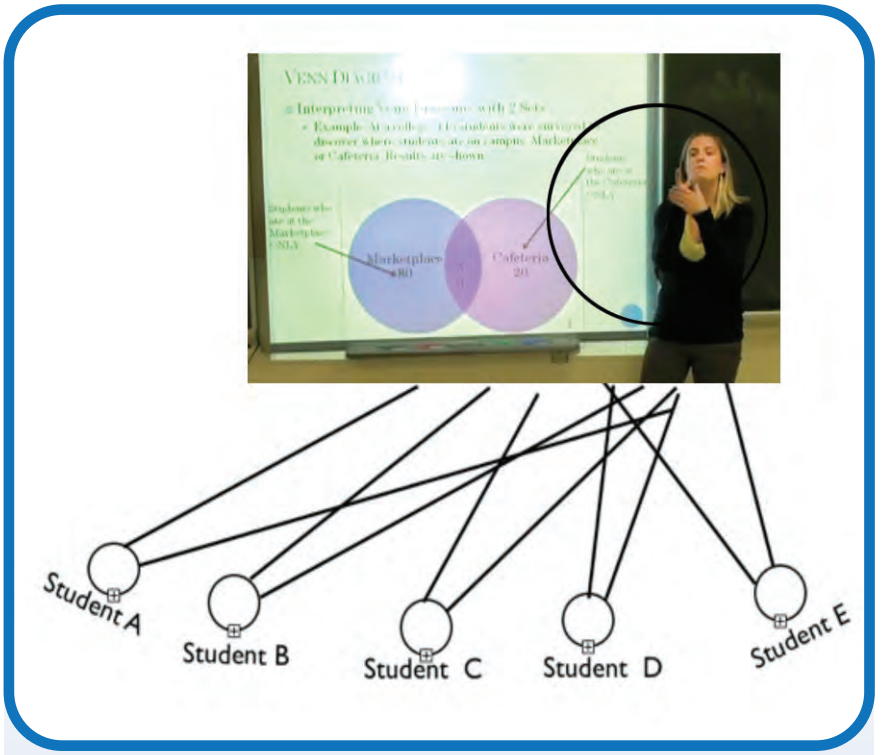


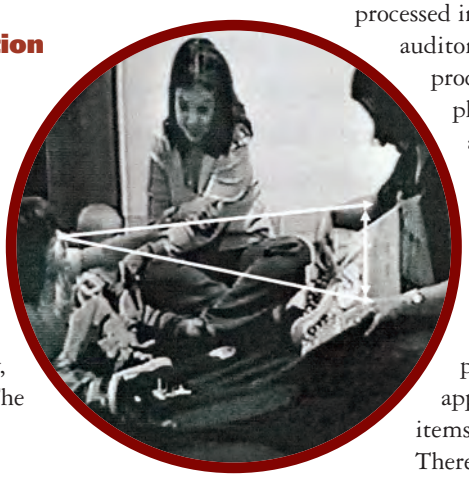
Figure 1. Signing and Board Work are Not Integrated

When signing and board work are not integrated, students must constantly shift their gaze from the instructor—who is supplying information through signing—to the information on the board.

deaf or hard of hearing student sits in the front row, he or she is unable to view his or her peers during classroom discussion and most likely will be unable to participate in these discussions.

Splitting Attention
The Effect on Memory

These issues—classroom design and the nature of a single channel for visual input—have theoretical implications related to attention, memory, and cognitive load. The impact of having one channel—the visual system—impacts cognitive load regardless of classroom design. Models of working memory include three basic assumptions: dual channels, each with limited capacity, and active processing to maintain the information. Dual channels present separate input for both auditory and visual information (Baddeley, 1998; Paivio, 1986) that are processed in parallel. Here, the auditory input is processed in a phonological buffer and the visual information is processed with a visual sketchpad. This phonological buffer has a limited capacity for processing approximately seven items (Miller, 1956). There is active verbal processing or rehearsal (e.g., repeating the information to oneself) that helps to "refresh the buffer" and maintain the information in working memory (Jonides, Lacey, & Nee, 2005).



Above: Here, a mother integrates her signing with the picture in the book to enable her child's visual access to both simultaneously. (Rodriguez-Fraticelli, 2001)

Instructional design can inadvertently increase cognitive load (Chandler & Sweller, 1992). For example, in an investigation of split attention in situations where hearing students shifted visual attention between looking at an animation and reading the on-screen text, Sweller (1999) found that having input from two different sources in the same channel increased cognitive load. Additionally, Moreno and Mayer (1999) found that students learned better when an instructor used both audio and video instruction simultaneously, in contrast to having the student read text while viewing a visual display. In other words, when hearing students were presented with two sources of sensory input, they were able to learn better than average if one source was visual while the other was auditory; however, they learned less than average if both of the sources of input were visual. What is the impact of this finding for many deaf and hard of hearing learners who do not use dual channels?

An Intervention
Attending to the Visual

Mather, Rodriguez, and Andrews (2006) noticed that deaf parents of pre-school deaf children would adjust their signing space to enable their children's visual access to their signing and the picture at the same time. Parents would also integrate their signing into the pictures, sometimes signing directly on the pages of the book. (See illustration at left.)

Visual access can be thought of as establishing an accessible cone triangle (formerly called a sight triangle), i.e., the individual watching, the teacher or interpreter signing, and the classroom material or learning prop. Mather (2009) found that not every student shared the same cone triangle; this varied on where he or she sat.

Mather (2009) set up several five-day courses for high school and college instructors from different fields (e.g.,

math, biology, geography, English) and educational interpreters who wished to improve their teaching skills. The first two half-days, she explained the differences between auditory- and visually based classrooms. On the third day, teachers learned how to use visually based strategies, such as purposeful eye gaze, visual readiness, attention-getting strategies, and maintaining classroom discussion during hands-on activities. Mather also discussed various theories of working memory, cognitive overload, and the effects of split attention. She explained the importance of ensuring each student had a clear cone triangle and visual access to the instructor and classroom materials (see Figure 2). On the fourth day, each instructor became a lecturer, using props such as PowerPoint or 3-D objects while the rest of the instructors, in the role of students, watched and gave feedback. On the fifth day, the instructors were able to integrate their signing along with props more effectively.

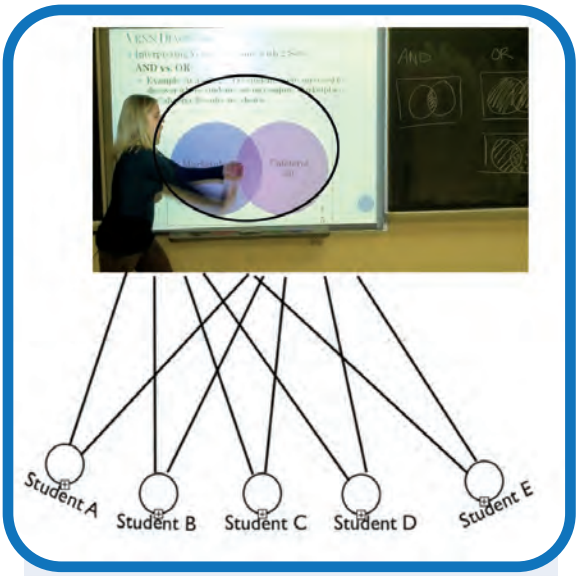


Figure 2. Integrating Signing and Board Work

The students above (except for A and E) have a full view of both the instructor and the information on the board. The instructor has moved her body and integrated her signing into the visual display. For the deaf and hard of hearing students, fewer shifts of attention are required.

Deaf and hard of hearing individuals who are mainstreamed generally struggle to achieve academic parity with their hearing peers (Marschark & Hauser, 2008). These lower levels of academic achievement may be related to the nature of auditory-based classrooms. Unfortunately the auditory-based classroom—the traditional class model—unfairly increases the cognitive load for deaf and hard of hearing students by requiring them to constantly engage in splitting their visual attention. This split attention overloads working memory. Recognizing this and incorporating some visually based learning strategies could go a long way towards eliminating traditionally low levels of academic achievement for deaf and hard of hearing students.

References

Baddeley, A. (1998). *Human memory*. Boston: Allyn & Bacon.

Chandler, P., & Sweller, J. (1992). The split-attention effect as a factor in the design of instruction. *British Journal of Educational Psychology, 62*, 233-246.

Jonides, J., Lacey, S. C., & Nee, D. E. (2005). Processes of working memory in mind and brain. *Current Directions in Psychological Science. 14*, 2-5.

Marschark, M., & Hauser, P. C. (Eds.). (2008). *Deaf cognition: Foundations and outcomes*. New York: Oxford University Press.

Mather, S. M. (2005). Ethnographic research on the use of visually based regulators for teachers and interpreters. In M. Metzger & E. Fleetwood (Ed.), *Attitudes, innuendo, and regulators: Challenges of interpretation* (pp. 136-161). Washington, DC: Gallaudet University Press.

Mather, S. M. (2009, March 4). *Classroom discourse: The uses of integrated signs and props in the visually based classroom*. VL2 presentation, Gallaudet University, Washington, D. C.

Mather, S., Rodriguez, Y., and & Andrews, J. (2006). Establishing and maintaining sight triangles: Conversations between deaf parents and hearing toddlers in Puerto Rico. In C. Lucas (Ed.), *Multilingualism and sign languages: From the Great Plains to Australia* (pp. 159). Washington, DC: Gallaudet University Press.

Miller, G. A. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychological Review, 63*(2), 343-355.

Moreno, R., & Mayer, R. E. (1999). Cognitive principles of multimedia learning: The role of modality and contiguity. *Journal of Educational Psychology, 91*, 358-368.

Paivio, A. (1986). Mental representations: *A dual coding approach*. Oxford, England: Oxford University Press.

Rodriguez-Fraticelli, Y. (2001). *Toddlerese: Conversations between deaf parents and their hearing toddlers in Puerto Rico.* Doctoral dissertation, Lamar University, Beaumont, Texas.

Sweller, J. (1999). *Instructional design in technical areas*. Camberwell, Australia: ACER Press.

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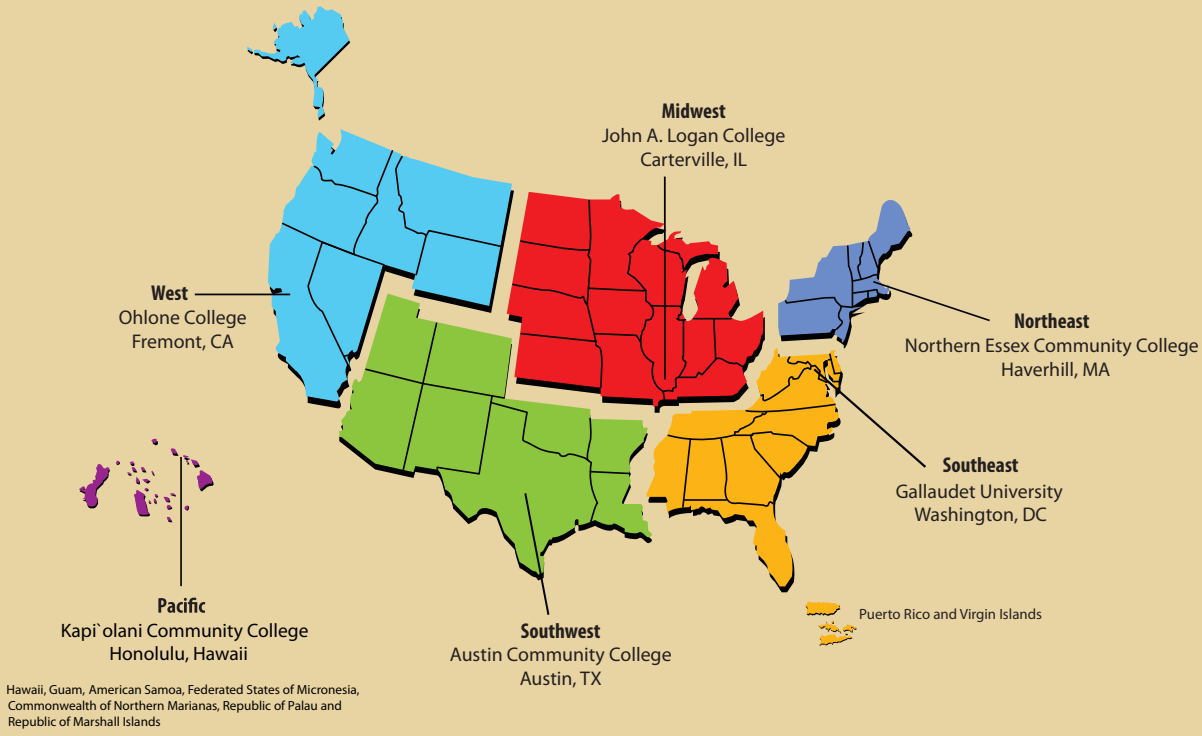

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MANAGING BEHAVIOR BY MANAGING THE CLASSROOM:

MAKING LEARNING ACCESSIBLE FOR DEAF AND HARD OF HEARING STUDENTS WITH

autism spectrum disorders

By Christen A. Szymanski

Christen A. Szymanski, PhD, is the director of Research and Evaluation at the Laurent Clerc National Deaf Education Center at Gallaudet University. She received her bachelor's degree in psychology and deaf studies from Western Maryland College (now McDaniel College) and her doctoral degree in clinical psychology from Gallaudet University. She has extensive experience in clinics, recreation centers, and schools throughout the country; she has worked with children—deaf, hard of hearing, and hearing—who have developmental disabilities, Autism Spectrum Disorders, challenging behaviors, and intellectual disabilities. Szymanski welcomes questions and comments about this article at *Christen.Szymanski@gallaudet.edu.*

The prevalence of Autism Spectrum Disorders (ASD)—a group of developmental disabilities that cause severe problems with socialization, behavior, and communication—continues to grow. In 2008, the year that *Odyssey* focused on autism, the estimated prevalence of ASD for hearing children was 1 in 150 (CDC, 2007), while today estimates suggest rates as high as 1 in 91 (Kogan et al., 2009). This increase has also been observed in children who are deaf or hard of hearing (Szymanski, Brice, Lam, & Hotto, 2012), with numbers growing from 1 in 81 (GRI, 2008) to 1 in 59 (GRI, 2010). However, in contrast to the surge in research, resources, and information available for hearing children with ASD, information to help parents, educators, and professionals working with children who are deaf or hard of hearing and have ASD continues to be scarce and often nonexistent.

While ASD is considered the same as autism under the Individuals with Disabilities Education Act, it can actually be any of the following: autism, Asperger's syndrome, or Pervasive Developmental Disorder Not Otherwise Specified. ASD is considered a developmental disability that impacts a child and his or her family throughout their lives. Like children with autism, children with ASD struggle in their ability to socialize and interact with others, express themselves or communicate effectively, and regulate behaviors or emotional reactions. Despite common characteristics across the autism spectrum, no two children or adults with autism or ASD are alike.

Currently, there is no cure for ASD. However, with the right interventions children and adults do exhibit gains and can make marked improvements. The controversy about the cause of ASD continues and is still being debated. What is certain is that vaccines *do not* cause autism (DeStefano, 2007); instead research continues to implicate genetics.

Challenging Behaviors Lead to Challenges in Learning

At times, children with ASD display challenging behaviors. Challenging behaviors can include temper tantrums, screaming, refusing to participate in activities, and, occasionally, aggression towards others or a tendency towards self-injury. When these behaviors begin, it is crucial that schools immediately respond by conducting a Functional Behavioral Assessment (FBA). An FBA by a trained professional allows for an understanding of what may be causal in the child's

Photos courtesy of Christen A. Szymanski

Above: When classrooms have items that the child with ASD is especially interested in or focused on, it is difficult to redirect him or her to tasks. Conceal these items or provide limited access.

behavior as well as ideas on how to eliminate that cause before behaviors escalate.

The following strategies and interventions have been effective in designing a classroom environment that allows children with ASD to be successful. Many of these strategies correlate with a reduction of challenging and problem behaviors.

Minimizing Complex Language

Children with ASD face significant struggles with understanding and using language to communicate (Hurdy et al., 2010). This challenge is likely further exacerbated when the child is deaf or hard of hearing because like other deaf or hard of hearing children, children with hearing loss who have ASD may have limited exposure to language due to age of diagnosis of hearing loss, access to use and understanding of spoken or signed language, and consistency of language use between home and school (Szymanski & Brice, 2008; Szymanski, Brice, Lam, & Hotto, 2012).

Language in the classroom is a way for teachers and staff to communicate activities, excitement, changes in routines, upcoming events, expectations, and consequences. Children with ASD often cannot access this information (Moreno & O'Neal, 1997) because they struggle both to pick up on those cues and to know when they have missed them. To minimize the effect of deficits in receptive language, teachers are encouraged to try to convey the most information possible using the fewest words possible. Brief statements (e.g., "Sit here.") are more effective than lengthy ones (e.g., "I would like you to please sit over here."). Brief statements reduce the amount of receptive language skills the child with ASD needs to understand. Using a combination of minimal language and pictures, gestures, and other cues may improve the child's ability to follow and act on instructions and expectations. Here are some tips for keeping language simple:

- Be brief.
- Be concrete.
- Be consistent with word choice and phrases. Use the same sign or gesture often.
- Be direct. Use a gesture to indicate where you want the child to sit or stand. Don't say, "Find a seat." Instead, say, "Sit here" and point to the location. Children with ASD often struggle to comprehend language and to understand which seat they should find.
- Use visual support. Combine complex tasks with pictures,

gestures, and body language. When telling a child, "Give me the ball," add a gesture that shows him or her how to hand it to you, or hold out your hand and wait for the ball.

Making the Classroom Visually Accessible

While research suggests that children with autism and ASD are visual learners (Dunn Buron & Wolfberg, 2008) research also shows that children with ASD are very easily distracted (Happe, Booth, Charlton, & Hughes, 2006). Classrooms that are most efficient for children with ASD are those that combine visual cues, e.g., schedules, class rules, while minimizing visual distracters, e.g., extra word charts, ABC strips, pictures, computers, toys (Smith, 2012; Rogers & Dawson, 2010; Lord & McGee, 2001). When classrooms have too many visuals, children with ASD may become overwhelmed, and they may fixate on these items rather than on instructional materials; they may not be able to focus on important tasks.

Research also shows that children with autism struggle to remember information that is not of interest to them (Williams, 1995). For example, a child with autism may know the Metro train schedule but may not know his or her phone number. This can lead to significant challenges in school with remembering classroom rules, meeting expectations, understanding how to complete tasks, and essentially knowing how to be a student. This information, so basic to classmates, may not be important to a child with ASD. To minimize this deficit, teachers are encouraged to incorporate both spoken and signed expectations as well as visual information whenever possible.

Teachers who post rules and expectations and review them frequently are most likely to succeed (Smith, 2012; Dunn Buron & Wolfberg, 2008; Loring & Hamilton, 2011). Visual reminders or posters that are helpful include those focused on classroom rules, job charts, schedules, and classroom expectations. Having this information visually accessible allows a teacher to refer a child to a visual reminder rather than rely on a child's weak receptive language skills (Loring & Hamilton, 2011).

Tips for Making the Classroom Accessible

- Conceal toys, materials, and other items of high interest (e.g., blocks, computers, puzzles) to eliminate distractions and potentially challenging behaviors.
- Keep visual reminders and postings available and easy to reference. Combine pictures and words where appropriate. Keep things clear and concise.
- Utilize all communication modalities (e.g., signed language; spoken language; pictures; gestures, including pointing).
- Post rules and expectations. Children cannot argue with a posting on a wall, but they can argue with you.
- Keep classrooms organized, with areas clearly labeled and designated for specific items. Use pictures and words to label important areas. Areas that are off limits (e.g., the teacher's desk) should be clearly labeled "No students."
- Use 5-point scales or other similar scales to help visually present expectations for behavior and emotions (Dunn Buron, 2003). Visually presenting expectations eliminates receptive language challenges.

Establishing Routines

Learning how to be a student may be a challenge for students with ASD. Students without ASD incorporate communication from their teacher and peers as well as the subtle cues of the classroom seemingly naturally (Moreno & O'Neal, 1997). Children with ASD often do not have these skills and may exhibit challenging behaviors until they learn how to be students.

This learning often occurs by establishing frequent routines during the school day (Kashinath, Woods, & Goldstein, 2006; Smith, 2012; Marks et al., 2003). When children with ASD have a routine that they know and have mastered, frustrations from trying to understand their environment (e.g., language or cues from the teacher) may be minimized and challenging behaviors

reduced. Research also shows that when routines are learned in one setting they can be generalized to other settings, so learning table manners at school results in using table manners at home (Kashinath, Woods, & Goldstein, 2006). Routines essential in classrooms may include a structured morning arrival, calendar or circle time, lining up, lunch time, recess, group work, and packing

up to go home (Marks et al., 2003; Smith 2012). It is important to keep in mind that routines should not turn into rituals, which can often be negative for children with autism (Smith, 2012; Lord & McGee, 2001).

Routines reduce stress and anxiety and enable students to feel as if they are in control (Dunn Buron & Wolfberg, 2008; Kashinath, Woods, & Goldstein, 2006). Without routines throughout the day, students with ASD are likely to face failure and, like others facing failure, get upset—and being upset can result in challenging classroom behaviors.

Tips for Establishing Routines

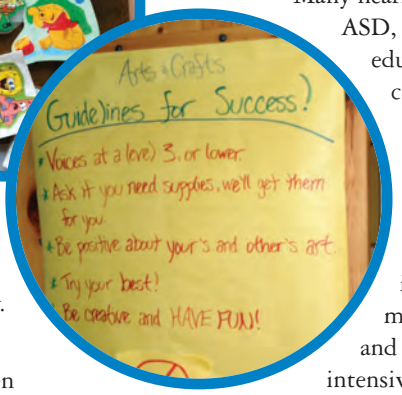
- Whenever possible, routines should be the same for all children in the classroom.
- Individualize routines, but keep expectations the same.
- Make sure all pertinent adults—including substitute teachers and staff members—are aware of classroom routines.
- Minimize changes. When changes to routines occur, children with autism often display challenging behaviors.
- Begin with establishing small routines (e.g., lining up) and work towards larger routines (e.g., calendar time).
- When possible, establish routines at school that are similar to those at home (e.g., meal times).
- Encourage independence. Avoid over-helping the child complete tasks that are developmentally appropriate. Instead, reward the child when he or she completes tasks.
- Ensure routines are developmentally appropriate and take into account the child's strengths and weaknesses.

Individualized Schedules

Like routines, schedules allow the child to understand the cues of school that he or she misses; schedules can lead to improved behavior, generalization of skills, and feelings of competence (Smith, 2012; Lord & McGee, 2001; Bryan & Gast, 2000; Mesibov, Browder, & Kirkland, 2002). Schedules should outline the day for the child and include all critical activities (e.g., arriving, snack time, circle time, play time, nap time, group work). Schedules should be individualized for each child and take into account his or her strengths and weaknesses (Bryan & Gast, 2000). Generalizability in understanding schedules may occur best when using pictures that accurately represent an activity or item, but the image should be non-specific. For example, when some children with ASD see pictures of SunChips® or M&M's® to represent snack time, they may become upset if snack time does not include these items. For these children, more generalized pictures such as those found on image programs (e.g., Boardmaker®) might be appropriate. Research shows that when children are prompted to check their schedule often and are responsible for removing or checking off activities as they complete them, they are more likely to internalize the schedule and become independent in using it as well as master skills (Mesibov, Browder, & Kirkland, 2002; Bryan & Gast, 2000). Additionally, the use of schedules may assist students in learning the conceptual understandings of *start* and *finish*, *first* and *then*, and *next* and *last*. If students cannot manage an all-day schedule, a briefer version, such as one that shows *first* and *then* (see *www.autismspeaks.org/docs/sciencedocs/atn/visual_supports.pdf*), can be used.

Tips for Individualized Schedules

- Do not be overly specific (e.g., do not state "PE with Mr. Jon" because one day Mr. Jon will be absent and Ms. Dani will be the teacher, and this could create confusion and ultimately disruptive behavior).
- Do not force younger children to adhere to schedules with strict time lines (e.g., circle time at 9:30 a.m.) as elementary classrooms often do not adhere to strict time schedules.
- Do not use developmentally inappropriate schedules. Schedules should reflect the children's abilities. An evolution from picture schedules, to words and pictures, to words only, and ultimately to use of an agenda book would be a logical progression for children.
- Do not allow children to rearrange their schedules (e.g., put a preferred activity before a less favored activity) without permission.



Left: A reinforcement board allows a child to work towards a bigger goal (e.g., a walk, swing, access to a favorite toy) by requiring mini-goals. Stickers allow a visual representation for the child to know when he or she is getting close to a reward.

- Do keep schedules in the same location and be sure to update them daily.
- Do prompt children to check their schedules often during the day.
- Do allow portability for schedules when necessary by placing them on a clip board or using Velcro to post them.

Individualized Instruction

Decisions about curriculum interventions and design for children with hearing loss and ASD are just emerging. We are faced with a lack of trained professionals and accessible resources, making any model selection a question of the ability to implement the intervention or curriculum successfully as well as the basic question of whether the intervention is appropriate. Until we have those trained professionals, we are left in a constant cycle of wondering if what we are doing is correct.

Research, however, is clear that when children with ASD are educated in classrooms that rely heavily on group work or on their ability to internalize the cues of the classroom, they do not progress academically and may exhibit challenging behavior. Currently, the only evidence-based practice for children with ASD is Applied Behavioral Analysis, the strategy of combining structured learning with structured rewards, and intensive data collection. Applied Behavioral Analysis has been shown to improve socialization, behavior, academics, language, and communication skills in children with ASD at home and in the classroom.

Many hearing children with ASD, even when educated in classrooms for only those with ASD, may need one-to-one aids to help with curriculum instruction, manage behaviors, and provide the intensive support needed during the day.

While we may not have a large body of research on deaf and hard of hearing children with ASD, we do have several effective interventions and strategies to address classroom behavioral challenges based on research with hearing children with ASD (Smith, 2012, Lord & McGee, 2001; Dunn Buron & Wolfberg, 2008). We have anecdotal evidence that a few deaf children using similar strategies have experienced success as well. When we interpret and use existing knowledge and combine that with our expertise in educating children with hearing loss, we begin to provide the best educational environment for children who are deaf or hard of hearing with ASD.

Classroom Strategies

- Towards the end of all activities, give five- and one-minute warnings that they will soon be finished, especially if the activity is something the child enjoys (Dunn Buron & Wolfberg, 2008).
- Keep routines consistent for the child, minimize changes, and make sure all teachers and staff members are aware of the routine.
- Consider having a Change Board (a designated place in the classroom to post upcoming changes to the schedule) in the classroom for older students. This board should be updated by the teacher, and the child should be prompted to look at the changes for the day. If problem behaviors occur, the teacher can clearly state that the changes were on the board.
- Post schedules and expectations to reduce power struggles.
- Provide a space in the classroom that is completely free of all stimuli. Children with ASD are easily overwhelmed and may need time without any external distractions to calm themselves.
- Communicate daily with parents. Tell the parents about their child's challenges *and* successes in school. Facilitate the parent communicating events that may impact their child's school performance (e.g., lack of sleep, change in diet, new medication).
- Incorporate rewards throughout the day for positive behaviors. Have options available and allow the child to pick. Monitor access to items that are overly reinforcing and could lead to challenges when removed. Seek feedback from parents about new interests, and make those interests work in the classroom.
- Keep track of data related to any challenging behaviors whenever possible. Be explicit when documenting what occurred before the behavior (antecedent), during the behavior (exactly what the child did), and after the behavior (consequence).
- Use a three-step prompting sequence when making demands. Tell the child, show the child, and then assist the child in completing a task. Provide rewards when the child independently completes a task.

References

Bryan, L., & Gast, D. (2000). Teaching on-task and on-schedule behaviors to high functioning children with autism via picture activity schedules. *Journal of Autism and Developmental Disorders, 30*, 553-567.

Centers for Disease Control and Prevention. (2007, February 9). Prevalence of Autism Spectrum Disorder—Autism and developmental disabilities monitoring network, 14 sites, United States, 2002. *Morbidity and Mortality Weekly Report Surveillance Summaries, 56*, 12-27.

DeStefano, F. (2007, December). Vaccines and autism: Evidence does not support a causal association. *Clinical Pharmacology & Therapeutics, 82*, 756-759.

Dunn Buron, K. (2003). *The incredible 5-point scale: Assisting students with autism spectrum disorders in understanding social interactions and controlling their emotional response*. Shawnee Mission, KS: Autism Asperger Publishing Company.

Dunn Buron, K., & Wolfberg, P. J. (Eds.). (2008). *Learners on the autism spectrum: Preparing highly qualified educators*. Shawnee Mission, KS: Autism Asperger Publishing Company.

Gallaudet Research Institute. (2008). *Regional and national summary report of data from the 2007-2008 Annual Survey of Deaf and Hard of Hearing Children and Youth*. Washington, DC: Author, Gallaudet University.

Gallaudet Research Institute. (2010). *Regional and national summary report of data from the 2009-2010 Annual Survey of Deaf and Hard of Hearing Children and Youth*. Washington, DC: Author, Gallaudet University.

Happe, F., Booth, R., Charlton, R., & Hughes, C. (2006). Executive function deficits in Autism Spectrum Disorders and attention deficit hyperactivity disorder: Examining profiles across domains and ages. *Brain and Cognition, 61*(1), 25-39.

Hurdy, K., Leadbitter, K., Temple, K., Klonims, V., McConachie, H., Aldred C., et al. (2010). Preschoolers with autism show greater impairments with receptive compared with expressive language abilities. *International Journal of Language Communication Disorders, 45*(6), 681-690.

Kashinath, S., Woods, J., & Goldstein, H. (2006). Enhancing generalized teaching strategy use in daily routines by parents of children with autism. *Journal for Speech, Language and Hearing Research, 49*, 466-485.

Kogan, M. D., Blumberg, S., Schieve, L., Boyle, C., Perrin, J., Ghandour, R., et al. (2009). Prevalence of parent-reported diagnosis of Autism Spectrum Disorder among children in the US, 2007. *Pediatrics 124*(4), 1-8.

Lord, C., & McGee, J. P. (2001). *Educating children with autism*. Washington, DC: National Academy Press.

Loring, W., & Hamilton (2011). *Visual supports and autism spectrum disorders*. Available from Autism Speaks website, *www.autismspeaks.org/docs/sciencedocs/atn/visual_supports.pdf*

Marks, S., Shaw-Hegwer, J., Schrader, C., Longaker, T., Peters, I, Powers, F., et al. (2003). Instructional management tips for teachers of students with Autism Spectrum Disorder. *Teaching Exceptional Children, 35*, 50-55. Available from Casenex website, *www.casenex.com/casenex/cec Readings/instructionalManagementTips.pdf*

Mesibov, G., Browder, D., & Kirkland, C. (2002). Using individualized schedules as a component of positive behavior support for students with developmental disabilities. *Journal of Positive Behavior Interventions, 25*, 58-72.

Moreno, S., & O'Neal, C. (1997). Tips for teaching high-functioning people with autism. In Indiana Resource Center for Autism, *Sourcebook for autism* (pp. 105-106). Bloomington, IN: Center for the Study of Autism, Indiana University.

Rogers, S., & Dawson, G. (2010). E*arly start Denver model for young children with autism: Promoting language, learning & engagement*. New York: The Guilford Press

Szymanski, C., & Brice, P. (2008). When autism and deafness coexist in children: What we know now. *Odyssey, 9*(1), 10-15.

Szymanski, C., Brice, P., Lam, K., & Hotto, S. (2012, January 31). Deaf children with Autism Spectrum Disorders. *Journal of Autism and Developmental Disorders*. doi: 10.1007/s10803-012-1452-9

Volmer, L. (1995). Best practices in working with students with autism. In A. Thomas & J. Grimes (Eds.), *Best practices in school psychology* (3rd ed., pp. 1031-1038). New York: Wiley & Sons.

Williams, K. (1995). Understanding the student with Asperger syndrome: Guidelines for teachers. *Focus on Autistic Behavior, 10*(2), 9-16.

Resources

Magyar, C. (2011). *Developing and evaluating educational programs for students with disabilities*. New York: Springer.

Smith, T. (2012). *Making inclusion work for students with Autism Spectrum Disorders*: *An evidence-based guide*. New York: The Guilford Press.

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Karen Martin, MS Ed, is a bilingual literacy specialist at the Delaware School for the Deaf in Newark, where she has worked for 20 years in various positions, including resident advisor, preschool teacher, elementary teacher, After School Literacy Program coordinator, and bilingual literacy specialist. She has served as vice president of the Delaware chapter of the International Reading Association. She also contracts with the Laurent Clerc National Deaf Education Center, providing consultation and coaching in literacy assessment and instruction to Kendall Demonstration Elementary School and the Model Secondary School for the Deaf. She holds a bachelor's degree in education of the deaf (K-12) from Trenton State College and a master's degree in education of the deaf (elementary) from Western Maryland College (now McDaniel College). Martin can be reached at *martink@christina.k12.de.us*.

Right: Teachers work together during a Bilingual Methods training at DSD.

IN SEARCH OF

"best practice"

a professional journey

By Karen Martin

Gandhi summed it up: "Every worthwhile accomplishment, big or little, has its stages of drudgery and triumph; a beginning, a struggle and a victory." This has been the story of my professional life as an educator of students who are deaf and hard of hearing.

The Beginning

Seeing the Challenge

I started my career in 1991, fresh out of college with my bachelor's degree in education of the deaf K-12. I took a job at the Delaware School for the Deaf (DSD) as a resident advisor in the dorm program, working with upper elementary and middle school boys. During homework hour, I remember thinking with frustration, "Why are these kids, who are really smart, struggling so much with reading?"

With that one question, my journey began. Like Leonard Nimoy, host and narrator of "In Search of," the early 1980s TV program about "the world of unsolved mysteries and those strange and unusual things in the world that defy explanation and often understanding," I was in constant search mode. I wanted to find the best practices for teaching deaf and hard of hearing children to read.

Within a few years, I moved over to the school and began teaching preschool. At the same time, I started working on my master's degree in elementary deaf education at Western Maryland College. To complete my degree, I opted to do a thesis study. The focus: literacy for deaf and hard of hearing students.

I poured over research journals and looked for studies that involved deaf students. This was the late 1990s and research on metacognition, or "thinking about thinking," especially as this applied to reading, was all the rage. This body of research looked at the positive impact of students actively engaging in reading and learning, and teachers guiding students to be aware of their own thinking and reading processes. Also, this was the time when there was emphasis on the explicit teaching of the strategies that good readers use when they negotiate print. In *Best Practice: New Standards for Teaching and Learning in America's Schools*, Zemelman,

Photos courtesy of Karen Martin

Daniels, and Hyde (1998) called for increased emphasis on teacher modeling and discussing students' reading processes as well as teaching reading as a process, including use of strategies that activate prior knowledge, help students make and test predictions, structure help during reading, and provide after-reading applications. Additionally, there was a call for increased emphasis on measuring the success of reading programs by students' reading habits, attitudes, and comprehension.

This literature led me to inquire how a supplemental after-school program that provided explicit instruction of reading strategies might impact the abilities and attitudes of deaf and hard of hearing students (Martin, 1999). I worked with four middle school students in pairs over several months, utilizing some of the reading strategies outlined by Zemelman, Daniels, and Hyde (1998). At the same time, I wanted to try something that would impact the elementary students. Thus, I worked with teachers and staff members to create the Elementary After School Literacy Program. Our goal was to provide elementary students with an opportunity to enjoy reading, while at the same time enhancing their reading abilities.

Both of these projects achieved success. The four middle school students showed more positive attitudes about reading, their sight-word vocabularies increased, and they reported more consistent use of the reading strategies (Martin, 1999). In the elementary school, the After School Literacy Program grew and improved. It became a two-day-per-week program; students alternated between meeting in small groups and meeting in one large group. During the small group time, we experimented with having the students read and then re-write what they had read into a play. Eventually, we had a very popular yearly "Performance Night" in which students put on a play or skit of a story they had read during the program.

For large group time, students selected their own readings. They completed reading logs in which they recorded the books they had read, whether or not they enjoyed the books, and whether each book was "easy," "just right," or "hard." We also engaged in hands-on literacy centers and games. This was one of those things that began with my "gut feeling." Although time engaged in the authentic act of reading was strongly supported by research, I started to suspect that our students needed more than just time reading—they needed to engage in direct experiences and develop their language abilities through social interaction. We celebrated with a yearly "Family Activity Night" in which families came and spent the evening playing games and participating in the literacy centers so familiar to their children. At this event we also displayed the students' work from the program.

Looking back now, I realize that this was what Gandhi might have called "my beginning." I was starting to zero in on the importance of direct experience, American Sign Language, and social interaction in my students' literacy development. I had found and used the research, which had led me to change and to make more effective my teaching. My ideas were forming, and I knew there was much more work to do.

The Struggle Reading, Training, Learning

During the 1999-2000 school year, I team taught a first and second grade combined class with a deaf teacher, Debbie Trapani. We were a bilingual-bicultural team and the class was quite challenging—the 14 students possessed a wide range of abilities.

I had received training in the Four Blocks Literacy Framework (Cunningham, Hall, & Sigmon, 1999), a research-based program developed by teachers in Clemmons Elementary School in Clemmons, North Carolina. Now Debbie and I attended a Four Blocks literacy training offered through our local school district and implemented the program in our classroom. This was a very concrete attempt to align our English Language Arts instruction with the local public school. This approach was identified as "best practice" in literacy instruction because it acknowledged that "children do not all learn in the same way and [provided] substantial instruction to support whatever learning personality a child has" (Cunningham, Hall, & Sigmon, 1999). The four "blocks" were:

1. Guided Reading—For students who learn to read through explicit instruction in reading
2. Working with Words—For students who learn to read using phonics and spelling
3. Self-Selected Reading—For students who learn to read using a "whole language" approach
4. Writer's Workshop—For students who learn to read through writing

We modified this framework, especially the block that focused on phonics. The following school year, Debbie and I became literacy specialists. As literacy specialists, we would be instructional coaches for our teachers, charged with keeping ourselves and our teaching staff aware of best practices, training teachers in instructional best practices, acting as liaisons between the district instructional leadership and our school, and keeping our curriculum materials up to date. During the next few years we continued to refine our use of the Four Blocks framework. I coordinated training in the Working with Words block for our speech-language pathologists so that they could use the phonics techniques with our students who had enough hearing to benefit.

The other part of our struggle was to find literacy assessments that helped inform instruction for teachers. Again,

Above: Mary Hicks and Karen Martin, DSD's current Bilingual Literacy Specialist Team

research was key. In *Reading Assessments: Principles and Practices for Elementary Teachers*, Barrentine (1999) compiled a collection of articles from *The Reading Teacher*, the professional journal published by the International Reading Association. The common theme among many of these articles was that literacy assessment needs to be developmental and sustained as well as authentic and observable. This led us to the idea of having a literacy profile—a snapshot of students' assessment results—for each student where teachers could see the results of multiple assessments over time.

We needed some school-wide assessments for consistency across grades. In one of my reading courses at Western Maryland College, I had been introduced to the Qualitative Reading Inventory-II, the second edition of an informal reading inventory that identifies student strengths and weaknesses in word recognition, comprehension, and reading strategies (Leslie & Caldwell, 1995). We decided to use the QRI-II rather than the evaluation that the public schools were using because the QRI-II includes a retelling component helpful to our teachers, who often included passage retelling in their students' Individualized Education Programs. Further, it labeled questions as "explicit" or "implicit," giving us more detailed information about our students' comprehension and abilities to answer different types of questions. We do not use the miscue analysis component of the assessment because we do not require our students to orally read the passages, nor do we encourage word-for-word signing of the passages. We wanted to observe students as they were naturally reading, give them the opportunity to read and comprehend, and then test their retelling and ability to answer the questions. We are now using the QRI-5 (5th edition, Leslie & Caldwell, 2011).

The other component we wanted to include was a writing assessment. As part of our training in the Four Blocks framework, Debbie and I were invited to a comprehensive training given by Vicki Spandell, author of *Creating Writers Through 6-Trait Writing Assessment and Instruction* (2001, 2008), who in 1984 coordinated the 17-member teacher team out of Beaverton, Oregon, that developed the original, internationally recognized 6-trait model for writing assessment and instruction. Through this training, as well as training given by the Delaware Writing Project, the idea of taking our state Department of Education's writing rubric, which was based on the 6-trait model, and re-writing it into more student-friendly

language was born. Through dialogue with our teachers, we came to the conclusion that no matter how important we felt the rubric was to improving students' writing, it would be useless unless the students really understood it and felt ownership of it as well. As a result, I worked with all of our teachers in workgroups, collaborating, discussing, and finally coming to an agreement on the language to be used in the DSD Student-Friendly Writing Rubric. In alignment with our school district, we began giving school-wide writing prompts three times a year.

In addition to identifying the school-wide assessments we would use, we had to convince teachers to actually use them. There were difficult times when we had to negotiate with some of our more veteran teachers about the value of adding these assessments and about the necessity of aligning ourselves with the district practices. However, those struggles were relatively easy to overcome. The desire of instructional staff to see our students succeed drove the process. The key was to involve them as much as possible, from as early on as possible.

The next pivotal development was our school's determination to better incorporate the use of bilingual instructional practices into our program. We participated in the ASL-English Bilingual Professional Development Program through the Center for ASL/English Bilingual Education and Research at Gallaudet University. Debbie Trapani and one of our upper elementary teachers, Mary Hicks, attended the lead mentor training and brought the training to our school. Through this training, we learned about research in best educational practices for bilingual students. My cohort read, reflected, interacted, and struggled. Eventually, we came out with a much deeper understanding of the instructional task we have before us. We are responsible for guiding our students to realize proficiency in both ASL and English as bilingual students.

The Victory Leading to Struggles Anew

Here I am in 2012, 21 years after that first experience in the dorm when I formed the question that began my journey. My bright students' struggle with reading led to my gut feeling about the importance of direct experiences, keeping instruction meaningful to students, allowing social interaction, and using students' first languages—all part of the seven principles for student success outlined in *ESL/EFL Teaching: Principles for Success* (Freeman & Freeman, 1998).

Our program just moved into a brand-new, state-of-the-art school building. Our instructional staff is strong. We share a common goal, and our leadership supports us in that goal. Debbie Trapani has moved on to be the coordinator of Family Advocacy and Child Educational Services, serving families and children with a hearing loss from birth to age 5 throughout the state. Mary Hicks has moved into the position of bilingual literacy specialist along with me. We are adding ASL assessments to the school-wide assessments included in our students' literacy profiles, and we're anxiously awaiting ASL Content Standards to be published.

I feel like we're on the precipice of victory, although victory may give way to new beginnings and lead to new struggles. With committed teachers and staff members and bright, curious students, I welcome them!

References

Barrentine, S. (Ed.). (1999). *Reading assessment: Principles and practices for elementary teachers*. Newark, DE: International Reading Association.

Cunningham, P. M., Hall, D. P., & Sigmon, C. M. (1999). *The teacher's guide to the four blocks: A multimethod, multilevel framework for grades 1-3*. Greensboro, NC: Carson-Dellosa Publishing Co., Inc.

Freeman, Y. S., & Freeman, D. E. (1998). *ESL/EFL teaching: Principles for success*. Portsmouth, NH: Heinemann.

Leslie, L., & Caldwell, J. (1995). *Qualitative reading inventory–II*. New York: Addison-Wesley Education Publishers, Inc.

Leslie, L., & Caldwell, J. S. (2011). *Qualitative reading inventory–5*. Boston: Pearson Education, Inc.

Martin, K. M. (1999). *The effect of a supplementary after-school literacy program on the recognition of sight words, literal retelling of reading passages, use of comprehension strategies, and reports of positive attitudes towards reading among four secondary students at the Delaware School for the Deaf*. Unpublished masters thesis, Western Maryland College, Westminster, MD.

Spandell, V. (2001). *Creating writers through 6-trait writing assessment and instruction* (3rd edition). New York: Addison Wesley Longman.

Spandell, V. (2008). *Creating writers through 6-trait writing assessment and instruction* (5th edition). New York: Allyn & Bacon, Inc.

Zemelman, S., Daniels, H., & Hyde, A. (1998). Best practice: *New standards for teaching and learning in America's schools*. Portsmouth, NH: Heinemann.

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RESEARCH-BASED CURRICULUM, PEDAGOGY, AND ASSESSMENT IN A

deaf bilingual program

By Laura Peterson

The California School for the Deaf (CSD), Fremont, is a deaf-centered bilingual program. Our approach to curriculum development, instructional pedagogy, and assessment integrates best practices in deaf education, bilingual education, and general education. The goals of our program are outlined in our Expected School-wide Learning Results.

Core Values

Since the authors of *Unlocking the Curriculum* (Johnson, Liddell, & Erting, 1989) proposed "…the use of ASL as a first language and as the language of instruction for deaf children," CSD has consistently and continuously celebrated its status as a bilingual school for students who are deaf. We have a holistic view of deaf children as healthy individuals who are culturally distinct, have language rights, and deserve to be educated in a language-rich environment. This approach is supported by the World Federation of the Deaf (2012), which notes on its website:

> *Deaf children learn best in sign language. A bilingual approach is becoming more popular in many countries. It means that the teaching language is sign language in all subjects for Deaf children. At the same time, it has a strong emphasis on teaching reading and writing skills of the language used in the country or society. This approach has facilitated in good learning results because it supports the natural learning and communication environment of a Deaf child.*

Photos by John T. Consoli

Bilingual Instruction and California Curriculum

As an accredited public school in the state of California, we teach to the California State Board of Education Standards and use state-adopted materials. In addition, great effort has been made to develop American Sign Language (ASL) curricula within our ASL/English bilingual program. We believe that proficiency in the first language of ASL will lead to proficiency in English. We have relied largely on the work of Jim Cummins (2006), a Canadian researcher who focuses on bilingual education, to understand how a strong foundation of conceptual knowledge in ASL can and does transfer to literacy in English.

To assist our students in developing grade-level fluency in ASL, the school has allocated instructional time to teaching ASL and invested in curriculum and materials development. Over the past few years, ASL teachers and specialists have been hired and formal courses established within each department. Immersion courses are available to elementary students. Much of our work has been guided by language planning training given both by our own staff and by the Gallaudet University Language Planning Institute's Center for ASL/English Bilingual Education and Research (CAEBER), which provides guidance and technical assistance in the implementation of ASL/English bilingual professional development in schools and programs across the nation. Our Deaf Studies

resource teacher and ASL teachers meet weekly to work on the signacy framework, an outline of the components of a solid teaching program for ASL. They also focus on producing materials that teachers can use in the classroom. We have invested heavily in visual media technology such as MacBooks that are used to allow students to receive content and produce work in both ASL and English.

Bilingual Best Practices

Every teacher receives training in bilingual best practices. Texts include Colin Baker's *Foundations of Bilingual Education and Bilingualism* and Freeman and Freeman's *ESL/EFL Teaching*. Following the model first established by CAEBER in ASL/English Bilingual Professional Development, teachers meet in groups, read research, and participate in follow-up activities and reflections during a two-year, weekly professional development program. All faculty members (in their second year of teaching and beyond) have completed or are in the process of completing this training. By requiring all CSD teachers to participate in this professional development, we have a common understanding and a shared educational language that informs and strengthens our discussions about students, instructional practices, and curriculum development.

Assessment

In addition to developing curricula and instructing students, our teachers serve on an ASL Assessment Committee to develop appropriate assessments to measure student proficiency in ASL. These assessments, in addition to our English proficiency tests, measure growth in proficiency and guide instruction. Students who need additional development in ASL are provided with support such as one-to-one pull-out services or immersion courses. All students take an ASL class as a core subject to build their language proficiency and higher-order thinking skills. Lessons are developed that address all parts of the ASL assessment rubric.

Expected School-wide Learning Results

Last spring a group of community members, parents, students, and staff members was called upon to participate in a two-day summit with the purpose of revising and expanding our Expected School-wide Learning Results. Participants were carefully chosen to represent the diversity reflected in our school community, and they included stakeholders from our Community Advisory Council; our Association of Parents, teachers, and counselors; representatives from local colleges and universities; and other advocacy and activist groups.

Members of the CSD community are very mindful of our membership in the Deaf community. Our students and staff learn about shared experiences, language, culture, and society—concepts emphasized by Paddy Ladd (2003) in *Understanding Deaf Culture: In Search of Deafhood*. As a reflection of working in a collective community, an interactive, collaborative process was used as participants developed a list of desired outcomes for our students. After the summit, these Expected School-wide Learning Results were reviewed by staff members and parents, and both stakeholder groups were given the opportunity to provide feedback. The resulting statements reflect the hopes and values of the CSD community for our graduates:

- Students will have healthy Deaf identities through shared experiences, language, culture, history, and society.

- Students will be competent bilinguals in ASL and English.
- Students will be prepared to achieve their academic, career, and personal goals.
- Students will demonstrate good character and lead healthy lifestyles.
- Students will be competent and responsible users of technology.
- Students will be lifelong learners with critical thinking skills.
- Students will contribute to their communities as advocates for human rights and social justice.

Our core values and status as a bilingual school are clearly reflected in the vision of our stakeholders. These values have guided and will continue to lead our mission of educating our deaf students.

References

Baker, C. (2006). *Foundations of bilingual education and bilingualism*. Tonawanda, NY: Multilingual Matters LTD.

Cummins, J. (2006). *The relationship between American Sign Language proficiency and English academic development: A review of the research*. Toronto: University of Toronto.

Freeman, Y. S., & Freeman, D. E. (1998). *ESL/EFL teaching*. Portsmouth, NH: Heinemann.

Johnson, R. E., Liddell, S. K., & Erting, C. J. (1989). *Unlocking the curriculum: Principles for achieving access in deaf education*. Washington, DC: Gallaudet University.

Ladd, P. (2003). Understanding deaf culture: In search of deafhood. Tonawanda, NY: Multilingual Matters LTD.

World Federation of the Deaf. Retrieved March 9, 2012, from *www.wfdeaf.org/human-rights*

Resource

Center for ASL/English Bilingual Education and Research. Retrieved March 9, 2012, from *www.gallaudet.edu/CCS/LPI_and_CAEBER.html*

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Right: Teachers in the Career Tech Ed Department participate in a discussion on how to incorporate vocabulary instruction into curriculum maps.

CURRICULUM MAPPING AND RESEARCH-BASED PRACTICE:

helping students find the path to full potential

By Jennifer Herbold

As the person who has overseen the majority of the curriculum development at the New Mexico School for the Deaf (NMSD), I am frequently asked to define our curriculum. I explain that NMSD teachers follow state standards using a wide variety of materials, strategies, activities, and assessment tools. I am often met with a blank face after my explanation and asked a second time, "But what is the NMSD curriculum?" I have come to realize that the questioners simply want to know which company's textbooks are used. This misconception—that curriculum equals a specific textbook resource—ties into a general lack of understanding of what curriculum means.

As Jacobs (2004) puts it: "The root of *curriculum* comes from the Latin *currere*, meaning 'a path or course run in small steps'." Good teachers make decisions every day about what steps to take (e.g., what to teach and how to do so). Over the past two decades, countless research-based instructional materials and educational theories have saturated the field. In addition to keeping abreast of all these developments, teachers of deaf and hard of hearing students need to take into consideration students' individualized education programs, differentiated instruction, strategies, and activities. Is it any wonder that some teachers cling to a specific marketed resource, such as a textbook series, and follow its instructions with little regard for actual evidence of student learning?

Photos courtesy of Jennifer Herbold

Wiggins (2010) writes: "We tend to define teaching by measuring all the things a teacher is supposed to *do* rather than all the things a teacher is supposed to *accomplish*." When teachers think about what they need to do, they need to think about the expected results and how they can best support students in achieving those goals. As they face decisions on the paths of learning in their classrooms, they will find curriculum maps helpful for showing the way. At NMSD, we have immersed ourselves in the process of using curriculum mapping to make sense of teaching.

Curriculum mapping is different from a "curriculum cookbook." It does not consist of daily recipes in which specific instructional ingredients are combined with a goal towards a predictable product. Good teachers create maps that take into consideration various routes in which something may be accomplished. Useful maps are flexible and provide a guide that takes into consideration possible detours and a few sightseeing trips along the way. (See Jacobs & Johnson, 2009, for templates, tools, and resources related to curriculum mapping.)

Curriculum mapping, notes Jacobs (2004), is a way to organize information and data in relation to the school calendar. Supported by independent research (e.g., Kercheval & Newbill, 2004; Division of Accountability, 2002), curriculum mapping not only supports individual teachers but also provides a way for schools to bring together all parts of the whole. In deaf education, one teacher can easily be responsible for educating students in a single class who have a broad range of academic knowledge and ability. As a result, teachers must provide additional support materials for students who benefit and yet, at the same time, they must provide challenging materials for their higher-level students.

At NMSD, we are working towards the goal of creating maps for all subject areas from K-12. This includes a wide variety of domains such as math, career exploration, physical education, and even woodworking. By no means has this been an easy process as it requires time and dedication on the part of teachers, the curriculum staff, and the administrators. I have come to understand that the main benefit reaped from the curriculum mapping process is not the finished product but the process

itself. The process provides an opportunity for teachers who teach across age and ability levels to have in-depth conversations in order to ensure the cohesion of learning in each subject area.

Anatomy of a Curriculum Map

Good curriculum maps include specific elements that vary depending on the subject. Jacobs (2004) mentions much of the following information relating to these elements in *Getting Results with Curriculum Mapping*:

- **UNIT TOPIC:** The unit topic should be a simple phrase that summarizes the entire set of lessons being taught (e.g., "important civil war battles," or "taking care of your teeth," or "quadrilaterals").
- **TIME FRAME:** This is much more challenging than it seems. The average school year in New Mexico has approximately 36 weeks. Taking into account time for standardized testing, special events, and field trips, NMSD is left with 32 weeks. On one occasion, an elementary science teacher and I decided to establish a timeline for the units of fifth grade science. We based our work on various recommendations from specific materials, the knowledge of our students, and our own instructional experiences. Much to our surprise, we ended up with units planned for 49 weeks! We had to go back, analyze our time frame, and make decisions on how to reduce specific units.
- **ESSENTIAL QUESTIONS:** Teachers are often concerned with the nuts and bolts of teaching, and taking a broader perspective can be difficult at times. When developing essential questions, we need to take a step back and consider why we are teaching any given material. Why do students need to learn this? What will be relevant to them and help them remember what they've learned? Essential questions should be the cornerstone of each unit and enable students to make meaning and connections.
- **STANDARDS:** State-developed standards, along with the nationwide common core standards, have become an extremely important consideration when deciding what to teach. Mapping provides a way to ensure that all standards are covered. During our mapping sessions, teachers and the curriculum staff match standards to various units and select specific textbook chapters to teach as well as identify related resources. We have consistently found that although some resources claim to meet all the New Mexico state standards for a specific grade level and content area, often standards are missed or insufficiently covered. This necessitates the addition of supporting resources and materials.
- **CONTENT AND SKILLS:** These sections list exactly what is being taught and what skills students are expected to acquire.
- **RESOURCES, ACTIVITIES, AND ASSESSMENTS:** Resources, activities, and assessments are continually updated as new resources (including but not limited to visual aids such as posters, websites, and textbooks) are procured. We have found that it is possible to plan the same standards, essential questions, content, and skills for each class's higher- and lower-level groups. For example, sometimes we have two textbooks or materials geared to different reading groups within the same subject and grade level. Within the resources section, we label those accordingly (e.g., "Group A: Chapter 14; Group B: Chapter 12").
- **REFLECTIONS:** This is a section that we have left blank for teachers to document their thoughts during or after each unit topic. They can review assessment information to determine if the mapped out unit does what it is intended to do. They can make notes of different activities and new ideas that can be added to the map.

Curriculum Mapping for Deaf Students—A Personal Experience

Within the field of deaf education, the mapping process must take into consideration the language and communication needs of the students. At NMSD, we have tried to address those

needs through the compilation of various print and non-print resources and included differentiated activities from which teachers may choose. One of the challenges we have encountered is considering the needs of the deaf students who are able to understand age-appropriate information in ASL yet who cannot understand the same information through printed English. The quality of the information conveyed should not be diminished for lack of textbook resources at their reading levels. For example, one of our high school history teachers has developed a wide body of PowerPoint slides on different time periods in the history of the United States and those slides were incorporated into the American History curriculum maps. Other activities and resources might include field trips, student-friendly websites, and projects. As an ASL-English bilingual school, NMSD includes the development of ASL and literacy in its lesson plans regardless of content area.

I have learned—often the hard way—that it is not enough to have teachers attend training sessions and then create curriculum maps within their own groups. The success of this process is contingent upon having a strong leader within each curricular domain who can provide ongoing support to teachers. Through trial and error, I have found that each domain has its own needs, and some mapping templates fit some content areas better than they do others.

In order to introduce this process, teachers from a specific content area meet for a full day with the curriculum staff (substitute teachers for their classes are provided). We get as much done as possible during this day in terms of separating standards into units, developing essential questions along with an approximate timeline, and we add as many resources as possible. Invariably, we accomplish less throughout the day than we had hoped to, but the event allows teachers and the curriculum staff to have a better understanding of what needs to be done. The curriculum staff meets with teachers from all content areas throughout the year on a rotating basis.

Curriculum maps are living documents. Although we are a couple of years into this process, we are still only at the beginning stages. We know that our teachers will need to consult and perhaps revise the maps as often as possible. Throughout the next two years, our main focus will be creating preliminary maps for each content area at the K-12 grade levels. Opportunities for NMSD's teachers to review their documentation, add activities, and develop the resources sections will be provided. There is a plethora of information on curriculum mapping available online, including workshops and planners. Each school needs to figure out what works best for its program and develop templates in addition to forming short-term and long-range mapping plans.

Marzano (2010) presents evidence of the positive relationship between teacher competence and student achievement. As we are well into the 21st century of research-based instruction, mapping increases teacher competency by enabling teachers to think reflectively, review documentation and assessment data regularly, develop strategies, and consider state standards. All this leads to our ultimate goal of students being provided with the information and skills they need to reach their full potential.

References

Division of Accountability. (2002). *A study of effective practices in Virginia schools*. Paper prepared by the Governor's Best Practice Centers for the Virginia Department of Education. Retrieved November 15, 2011, from *www.clihome.com/Docs/CM /VirginiaFullReport.pdf*

Jacobs, H. H. (Ed.). (2004). *Getting results with curriculum mapping*. Alexandria, VA: Association for Supervision and Curriculum Development.

Jacobs, H. H. (2010). Cartography: How curriculum mapping has changed the role and perspective of the teacher. In R. Marzano (Ed.), *On excellence in teaching*. Bloomington, IN: Solution Tree Press.

Jacobs, H. H., & Johnson, A. (2009). *Curriculum mapping planner: Templates, tools, and resources for effective professional development*. Alexandria, VA: ASCD.

Kercheval, A., & Newbill, S. L. (2004). *A case study of key effective practices in Ohio's improved school districts*. University of Indiana at Bloomington, Indiana Center for Evaluation. Retrieved November 15, 2011, from *www.indiana.edu/~ceep/projects/PDF/200202_Key_Effec_Prac_Final_Report.pdf*

Marzano, R. (2010). Developing expert teachers: Defining the role of the classroom teacher. In R. Marzano (Ed.), *On excellence in teaching*. Bloomingon, IN: Solution Tree Press.

Wiggins, G. (2010). What's my job? Defining the role of the classroom teacher. In R. Marzano (Ed.), *On excellence in teaching*. Bloomington, IN: Solution Tree Press.

Resources

Curriculum 21: Mapping the global classroom of the future, *www.curriculum21.com*

Jacobs, H. H. (1997). *Mapping the big picture: Integrating curriculum & assessment K-12*. Alexandria, VA: Association for Supervision and Curriculum Development.

clues from research:

effective instructional strategies leading to positive outcomes for students who are deaf or hard of hearing

By Susan R. Easterbrooks and Brenda H. Stephenson

Susan R. Easterbrooks, EdD, is a professor of deaf education in the Department of Educational Psychology and Special Education at Georgia State University (GSU). In the field of deaf education for almost 40 years, she has published over 50 articles, chapters, and books. She and her colleagues at GSU are developing an evidence-based literacy curriculum for deaf and hard of hearing preschoolers through the support of several grants from the Institute of Education Science.

In 1999, the National Reading Panel investigated arguments regarding how best to teach reading. The members of the panel examined thousands of articles on literacy development and identified six key factors in teaching reading. According to the National Reading Panel (2000), these factors were:

- Phonemic awareness
- Alphabetics (i.e., letter knowledge, phonological awareness, phonics)
- Vocabulary
- Text comprehension
- Fluency
- Motivation

Further, the passage of No Child Left Behind in 2001 obligated teachers to use scientifically proven practices, or evidence-based practices, supported by research that is both valid and compelling (Graham, 2005). Although the goal for educators has always been student learning, No Child Left Behind has renewed emphasis on student outcomes. In many states, students' test scores are tied to teacher pay as well as the granting of tenure (Winerip, 2011). This shift of focus requires teachers to implement strategies that will have the greatest impact on student learning.

In 1999, the Association of College Educators-Deaf & Hard of Hearing initiated a review of the literature surrounding practices in the areas of literacy, mathematics, and science. The associations' researchers identified 20 strategies regarded by the profession to be best practices in literacy, in mathematics, and in science instruction for deaf and hard of hearing students prior to and surrounding the beginning of the current millennium (Easterbrooks & Stephenson, 2006). Then the researchers sought to determine the evidence base for these practices, summarizing them as *weak*, *developing*, *conflicting*, *or strong*. (See Easterbrooks &

Photos courtesy of Brenda H. Stephenson

TABLE 1.

Strategies for Teaching Deaf and Hard of Hearing Students

Prior to 2000, Ratings of Their Evidence Base, and Master Teachers' Impressions of Benefit and Likelihood of Use

STRATEGY	RATING OF THE BODY OF EVIDENCE*	MASTERS TEACHERS' RATINGS OF BENEFIT**	MASTER TEACHERS' LIKELIHOOD OF USE
TEN LITERACY STRATEGIES			
1. Independent reading	Developing	86%	83%
2. Technology	Minimal	76%	70%
3. Phonological awareness and phonics	Conflicting	46%	40%
4. Metacognitive strategies	Strong	89%	89%
5.Writing to promote reading	Strong	89%	78%
6. Scaffolding content-area reading materials	Weak	83%	8%
7. Shared reading and writing	Strong	62%	52%
8. Meaning-based vocabulary instruction	Strong	89%	89%
9. Morphographemic-based vocabulary instruction	Developing	65%	64%
10. Fluency	Developing	76%	64%
TEN MATHEMATICS AND SCIENCE STRATEGIES			
1.Teachers who are skilled communicators	Strong	92%	92%
2. Use of student's first language	Developing	78%	80%
3. Content knowledge and skills (highly qualified)	Developing required by law	54%	60%
4. Cognitively engaged students	Strong	84%	80%
5. Visual organizers	Strong	92%	97%
6. Authentic problem solving	Developing	78%	71%
7. Technology	Weak	86%	74%
8. Signs for specialized content vocabulary	Weak	86%	80%
9. Critical thinking and problem-solving skills	Developing	54%	74%
10. Mediating text	Weak	92%	80%

**From Easterbrooks & Stephenson (2006) ** From Easterbrooks, Stephenson, & Mertens (2006)*

Stephenson, 2006, for a full discussion of the rating system). For example, the body of research to support the strategy of "independent reading" was found to be developing, while the research supporting "technology" was found to be minimal, and research supporting "meaning-based vocabulary instruction" was found to be strong. (See Table 1 above.)

In a follow-up study (Easterbrooks, Stephenson, & Mertens, 2006), master teachers were asked to indicate whether or not they found the 20 identified strategies beneficial (see definitions in Easterbrooks, Stephenson, & Mertens, 2006) and if they were likely to use those strategies.

The results showed that teachers of deaf and hard of hearing students appeared to be conflicted over the instruction of phonological awareness and phonics, were unlikely to scaffold reading skills using content area reading materials, were not convinced of the value of shared reading and writing, and were ambivalent about the need to be highly qualified in a content area. As a group, they did not employ collaborative, case-based, real-world, authentic problem-solving, and they were ambivalent about teaching higher-order critical thinking and problem-solving skills.

Further, only seven of the 20 strategies

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Left: A science teacher implements inquiry-based instruction with her first graders as they explore plant life.

examined had a strong practice or evidence base. Perhaps because so little was known beyond personal experience and belief, master teachers were not uniformly in support of strategies with a strong history of practice. At the time we studied these practices, we could find no causal research and only minor experimental or quasi-experimental evidence as proof of the effectiveness of the strategies. Since that time, however, some practices have developed a stronger evidence base, while others still remain without the backing of research needed to support their implementation as evidence-based practice.

Other Efforts to Examine Evidence

At least two other attempts to examine the evidence base for teaching strategies used in deaf education have occurred. Luckner and Handley (2008) examined the literature from 1963 to 2002 in the area of reading comprehension and found 52 articles that provided a "tentative evidence-based practice" (Thompson, Diamond, McWilliam, Snyder, & Snyder, 2005, p. 17) for five instructional practices:

1. Using explicit comprehension strategy instruction (e.g., predicting or summarizing)
2. Teaching students story grammar (e.g., characters, setting, plot, conclusion)
3. Modifying Directed Reading Thinking Activity (Schirmer, 2000; Stauffer, 1969)
4. Activating background knowledge (e.g., through visual aids or mental imagery)
5. Using well-written, high-interest text (i.e., high quality literature [p. 28])

Luckner and Cooke (2010) examined the literature from 1967 through 2008 in the area of vocabulary knowledge and acquisition and found 10 articles of 41 that included an intervention. They found evidence for the following strategies to promote vocabulary acquisition:

- Maintaining quality/quantity conversation and interactions with others, which provide opportunities for multiple exposures to a word
- Using computer-controlled applications for vocabulary enhancement
- Providing semantic organization of vocabulary instruction
- Using graphic organizers
- Pursuing explicit and extensive vocabulary instruction
- Reading and being read to
- Instructing in inferential strategies

Finally, following the Luckner and Cooke (2010) format, Luckner and Urbach (2011) examined the literature from 1970 through 2009 in the area of fluency and found only six studies on the topic of fluency are literacy in deaf and hard of hearing readers, only four of which included interventions. Most of their recommendations took the form of suggested questions for research and they concluded:

> *Fluency is a critical aspect of teaching reading that has not been explored fully in the field of education of students who are deaf and hard of hearing. An unfortunate result is that professionals may not be assessing or teaching the skill, which may contribute to students experiencing difficulty becoming skilled readers*. (p. 10)

The findings of these research summaries mirror many of the strategies that were developing an evidence base in 2000, but we still do not find strong causal evidence (i.e., a scientific study including a control and an intervention group that demonstrated a particular strategy yields positive learning outcomes for students).

Update on Research

Although the National Reading Panel clearly identified motivation as a key factor in learning to read, this topic receives less attention in the reading literature than the other reading factors identified. In fact, when the National Reading Panel's list of important factors in teaching literacy are discussed, it is often under the moniker "The Fab Five" and by this is meant phonemic awareness, phonics, vocabulary, text comprehension, and fluency (Fang, 2008); the topic of motivation is nowhere to be found.

Yet we have evidence that lack of motivation is a barrier to reading comprehension, but we have no evidence on how to improve motivation. Further, motivation, or lack thereof, is an issue that influences learning in general, not just in the area of literacy, with self-efficacy, interest, mastery goal orientation, and engagement being greater in female second language learners and avoidance-coping and effort withdrawal being greater in male second language learners. In addition, younger students appear more motivated than

older students. (Yeung, Lau, & Nie, 2011)

In recent years, there has been an explosion of research, yet additions to the evidence base have been inconsistent across the 20 practices. Nevertheless, evidence has been discovered to support strategies for successful teaching in literacy and math. Below we describe the evidence that has been added to the knowledge base.

Literacy: Strategies for Success

USE TECHNOLOGY AND MOTIVATING INSTRUCTIONAL MATERIALS

Various technologies and instructional materials have recently been found to increase motivation and attention in deaf and hard of hearing learners in the context of language learning and literacy tasks. For example, computer models provide effective representations of speech (Massaro & Light, 2004), and in Thailand, computers effectively translate between sign language and text (Dangsaart, Naruedomkul, Cercone, & Sirinaovakul, 2008). Mediated use of ASL stories on video has improved math vocabulary (Cannon, Fredrick, & Easterbrooks, 2010), and mediated use of a multi-media package for teaching morphosyntax (i.e., grammar) has demonstrated positive outcomes (Cannon, Easterbrooks, Gagne, & Beal-Alvarez, 2011). The use of multi-media technology may increase attention through the incorporation of imagery, which is associated with good reading instruction, and may support retention and memory during academic tasks (Easterbrooks, 2010).

INTRODUCE AND TEACH THE ALPHABETIC CODE

There is conflicting evidence about the importance of phonological awareness for deaf and hard of hearing children (Mayberry, del Giudice, & Lieberman, 2011). Children with at least some degree of functional hearing have been able to master the phonological code (Easterbrooks, Lederberg, Miller, Bergeron, & Connor, 2008; Hyde, Punch, & Grimbeek 2011) and develop phonological awareness (Guardino, Syverud, Joyner, & King, 2011; Johnson & Goswami, 2010; Syverud, Guardino, & Selznick, 2009) that can be enhanced by the use of visual supports, such as Visual Phonics or Cued Speech (Narr, 2008; Smith & Wang, 2010; Trezek, Wang, Woods, Gampp, & Paul, 2007). Although we know less about what is needed to teach the alphabetic code to deaf and hard of hearing children with no functional hearing, there is recent evidence that supports its potential (Beal-Alvarez, Lederberg, & Easterbrooks, 2011).

BREAK WORDS INTO MEANINGFUL PARTS

One way that children in early grades can learn to decode words is through mastery of what linguists call

derivational and inflectional morphology (i.e., the mastery of base words, prefixes, and suffixes). Several researchers have found evidence that it is easier for deaf and hard of hearing students to decode words by segmenting them into their component morphological parts than it is to decode words through the alphabetic principle (Gaustad & Kelly, 2004; Nunes, Burman, Evans, & Barros, 2010; Nunes, Burman, Evans, & Bell, 2010). Mastery of grapheme-morpheme correspondence to morphological representation, whether through spoken or fingerspelled morphology (i.e., children would learn to say or fingerspell and attach meaning to those sounds or fingerspelled configurations). Deaf and hard of hearing children who use both spoken language and sign language demonstrated that they can learn English morphosyntax from carefully structured instruction that includes frequent targeted practice (Cannon, Easterbrooks, Gagne, & Beal-Alvarez, 2011; Merchant, de Villiers, & Smith, 2008; Nunes, Burman, Evans, & Barros, 2010).

Science and Math: Effective Strategies

SKILLED COMMUNICATION

Effective communication is critical in any classroom, but the importance of the teacher's communication competency with deaf and hard of hearing students has even greater implications in mathematics and science instruction. Much of the research about communication and instruction with deaf students is directed at the use of ASL (Ansell & Pagliaro, 2006; Lang et al., 2007; Lang & Pagliaro, 2007; Pagliaro & Kritzer, 2010). One study conducted with young deaf and hard of hearing children determined that the frequency and quality of mediated learning, i.e., learning that is scaffolded by a more knowledgeable individual, such as an older peer, a parent, or an effective teacher had a significant impact on the child's learning in mathematics (Pagliaro & Kritzer, 2010). Another found that teachers who were able to use more conceptually accurate signs provided greater understanding in science (Lang et al., 2007). Competence in sign and careful sign selection are critical because they support higher order thinking in science and mathematics.

CONTENT CERTIFICATION

There is no question that high levels of content knowledge, mandated by No Child Left Behind, are needed for instruction with deaf and hard of hearing students (Benedict, Johnson, & Antia, 2011); Lang & Pagliaro, 2007; McIntosh, Suben, Reeder, & Kidd, 1994; Wang, 2011). In some states, deaf education licensure spans pre-

kindergarten through grade 12, yet teachers may not have the content knowledge to support all those levels. In other words, dual certification in both a content area and deaf education is needed to afford quality instruction and increase student performance. "Teachers with mathematics degrees/certification appear to be better prepared to teach content," affirmed Lang and Pagliaro (2007, p. 458). The same holds true for teachers in inclusion settings when teaching knowledge of concepts and vocabulary in content areas (Benedict, Johnson, & Antia, 2011).

MEDIATE—OR EXPLAIN—THE TEXT

Deaf and hard of hearing students have difficulty with printed text, and instruction in science and mathematics remains text-based. As a result, many deaf and hard of hearing students lack the level of science knowledge needed to comprehend abstract concepts. Paul and Wang (2006) stated that combining oral or sign literacy with scientific inquiry might help deaf and hard of hearing students develop better scientific conceptual knowledge. Wang (2011) suggests a recording of class discussion paired with the use of inquiry-based instruction to provide practice at home, which would allow students to revisit information presented in class and process the content for increased understanding. Other effective mediation strategies include visual scaffolds and technology (Adamo-Villani & Wright, 2007; Leander, 2009; Wang, 2011).

Looking Back...Looking Ahead

The evidence base for six strategies for literacy, science, and mathematics instruction of deaf and hard of hearing students has increased in significant ways. Still, the level of evidence is limited. Perhaps the new wave of technology-savvy individuals with doctorates in deaf education, educated through the National Leadership Consortium on Sensory Disabilities, will provide further rigor to the evidence base by engaging in multi-site, multi-state collaborative research.

References

Adamo-Villani, N., & Wright, K. (2007). SMILE: An immersive learning game for deaf and and hearing children. *ACM Proceedings of Siggraph 2007-Educators*, San Diego (accepted).

Ansell, E., & Pagliaro, C. M. (2006). The relative difficulty of signed arithmetic story problems for primary level deaf and hard-of-hearing students. *Journal of Deaf Studies and Deaf Education, 11*(2), 153-170.

Beal-Alvarez, J., Lederberg, A., & Easterbrooks, S. R. (2011). Grapheme-phoneme acquisition of deaf preschoolers. *Journal of Deaf Studies and Deaf Education*. On-line doi: 10.1093/deafed/enr030

Benedict, K. M., Johnson, H., & Antia, S. D. (2011). Faculty needs, doctoral preparation, and the future of teacher preparation programs in the education of deaf and hard of hearing students. *American Annals of the Deaf, 156*(1), 35-46.

Cannon, J. E., Easterbrooks, S. R., Gagne, P., & Beal-Alvarez, J. (2011). Improving DHH students' grammar through an individualized software program. *Journal of Deaf Studies and Deaf Education, 16*(4), 437-457. doi: 10.1093/deafed/enr023

Cannon, J. E., Fredrick, L. D., & Easterbrooks, S. R. (2010). Vocabulary instruction through books read in ASL in English language learners with hearing loss. *Communication Disorders Quarterly, 31*, 98-112. doi:10.1177/1525740109332832

Dangsaart, S., Naruedomkul, K., Cercone, N., & Sirinaovakul, B. (2008). Intelligent Thai text- Thai sign translation for language learning. *Computers & Education, 51*, 1125-1141. doi:10.1016/j.compedu.2007.11.008

Easterbrooks, S. R. (2010). Evidence-based curricula and practices that support development of reading skills. In M. Marschark, & P. E. Spencer (Eds.), *The Oxford handbook of deaf studies, language, and education, Vol. 2* (pp. 111-126). New York: The Oxford University Press.

Easterbrooks, S., Lederberg, A., Miller, E., Bergeron, J., & Connor, C. (2008). Emergent literacy skills during early childhood in children with hearing loss: Strengths and weaknesses. *The Volta Review, 108*, 91-114.

Easterbrooks, S., & Stephenson, B. (2006). An examination of twenty literacy, science, and mathematics practices used to educate students who are deaf or hard of hearing. *American Annals of the Deaf, 151*(4), 385-397.

Easterbrooks, S., Stephenson, B., & Mertens, D. (2006). Master teacher responses to twenty literacy and science/math practices in deaf education. *American Annals of the Deaf, 151*(4), 398-409.

Fang, Z. (2008). Going beyond the Fab Five: Helping students cope with the unique linguistic challenges of expository reading in intermediate grades. *Journal of Adolescent and Adult Literacy, 51*(6), 476-487.

Gaustad, M. G., & Kelly, R. R. (2004). The relationship between reading achievement and morphological word analysis in deaf and hearing students matched for reading level. *Journal of Deaf Studies and Deaf Education, 9*, 269-285.

Graham, S. (2005). Further behind the scenes of intervention research. *Learning Disabilities Research & Practice, 20*, 221-224.

Hyde, M., Punch, R., & Grimbeek, P. (2011). Factors predicting functional outcomes of cochlear implants in children. *Cochlear Implants International, 12*(2), 94-104. doi:10.1179/146701010x12677899497317

Lang, H. G., Hupper, M. L., Monte, D. A., Scheifele, P. M., Brown, S. W., & Babb, I. (2007). A study of technical signs in science: Implications for lexical database development. *Journal of Deaf Studies and Deaf Education, 12*, 65-79.

Lang, H., & Pagliaro, C. (2007). Factors predicting recall of mathematics terms by deaf students: Implications for teaching. *Journal of Deaf Studies and Deaf Education, 12*(4), 449-460.

Leander, K. (2009). Composing with old and new media: Toward a parallel pedagogy. In V. Carrington & M. Robinson (Eds.), *Digital literacies: Social learning and classroom practices* (pp. 147-163). London, England: Sage.

Luckner, J., & Cooke, C. (2010). A summary of the vocabulary research with students who are deaf or hard of hearing. *American Annals of the Deaf, 155*(1), 38-67.

Luckner, J., & Handley, C. M. (2008). A summary of the reading comprehension research undertaken with students who are deaf or hard of hearing. *American Annals of the Deaf, 153*(1), 6-36.

Luckner, J. L., & Urbach, J. (2011). Reading fluency and students who are deaf or hard of hearing: Synthesis of the research. *Communication Disorders Quarterly*. Published online before print November 21, 2011. doi: 10.1177/1525740111412582

Massaro, D. W., & Light, J. (2004). Improving the vocabulary of children with hearing loss. *The Volta Review, 104*, 141-174.

Mayberry, R. I., del Giudice, A. A., & Lieberman, A. M. (2011). Reading achievement in relation to phonological 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

McIntosh, R. A., Suben, L., Reeder, K., & Kidd, D. H. (1994). Making science accessible to deaf students: The need for science literacy and conceptual teaching. *American Annals of the Deaf, 139*(5), 480-484.

Merchant, G., de Villiers, J., & Smith, S. (2008). *Optimized intervention software benefits grammer skills in young oral deaf children*. Paper presented at the Council for Execeptional Children, Boston, Massachusetts.

Narr, R. F. (2008). Phonological awareness and decoding in deaf/hard-of-hearing students who use visual phonics. *Journal of Deaf Studies and Deaf Education, 13*(3), 405-416. doi: 10.1093/deafed/enm064

National Reading Panel. (2000). *Report of the National Reading Panel: Teaching children to read—An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction*. Jessup, MD: National Institute for Literacy.

Nunes, T., Burman, D., Evans, D., & Barros, R. (2010). *Improving deaf children's literacy: The importance of syntax and morphology*. Paper presented at the American Educational Research Association, Denver, Colorado.

Nunes, T., Burman, D., Evans, D., & Bell, D. (2010). Writing a language that you can't hear. In N. Brunswick, S. McDougall, & P. de Mornay Davies (Eds.), *Reading and dyslexia in different orthographies* (pp. 109-128). New York: Psychology Press.

Pagliaro, C. M., & Kritzer, K. L. (2010). Learning to learn: An analysis of early learning behaviors demonstrated by young deaf/hard-of-hearing children with high/low mathematics ability. *Deafness and Education International, 12*(2), 54-76.

Paul, P., & Wang, Y. (2006). Literate thought and multiple literacies. *Theory into Practice, 45*(4), 304-310.

Schirmer, B. R. (2000). *Language and literacy development in children who are deaf* (2nd ed.). Boston: Allyn & Bacon.

Smith, A., & Wang, Y. (2010). The impact of visual phonics on the phonological awareness and speech production of a student who is deaf: A case study. *American Annals of the Deaf, 155*(2), 124-130.

Stauffer, R. G. (1969). *Directing reading maturity as a cognitive process*. New York: Harper & Row.

Syverud, S. M., Guardino, C., & Selznick, D. N. (2009). Teaching phonological skills to a deaf first grader: A promising strategy. *American Annals of the Deaf, 154*(4), 382-388.

Thompson, B., Diamond, K. E., McWilliam, R., Snyder, P., & Snyder, S. W. (2005). Evaluating the quality of evidence from correlational research for evidence-based practice. *Exceptional Children, 7*(2), 181-194.

Trezek, B. J., Wang, Y., Woods, D. G., Gampp, T. L., & Paul, P. V. (2007). Using visual phonics to supplement beginning reading instruction for students who are deaf or hard of hearing. *Journal of Deaf Studies and Deaf Education, 12*(3), 373-384. doi:10.1093/deafed/enm014

Wang, Y. (2011). Inquiry-based science in instruction and performance literacy for students who are deaf and hard of hearing. *American Annals of the Deaf, 156*(3), 239-254.

Winerip, M. (2011, November 6). In Tennessee, following the rules for evaluations off a cliff. *New York Times*. Retrieved November 13, 2011, from *www.nytimes.com*

Yeung, A. S., Lau, S., & Nie, Y. (2011). Primary and secondary students' motivation in learning English: Grade and gender differences. *Contemporary Educational Psychology, 36*(3), 246-256.

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evidence and evolution: research and teachers' intuition lead to a bilingual program

By Cathy Rhoten

Truly successful decision-making relies on a balance between deliberate and instinctive thinking.
~ Malcolm Gladwell

A visit to any classroom at the Western Pennsylvania School for the Deaf (WPSD) or The Scranton School for Deaf and Hard of Hearing Children reveals a host of amazing things—all at the same time. Visitors see dedicated and passionate teachers presenting engaging and relevant material. They see an all-inclusive communication environment, where American Sign Language (ASL) may be as prevalent as spoken English or sign-supported English. They see Smartboards, textbooks, document cameras, laptop computers, papers, pencils, and just about any other tool being used by content, comfortable, and smiling children eager to soak up the lessons of the day.

It is no accident that these classrooms include all of these things. They are in place to fulfill the goal of preparing each deaf and hard of hearing student for all aspects of life through a continuum of high-quality, individualized education and extracurricular programs. We develop our programs through a unique blend of common sense, experience, instinct, and an unwavering dedication to superior research.

Photos courtesy of the Western Pennsylvania School for the Deaf/The Scranton School

Right: Through classroom observations in the ASL/English project, it is clear that the children are enthusiastic and highly motivated when learning about their language.

Research is the systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions. The challenge facing many institutions devoted to educating deaf and hard of hearing children is just exactly how to remain committed to research-based decision while continuing with the everyday duties of teaching and remaining in compliance with the seemingly endless amount of state and national mandates.

Yet as challenging as it may be, our experiences have clearly affirmed that research is an extremely vital tool and needs to be incorporated into the daily activities, approaches, and decision making used in any school for deaf and hard of hearing children.

Who We Are and How We Strive to Serve

WPSD is the largest comprehensive center for the education of deaf and hard of hearing students in Pennsylvania. We offer an all-inclusive language environment and a curriculum that incorporates state and national standards. The Scranton School has been part of WPSD since 2009. All programs are fundamentally committed to the practice of decision making through research. We believe that it is vital to utilize well-collected and appropriately analyzed research to make the best decisions regarding the education of deaf and hard of hearing children. Our school leadership understands that there are many factors to consider before deciding that a specific research approach matches a given situation, but the successes of our students over the years have vividly shown the value of data-driven, research-based decision making in our schools.

Behind every decision that is made within our schools is a very simple approach: *Is that decision in the best interests of the individual child, and will that student actually learn something?* That is what matters the most. Theory alone will not result in effective learning. Practice alone—even with superior teachers fully engaged in the process—will not result in success for the student. We have come to believe that the most effective learning stems from the practical application of theory in a classroom environment.

Above: WPSD has prioritized continued examination of students' emerging skills through the ASL/English project and looks forward to garnering even greater insight into successful teaching and learning methodologies for deaf and hard of hearing children.

Teaching ASL and English to Young Children

The ASL/English project is a comprehensive example of the benefits and challenges of committing to research-driven decision making at WPSD and The Scranton School. A little over 10 years ago, two dedicated teachers at the WPSD Children's Center began to consider the possibilities of direct teaching of ASL and the English language to one class of 4-year-old deaf children. Maintaining separate ASL and English teachers in the classroom had support in research (Andrews & Akamatsu, 1993). It was believed that deaf children who understood the relationships of ASL and English would experience greater ease in developing English skills (Schimmel, Edwards, & Prickett, 1999).

The model developed at WPSD is similar to that of a bilingual home where one parent speaks one language while another speaks a different language. In much of the research regarding bilingual development, this approach is shown to be highly advantageous to the learning of two languages. The two languages do not only coexist within the household, but each is consistently and separately used by different family members. The focus of the ASL/English project is to provide this sequential exposure to ASL and English.

In the first year, the teachers worked together to present the two languages using varying content as a vehicle for language comparisons. For example, initially teachers used children's literature as the vehicle for demonstrating differences in the two languages. By the end of that first year, the teachers determined that the content for language expression needed to be information well known to the child. Books and stories contained too much information. Teachers found that students could not grasp the meaning of the story and also think about differentiating between the languages.

In the second year, teachers used classroom experiences or known information as the vehicle for teaching the language differences (Hammond, 1998). Again, success, as defined by students' differentiated use of the

Decision making driven by research is paramount to creating and sustaining a culture of educational excellence in our schools.

two languages, seemed best when students were most familiar with the content.

Formal ASL/English lessons were scheduled twice each week for approximately 30 to 45 minutes each. The supportive vocabulary—such as that gleaned from the experience of making a snowman—would be taught prior to the ASL/English lesson and within the context of the experience. Also, the speech therapist would use the vocabulary in lessons or embed it in the weekly spelling list.

Approximately three years into the project, a very specific format for ASL/English lessons was developed. Teachers conducted ASL/English lessons by assigning specific roles to each of the two teachers in the room and maintaining those roles throughout the year.

In the early stages of the project, Dr. Marc Marschark, professor at the National Technical Institute for the Deaf and the School of Psychology at the University of Aberdeen, Scotland, began meeting and consulting with teachers involved in the ASL/English project. We discussed many issues, from selection of teaching content (e.g., which linguistic structures are appropriate to teach to 4- and 5-year-old deaf children) to methods for effectively evaluating success (Marschark, Lang, & Albertini, 2002). Marschark spent many hours observing in classrooms, meeting with teachers, and consulting on methodologies.

It was during this time that students made good progress in distinguishing the characteristics and grammar of each language. Some were able to generate messages either in ASL or spoken English in a linguistically controlled format about known events in accordance with a teacher's directions. This was apparent in the classroom with many of the children, but what remained untested was how well the students could use those skills outside of the classroom within a new context. The next phase of the project was directed towards asking children to do exactly that.

Students were asked to view a cartoon and then videotaped as they described the events that transpired in the cartoon using ASL or English. The videotapes—empirical evidence—revealed that nearly all of the children made a noticeable shift in language on demand, and the children showed emerging understanding of the language differences.

A milestone in the ASL/English project came when efforts were directed towards more formally defining the curriculum. Marschark provided some strong reference material and articles that provided new summaries of ASL linguistics. More information about bilingual education and strategies and outcomes of using various strategies with hearing children learning two spoken languages were read and discussed.

Through classroom observations in the ASL/English project, it is clear that children are enthusiastic and highly motivated about learning. It has also been exciting to see teachers engaging in conversations about the acquisition of language skills and the interrelationships of ASL and English.

Often Challenging, Always Worthwhile

This wide-ranging project illustrates how educators of deaf and hard of hearing children can and should be motivated to explore the latest research and to confer realistic applications of theory in the classroom. The use of research to make decisions about the programs and policies affecting the individual student attending WPSD and The Scranton School has become the centerpiece of our commitment to constantly improving our methods of educating deaf and hard of hearing children. Participation and feedback from school leaders, teachers, parents, and students is the norm as we strive to identify areas where we need to do better.

Decision making driven by research is paramount to creating and sustaining a culture of educational excellence in our schools. Instincts, anecdotes, and experience also play a pivotal role in decision making, but empirical data garnered through research is essential when important educational decisions are being made. The challenges of research-driven decision making may often be great, but when the best interests of the child need to be met, we at WPSD and The Scranton School know that it is always worthwhile.

References

Andrews, J., & Akamatsu, T. (1993). Building blocks for literacy: Getting the signs right. *Perspectives in Education and Deafness, 11*(3), 5-9.

Hammond, W. D. (1998, October). *Effective & power techniques for bringing up the bottom quarter of readers*. Mississippi Association for Supervision and Curriculum Development, Fall Workshop.

Marschark, M., Lang, H., & Albertini, J. (2002). *Educating deaf students from research to practice*. New York: Oxford University Press.

Schimmel, C., Edwards, S., & Prickett, T. (1999). Reading? ..Pah! (I got it!). *American Annals of the Deaf, 144*(4), 298-307.

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Howard, G. (1991). Culture tales: A narrative approach to therapy in a cross-cultural psychology and psychotherapy. *American Psychologist, 40*, 187-197.

Mason, D., & Ewoldt, C. (1996). Whole language and deaf bilingual-bicultural education—naturally! *American Annals of the Deaf, 141*(4), 293-298.

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RESPONDING TO NCLB IN ALASKA

a three-pronged, teacher-focused approach yields success

By Jennifer Sees

At the beginning of the 2011-2012 school year, we received news that the Alaska State School for the Deaf and Hard of Hearing (ASSDHH) had met Alaska's Annual Yearly Progress as required by No Child Left Behind (NCLB) for the first time ever. This was incredibly exciting and worth celebrating since teachers had invested so much "blood, sweat, and tears" over the course of our first year. This is how we did it.

There is a rugged tenacity, a spirited individualism, an unconquerable work ethic, and an extreme passion for life that we feel is unique to Alaskans—and the teachers at ASSDHH are no exception. Our teachers accept and surmount unique challenges to bring our deaf and hard of hearing Pre-K to grade 12 students the best practices in research-based education. The ASSDHH is under the leadership of the Anchorage School District and is composed of seven ASSDHH teachers—three at the Pre-K/elementary level, one at the middle school level, and three at the high school level. Not only are teachers and their students housed in three different physical locations, but they are also responsible for reporting to two administrators—the principal at the public school where they are housed and Diane Poage, ASSDHH supervisor and Anchorage School District's director of Related Services.

Teachers serve between 40 and 50 students ranging in age from 3-21, many of whom have been diagnosed with multiple disabilities. Several of our older students come from rural villages and reside away from their parents at the Student Learning Center. In addition to these complex demographics, teachers face the Alaskan weather. Snow from October to April, often sub zero temperatures, and only six hours of daylight in the darkest months highlights and reinforces a physical, geographic, and professional isolation from deaf education programs and colleagues in the lower 48 states. As Kim Mongeau, a 21-year ASSDHH teacher, acknowledges: "Providing education to deaf and hard of hearing students in Alaska is like teaching on an island or in another world. We historically have been isolated not only geographically but also from one another."

In March 2010, we embarked on a journey to respond to the demands of NCLB. Knowing where to focus our efforts to increase student performance and achievement levels was time-critical, and we decided to rely on post-NCLB research in general education that attempted to pinpoint best teaching practices. We turned to findings that positively impacted classroom instruction and improved student achievement, findings from Marzano, Pickering, and Pollock's (2001) *Classroom Instruction that Works* and Marzano, Pickering, and Heflebower's (2011) *The Highly Engaged Classroom*, Wiggins and McTighe's (2005) *Understanding by Design*, Stiggins's (2001) "assessment literacy" efforts, and Washington State's Powerful Teaching and Learning Commission (see *www.bercgroup.com*, August

Photos courtesy of Jennifer Sees

Above & left: Clark Middle School ASSDHH students work in groups for hands-on science activities, including figuring out instructions, building a small vehicle, and assembling a battery-powered helicopter.

2010). We ultimately used Marzano's (2003) findings in *What Works in Schools: Translating Research into Action* to focus on factors that most affected student achievement. Consequently, while the Anchorage School District simultaneously initiated a year-long strategic planning process for the ASSDHH, ASSDHH teachers were asked to embrace, with the support of a professional development coach, the following research-based, three-pronged approach:

1. Infusion of classroom-based teaching and learning practices
2. Insistence on individually tailored professional development
3. Implementation of student progress monitoring

Best Teaching and Learning Practices

Our first goal was to identify and communicate best teaching and learning practices that teachers could infuse and incorporate into their classroom instruction. We took several steps:

- We asked teachers to create their own individualized lesson plans for each of our students and held them accountable for filling them out daily.
- We established non-evaluative classroom observations and feedback sessions.
- We developed nine accountability measures based on a wide variety of research and intuitive understanding. (See Table 1.)

Year One

Accent on Professional Development

During the first year, we designed a course for college credit that allowed teachers to personalize individual instructional goals. They were held accountable for those goals during monthly reflections and classroom observations. Mongeau reflects: *"Although it is a difficult and humbling endeavor to honestly examine one's teaching practices after many years in the profession and to admit weaknesses due to lack of recent and specific professional development, the rewards of doing so far outweigh the feelings of inadequacy when the improvements to the professional and the subsequent benefits to the students' learning are so remarkably obvious"* (personal communication, January 3, 2012).

At the beginning of the next year, individual Teacher Growth Plans were created so that ASSDHH teachers could meet with both of their administrators as well as their professional development coach to articulate specific and personalized professional development, including curricular, instructional, and assessment goals. Additionally, classroom observation and feedback session requirements were reduced so that they

TABLE 1.

Elements of Good Teaching

Alaska State School for the Deaf and Hard of Hearing

ELEMENT	GUIDING QUESTION FOR TEACHERS
Identifying and Communicating Student Objectives	Are you clearly identifying and communicating a maximum of three Grade Level Expectations student objectives prior to instruction?
Personalized Learning (to include differentiated instruction)	Are you taking into account diverse learner needs and working to fulfill each individual student's potential within his or her appropriate zone of proximal development (Vygotsky, 1978, p. 86) by intentionally addressing and meeting specific student needs?
Student Engagement (interest and participation)	Are you creating an interactive, risk-taking classroom atmosphere that produces attentive, interested, and involved students?
Variety of Teaching Delivery (methods/strategies)	Are you teaching and sharing information, promoting learning, and facilitating exploration by using an assortment of instructional approaches that reflect current brain-based research and honor a diversity of learning styles?
1/3, 1/3, 1/3 Model of Instruction	Are you structuring your lessons to equitably embrace whole group, small group, and individual instruction?
Maximizing Instructional Time (and purposefully managing the clock)	Are you adhering to prescribed time chunks that allow you to intentionally maximize your instructional efforts by using the entire class/lesson time?
Chunking Information	Are you prioritizing your lesson content into reasonable amounts of information, allowing for individual and group processing time, and graphically organizing content so as to promote long-term retention?
Use of Informal and Formative Assessment	Are you consistently checking for and monitoring student understanding and providing documented evidence that students have or have not mastered specific teaching objectives?
Providing Closure	Are you planning adequate time to review and summarize the lesson so as to complete the circle of learning that was initiated with the introduction of the student objectives?

Designed by Jennifer Sees

occurred quarterly.

Given our remoteness in Alaska, we have used technology to seek out and build "small group" connections with peers in deaf education in the lower 48 states. In fact, we facilitated two different "meet and greets" over the course of the last two school years—one with a K-8 literacy specialist from the Maryland School for the Deaf, Columbia campus, and one with content experts in language arts, math, and science from the Model Secondary School for the Deaf in Washington, D.C. We hope that our teachers will be able to establish long-term, professional, small group connections with these deaf education colleagues who face similarly high expectations for student achievement.

Mongeau affirms the importance of these opportunities: *"The opportunities through technology and through our commitment to meet have been invaluable as ways for us to brainstorm solutions, compare materials, practice strategies, and support and validate one another's efforts"* (personal communication, January 3, 2012).

Over that two-year period, our efforts shifted purpose. Teachers implemented formative assessments within their classes and submitted samples of students' formative assessments monthly. Marzano's (2010) *Formative Assessment and Standards-Based Grading: Classroom Strategies that Work* provided guidance, and we were fortunate enough to send a contingency of five teachers to Fairbanks for a Marzano group-led conference on common assessment. Our focus was comprehension and appreciation for how formative assessment not only demonstrates whether students actually learned what they were supposed to have been taught, but provided a guide to inform future classroom instruction.

After familiarizing our teachers with the idea of non-negotiable teaching elements during the first year of our intensive research-based approach, we provided support for expanding teachers' repertoire of specific classroom instructional methods and strategies in the second year. Our whole group approach to faculty meetings was altered by scheduling a monthly collaborative Book Study—similarly offered for college credit—devoted both to building high standards of quality teaching and collaborative collegial relationships. Throughout the 2011-2012 school year,

we read, discussed, and applied information from the following three books: *Evidence-Based Practice in Educating Deaf and Hard-of-Hearing Students* by Spencer & Marschark (2010); *Classroom Instruction that Works: Research-Based Strategies for Increasing Student Achievement* by Marzano, Pickering, and Pollock (2001); and *The Strategic Teacher: Selecting the Right Research-Based Strategy for Every Lesson* by Silver, Strong, and Perini (2009). We have additionally used this opportunity to re-familiarize ourselves with the 6+1 Trait Writing Model.

Ongoing Challenges

Implementation of Student Monitoring

Like teachers in the other states, Alaska's teachers of deaf and hard of hearing students continually improvise, adapt, and overcome challenges posed by their state-adopted general education curriculum as they work to fulfill NCLB requirements and improve teaching. As we work towards personalizing and differentiating grade-level expectations in Alaska, we have decided that one of the most important ways we can help our teachers successfully demonstrate student growth is to develop and use a Student Learner Profile to monitor and track student learning.

The main purpose of the Student Learner Profile is to document and showcase evidence of student achievement using pre-post assessments, Grade Level Expectations checklists, best work, and portfolio submissions. We believe that creating this type of database will prove vital in our standards-based era. Our hope is that the Student Learner Profile will not only equip us with the ability to improve our vertical alignment efforts, but also provide us with the means to show, with quantifiable data, that our students are indeed closing the gap. Indeed, our mission has always been to "gain as many 'years' as possible" with each year of instruction for our students who often perform below grade level. With the creation of the Student Learner Profile, ASSDHH teachers have the resources to document, track, and adequately communicate these authentic strides. Now, regardless of where our students perform relative to the grade level of their hearing peers, the Student Learner Profile will help us prove to national, state, and district level entities—as well as to parents and our local community—that our deaf and hard of hearing students are indeed learning, improving, and achieving.

As Alaska's teachers of deaf and hard of hearing students persist in responding to NCLB requirements, we will continue to rely on current research to inform our best teaching and learning, professional development, and student progress monitoring. We will also maintain our established commitment to a communicative, collaborative, respectful learning community dedicated to quality-focused deaf and hard of hearing student achievement.

References

Marzano, R. J. (2003). *What works in schools: Translating research into action*. Alexandria, VA: ASCD.

Marzano, R. J. (2010). *Formative assessment and standards-based grading: Classroom strategies that work*. Bloomington, IN: Marzano Research Laboratory.

Marzano, R. J., Pickering, D. J., & Heflebower, T. (2011). *The highly engaged classroom*. Bloomington, IN: Marzano Research Laboratory

Marzano, R. J., Pickering, D. J., & Pollock, J. (2001). *Classroom instruction that works: Research-based strategies for increasing student achievement*. Alexandria, VA: ASCD.

Mongeau, K. (2012, January 3). Personal communication.

Silver, H., Strong, R. W., & Perini, M. J. (2009). *The strategic teacher: Selecting the right research-based strategy for every lesson*. Upper Saddle River, NJ: Pearson Education, Inc.

Spencer, P. E., & Marschark, M. (2010). *Evidence-based practice in educating deaf and hard-of-hearing students*. New York: Oxford University Press.

Stiggins, R. J. (2001). *Student-involved classroom assessment* (3rd ed.). Upper Saddle River, NJ: Prentice Hall, Inc.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Wiggins, G., & McTighe, J. (2005). *Understanding by Design* (expanded 2nd edition). Alexandria, VA: ASCD.

Resources

Brectel, M. (2001). *Bringing it all together: Language and literacy in the multilingual classroom*. Carlsbad, CA: Dominie Press.

Fisher, D., & Frey, N. (2007). *Checking for understanding: Formative assessment techniques in your classroom*. Alexandria, VA: ACSD.

Guskey, T. R. (Ed.). (2009). *The teacher as assessment leader*. Bloomington, IN: Solution Tree Press.

Personalized learning model. (2003). Vancouver, WA: Vancouver School District.

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BRINGING LANGUAGE TO LIFE

quest's theatrebridge enhances learning in class

By Tim McCarty and Linda Delk

In math, students and teachers toss tennis balls. In science, students become rain, hail, sleet, and snow. In language arts, students maneuver their bodies into related positions and hold into a frieze they call "tableau." The students and teachers are part of TheatreBridge, a four-year model demonstration and dissemination program lead by Quest Visual Theatre, a nonprofit company based in Lanham, Maryland. Activities from TheatreBridge feel like play, but whether the students are in math, science, or language arts, the learning from TheatreBridge is deeply serious.

ThatreBridge builds upon the growing body of research that supports integrating arts and learning in the classroom. Catterall, Chapleau, and Iwanaga's large scale landmark analysis of the National Educational Longitudinal Survey (NELS '88) found "positive academic developments for children engaged in the arts." Further they noted "comparative gains for arts-involved youngsters generally become more pronounced over time" (Catterall, Chapleau, & Iwanaga, 1999, p. 2).

Podlozny's (2000) meta-analysis of research on the use of classroom drama and verbal skills revealed a positive relationship between the use of drama to act out stories and scores on written tests of story comprehension. Podlozny concluded: "[When students] are actively engaging in the texts they are reading, becoming more physically involved in the process of deciphering meaning from texts, … it appears that this engagement transfers to some degree to general reading ability" (p. 254).

Page's (2002) study of arts integration, considered an anchor in the research on use of

Photos courtesy of Susan Maginnis

drama for academic instruction, concluded that "children are more engaged during dramatizations than when just listening,…and [that] several key ingredients of story understanding are better conveyed through drama: main idea, character identification, and character motivation. These are essential elements of comprehension" (Deasy, 2002, p. 34). Dwyer (2011) affirms this, finding: "[Recent studies] have also demonstrated particular benefits from arts integration for economically disadvantaged students and English learners in the form of reading achievement gains—not surprising given the similarities between effective language instruction techniques and visual arts and theatre skills" (p. 19).

Principles, Assumptions, and Effective Teaching

TheatreBridge applies the principles and strategies of visual theatre to classroom instruction. The essential meaning of visual theatre transpires through what theatre lovers refer to as "a visual vernacular," (i.e., the language of how we move and what we see). Performers communicate information, relationships, and emotions primarily through movement, such as traditional mime, various forms of dance, puppetry, mask, sign language, gesture, video, or the circus arts. Visual theatre is not necessarily silent. It may contain spoken words, music, or other sounds. Through engagement in visual theatre, students bring their own ideas and interpretations to a text, idea, or theme.

By applying visual theatre modalities and strategies, TheatreBridge supports visually and kinesthetically based instruction that is culturally appropriate for deaf and hard of hearing students. It creates a learning environment that is more fully accessible to deaf students, consequently laying a foundation for success in school. Visual theatre allows students with limited language skills to develop theatre and communication skills without the barrier that language often presents. In non-theatre classrooms, teachers can use visual theatre process—and the visual vernacular:

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The authors welcome questions and comments about this article at *Tim@quest4arts.org*. and *Linda.Delk@gmail.com,* respectively.

- To enhance learning readiness
- To visually interpret ideas and themes that the students are studying
- To allow students to bring their own ideas and interpretations to a text, idea, or theme
- To visually interpret written English that the students are studying
- To develop a bridge between visual understanding and comprehension of English text

Expression, Collaboration, Feedback—and Handling Social Relationships

A recent white paper on framing a national research agenda for the arts, lifelong learning, and individual well-being summarized research on the benefits of arts education. The paper states that young children who participated in arts-integrated preschool grew more developmentally in multiple domains, including social relations, creativity, movement, language, and literacy, than did children in programs without an arts focus (Hanna, Patterson, Rollins, & Sherman, 2011, p. 8). Unlike text-based theatre where performers work from a given script, visual theatre is collaborative, open-ended, and exploratory. The

Above: Students participate in TheatreBridge activities.

Quest and TheatreBridge—A Look at the Program

TheatreBridge's goals are to strengthen teachers' standards-based arts instruction, increase opportunities for deaf and hard of hearing students to engage in arts-integrated instruction and other visual theatre activities, and improve the academic skills of students, particularly in literacy.

Two key assumptions underlying TheatreBridge are that standards-based theatre arts instruction engages students more directly in learning theatre process and production skills and that use of visual theatre strategies in instruction enhances literacy learning. TheatreBridge begins with engaging teacher interest in arts-integrated instruction, providing teachers with the professional development and ongoing assistance to effectively integrate visual strategies into their instruction.

TheatreBridge's Teacher/Artist Institute is a one-week training for teachers, classroom aides, and teaching artists. Participants are provided with training in visual theatre and arts integration. They work in teams to develop mini lesson plans that they teach to their peers at their home institutions. In addition to developing arts-integrated lesson plans based on state standards, TheatreBridge teachers learn to use a rubric to assess, monitor, and target students' developing theatre skills.

The staff of Quest serves as mentors throughout the school year for participants. Mentors and teachers brainstorm ideas for visual theatre integration strategies. The mentors also serve as a sounding board for the teachers and master teach upon request. Participants meet every six weeks to review their progress and meet twice a year for half-day trainings in visual theatre. In addition to improving instruction, this process supports the development of classroom-tested, high quality, standards-based lesson plans that are shared with other teachers through Quest's website.

Elementary students attend a one-week day camp at their school. Each year the camp has a different theme. Last year, students read stories about pirates in a room chock full of pirate sets and props. The students explored vocabulary and narrative, created scenes from a pirate storybook, and produced a pirate-themed movie. The instructors, educators from the Maryland School for the Deaf (MSD), Columbia campus, guided the students in creating a "pirate culture," complete with their own Constitution for governing group behavior and expectations. The teachers engaged students in exercises to learn use of movement and physical expression, focus, group cooperation, characterization, and imagination. These skills were then applied to enacting a story from a book they had read about good and bad pirates. The emphasis was on comprehension of the narrative and using it as the stimulus for creating visual theatre. The instructors also used a story about pirates to work with the students to create a movie using a model pirate ship and small pirate figures. The students used a digital camera to arrange and photograph the tiny pirate figures and model ship, frame by frame in a storyboard,

actor's body becomes the primary means of communication with the audience. In visual theatre, composing a piece starts with a context and the question, "What if…?" Students explore this question using problem solving and creative processes executed through the medium of physical expression. The physical interpretation of a story or text requires students to analyze the printed English, determine its important points, and then through the use of their bodies share their visual interpretation with their peers. This—translation, physical interpretation, performance—requires clarity, precision, commitment, appropriate timing, and focus.

Visual theatre composition also depends on active listening and observing, clear communication, and appropriate responding. Students watching a visual interpretation presented by their classmates must actively observe and then provide concrete and constructive feedback. Students receiving the feedback may only listen and not comment on their peers' remarks. This process encourages the students to pay careful attention. If the students respond during feedback, they are preparing their defense while the critique is happening and, therefore, they are not fully listening or, if the feedback is through signs or lipreading, they are not fully observing. Remaining attentive during the feedback process helps students accept criticism. After receiving the feedback, the performing students may choose to ignore it or incorporate it into their presentations during their next draft. TheatreBridge views self-evaluation and peer critique as essential to developing the students' collaborative skills. This collaborative approach is also a vital part of the students' overall learning process.

Enhancing Understanding—A Strategy of Tableau

Creating "tableaus," that is having students essentially form positions in which their bodies illustrate an idea or event drawn from a text, is one of the activities that the Maryland School for the Deaf (MSD) teachers and students have effectively incorporated into their classes. Tableaus, emphasizing position, motion, expression, and collaboration have been woven into a myriad of lesson plans in various subjects that form MSD's core curriculum. For example, in a second grade MSD science class, students learn about nature's life cycles and specifically study the life cycle of a frog. Using toys, puppets, and flashcards, the teacher introduces the students to vocabulary, such as *frog*, *tadpole*, and *eggs*. The students and teacher each have an opportunity to manipulate the objects and discuss what

portraying scenes from the story. The week concluded with a showcase in which the students presented their pirate play and showed their completed movie to family and school staff members.

Middle school students attend a two-week residential institute held at Gallaudet University in Washington, D.C. "All About Me" was last year's institute theme. Students created their own "self" dance based on visual interpretations of things that were important to them. The students presented a showcase performance for their families and other Gallaudet summer program students.

Teachers and administrators repeatedly noted that those students who participated in TheatreBridge's summer programs showed a greater degree of confidence, risk taking, and skill in communication than those students who did not attend the program. They also noted that their students were able to focus more in class.

TheatreBridge extends engagement in theatre arts activities beyond the classroom. Students have increased opportunities to engage in after-school theatre arts and out-of-school family engagements in the arts. Increased engagement, both in and out of school, in arts-related activities has positive effects on students' communication, social interaction, self-confidence, and motivation to learn, contributing to increased academic achievement (Burnaford, Brown, Doherty, & McLaughlin, 2007, p. 102).

TheatreBridge provides funding for in-school and off-site performances and experiences that are culturally appropriate for and accessible to deaf and hard of hearing students and their families. The engagements provide parents with a greater understanding of the connection between visual theatre and their children's academic and social growth. This year and in 2014 Quest will present QuestFest, a two-week international visual theatre festival produced in partnership with Gallaudet University, Joe's Movement Emporium, the Baltimore Theatre Project, and Creative Alliance. QuestFest involves students, teachers, parents, and artists in performances, residencies, and workshops.

TheatreBridge is a partnership between Quest, MSD, and Gallaudet University. The United States Department of Education's Arts in Education program provides most of its funding. In the spring, Thomas Claggett Elementary School, a mainstream program in Prince George's County, Maryland, will join the TheatreBridge team.

If you would like more information about TheatreBridge, contact Quest at *info@quest4arts.org*. If you would like more information about arts integration and research focusing on arts education, an excellent resource is the website for the Arts Education Partnership (*www.aep-arts.org*). The site includes a number of publications, and most are available in free, downloadable formats.

they know about each vocabulary word. Then the class moves to a different section of the room where the teacher shows a brief animated film of the frog's life cycle. The students discuss the film, and the teacher assists the students in using the vocabulary they have just learned. Finally, the teacher projects a series of pictures depicting the frog's life cycle, and the students create a tableau for each picture.

The teacher takes a photo of each tableau, reflecting the students' interpretation of each picture. The teachers and students will use these photos in a number of ways throughout the unit. Sometimes the teacher projects the picture and the students explain what is happening. Sometimes the teacher and students create sentences to caption their photos. This important process enables the students to develop a deeper understanding of the information about a frog's life cycle because of the active way learning takes place.

Teachers have been pleased with the result. "My students love doing the theatre activities," said MSD elementary school teacher Shannon Negussie. "Linking theatre games to the curriculum helps the students learn and retain information."

"TheatreBridge has given me a renewed enthusiasm for teaching," agreed middle school language arts teacher Susan Maginnis. "I come to school every day full of ideas for using the theatre games to support my lesson plans. I'm also using the games to develop my students' communication and interpersonal skills." By the end of the program, TheatreBridge will provide training to nearly all of MSD's instructional staff.

Tableaus can be used to create images found in literature, science, social studies, and other subjects. They freeze the action and allow the student and the viewer to look at the detail of what is being communicated. A good tableau requires the student to clearly understand what he or she is trying to communicate. The student must synthesize the essence of a topic's central idea and then translate it into a tableau or a series of tableaus. As students continue to work on the tableau technique, they develop a greater sense of their entire body, and they are able to create clearly defined images with their bodies. An actor, while moving on stage, has a sense of what he or she looks like from an audience's point of view. A good multi-person tableau has either a central focal point or a central theme. When audiences look at tableaus, they should be able to decipher—or read—the image. The precision of the images requires a commitment to the goal. For both theatre and other content areas, student creators of tableaus require an ability to synthesize that information and to create images that connote the topic or goal. Assessment by audience members also requires these higher level skills.

Other teachers have used tableaus to depict such things as George Washington crossing the Delaware River, types of weather, addition, and subtraction. One class created a storybook of Thanksgiving that included tableaus that the students created showing traditional Thanksgiving scenes. Teachers can share such storybooks with parents by posting the story online, making a CD, or printing out the story and binding it.

Tableaus are just one of the effective strategies embraced by teachers who use visual theatre in their classrooms. All of the strategies enable students to develop self-confidence while they improve their knowledge of literacy, math, science, or any of the core subjects within their curriculum.

References

Burnaford, G., Brown, S., Doherty, J., & McLaughlin, H. J. (2007, April). *Arts integration frameworks, research & practice: A literature review.* Washington, DC: Arts Education Partnership.

Catterall, J. S., Chapleau, R., & Iwanaga, J. (1999). Involvement in the arts and human development: General involvement and intensive involvement in music and theater arts. In E. B. Fiske (Ed.), *Champions of change: The impact of the arts on learning*. Washington, DC: The Arts Education Partnership and The President's Committee on the Arts and the Humanities.

Deasy, R. J. (Ed.). (2002). *Critical links: Learning in the arts and student academic and social development*. Washington, DC: Arts Education Partnership.

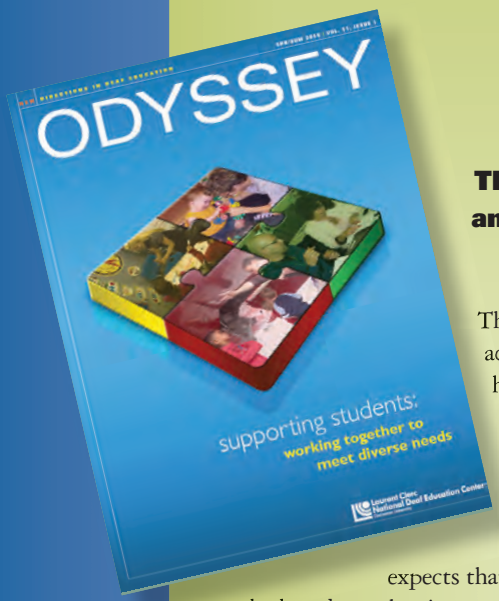
Dwyer, M. C. (2011). *Reinvesting in arts education: Winning America's future through creative schools*. Washington, DC: President's Committee on the Arts and the Humanities.

Hanna, G., Patterson, M., Rollins, J., & Sherman, A. (2011, November). *The arts and human development: Framing a national research agenda for the arts, lifelong learning, and individual well-being*. A white paper based on "The Arts and Human Development: Learning across the Lifespan," a convening of the National Endowment of the Arts and the U.S. Department of Health and Human Services. Washington, DC: National Endowment for the Arts and the U.S. Department of Health and Human Services, March 2011. Retrieved January 14, 2012, from *www.nea.gov/research/TaskForce/Arts-and-Human-Development.pdf*

Page, A. (2002). Children's story comprehension as a result of storytelling and story dramatization: A study of the child as spectator and as participant (doctoral dissertation, 1983, University of Massachusetts, University Microfilms International). In R. J. Deasy (Ed.), *Critical links: Learning in the arts and student academic and social development*. Washington, DC: Arts Education Partnership.

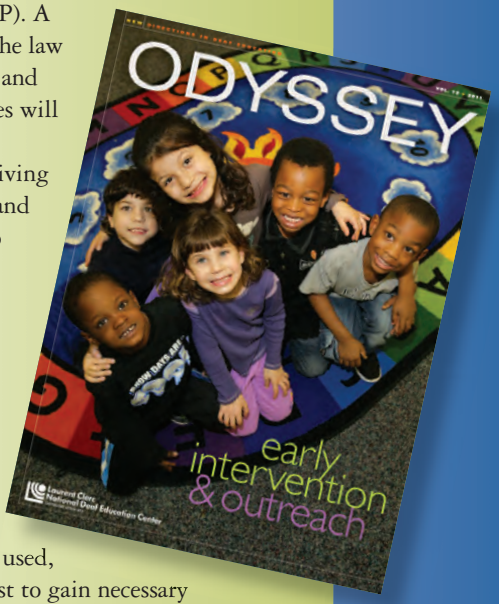
Podlozny, A. (2000, Autumn-Winter). Strengthening verbal skills through the use of classroom drama: A clear link. *Journal of Aesthetic Education, 34*(3/4), 239-275.

Seeking Submissions for the 2013 Issue of Odyssey



THEME: Accessing Appropriate Special Education and Related Services—Successes, Challenges, and Stories

The 2013 issue of *Odyssey* will focus on the challenges and successes of acquiring services and support to meet the unique needs of deaf and hard of hearing students. Under the Individuals with Disabilities Education Act (IDEA), deaf and hard of hearing students are entitled to receive a free appropriate public education based on their Individualized Education Program (IEP). A key word in this process is *individualized*. The law recognizes that the needs of students differ and expects that the decisions made about educational services will be based on what is appropriate for each student. The responsibility to ensure that students are in an effective educational setting and are receiving the necessary services falls to a collaboration among schools, agencies, and parents in the form of an IEP team. This team has the responsibility to consider the child's needs within a range of services that includes a continuum of educational settings and educational supports which, in combination, should provide the free appropriate public education intended by the IDEA. While many students with disabilities have their needs effectively met, all too often deaf and hard of hearing students do not have access to the services and support needed. In these situations, parents and/or professionals may have to advocate for a child to gain access to the full range of services.



The Clerc Center seeks articles from parents and education professionals sharing their stories and experiences—the strategies they used, the challenges they faced, and the outcomes they achieved in their quest to gain necessary services and supports for their children or students. The Clerc Center is particularly interested in articles about experiences serving deaf and hard of hearing students from traditionally underserved groups, including those students who:

- Are lower achieving academically
- Come from families that speak a language other than English in the home
- Are members of diverse racial or cultural groups
- Are from rural areas
- Have secondary disabilities

Please e-mail your ideas to *Odyssey@gallaudet.edu* by September 1, 2012; fully developed articles are due by October 1, 2012. We also welcome shorter news articles about programs, activities, or educators and other professionals who have had an impact on deaf and hard of hearing students. Contact us via e-mail at any time with questions or to discuss your ideas.

CHARACTERISTICS OF AN

effective writing literacy program

By Candi Mascia Reed

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Learning to write is an arduous undertaking for every student; for deaf and hard of hearing students, it can be particularly difficult. Too often, they arrive in school with minimal literacy skills, experience subsequent difficulties in writing standard English, and, unfortunately, still graduate with reading levels below those of their hearing peers (Commission on Education of the Deaf, 1988; Johnson, Liddell & Erting, 1989; Quigley & Paul, 1990; National Agenda, 2005).

After teaching Writing Workshop and English courses to deaf and hard of hearing students for 25 years, I decided to focus my doctoral dissertation on the shared characteristics of writing programs. I did a qualitative study, used summative evaluations, and collected data from three kindergarten through grade six programs. Each program had instruction in small-group classes with a teacher of deaf and hard of hearing students; however, educational placement and mode of communication varied significantly:

- **School #1 (Total Communication)**: This was a day school located in a suburb of New York. The school did not have a partnership with any local school district; therefore, no students were placed in mainstream classes with hearing peers. However, the school had joined in a Literacy Collaborative Partnership with a neighboring university.
- **School #2 (oral/aural only)**: This was a day school housed in a host school site in a suburb of New Jersey. It included teachers of deaf and hard of hearing students who worked with general education teachers in mainstream classes as well as a few small group classes of deaf and hard of hearing students. While the teachers of deaf and hard of hearing students in mainstream classes were afforded some writing literacy interactions with the host school's general education teachers, those teachers of deaf and hard of hearing students who taught small group classes were afforded much less interaction.
- **School #3 (ASL, auditory/oral, special needs)**: This was a private, state-supported school located in a suburb of New York. In 1991, the school had adopted a bilingual-bicultural instruction model, and in 2002 an auditory-oral pre-school program was added. Educators in School #3 provided three programs for deaf and hard of hearing students: an ASL program, an auditory/oral program, and a special needs program.

Photos courtesy of Candi Mascia Reed

Right: Students in the pre-kindergarten/kindergarten class celebrate Dr. Seuss's birthday with their own stories about the Cat in the Hat.

A review of the literature in general education and deaf education, federal initiatives in promoting student writing, program evaluation, and leadership characteristics led to the formation of a conceptual base for my research. I would explore shared literacy standards through a theoretical framework guided by the following:

- **SCHOOL CULTURE, VALUES, AND BELIEFS:** *What are some of the behaviors, customs, and beliefs in a school community that would promote and sustain a writing literacy program?*
- **ACADEMIC QUALITY:** *What curriculum components, practices, and assessments used by educators in school communities address writing literacy that fit the needs of students in that community?*
- **PROFESSIONAL DEVELOPMENT:** *How should professional development prepare teachers to meet the writing literacy needs of students?*
- **TECHNOLOGY IN LITERACY:** *How might wireless technology enhance the writing performance of students?*
- **PARENT/FAMILY INVOLVEMENT AND TRAINING:** *How can educators encourage parent/family involvement to help develop student writing abilities?*

Left: Author for a Writer's Workshop, a student shares his writing with his peers.

- **ASSESSMENT PRACTICES:** *How are student data and assessment practices used to assess writing literacy in school communities?*

I interviewed school administrators, teachers, and staff members, including a literacy coach in School #1. I observed and video-recorded teachers during writing instruction in the classroom, using an observation guide to document my observations. I collected documentation of student writing, assessment pieces, and background historical information. This helped me understand the philosophy and culture of each school.

Perspectives of Teachers and Administrators
A Summary of Findings

An analysis of the data derived from administrator and teacher interviews indicated that the dominant themes and shared characteristics that influenced writing programs across the three school sites were:

- A school culture supporting writing literacy
- Diversity of the student population and student needs
- Professional development needs
- Assessment practices
- Teaching English grammar
- Concerns with lack of parent/family involvement in promoting writing literacy

Changing Our Schools
From Research to Practice

In the Bergen County Special Services School District Programs for the Deaf, pre-kindergarten through grade 12, in Hackensack, New Jersey, we focused for one year on one of the research findings from this study. We wanted to establish school cultural values and beliefs necessary for establishing an effective writing program. In addition, we developed a School Action Plan to closely monitor other areas addressed in the study, including:

- The needs of students with additional disabilities and cultural/educational diversity of the student population
- Ongoing assessment and documentation of change in students' writing ability
- Implementation of successful professional development practices
- Teaching of written English grammar
- Encouraging parent/family involvement in promoting student writing literacy

Pre-kindergarten Through
Eighth Grade Changes

The pre-kindergarten through eighth grade program at the Union Street School, where our program for deaf and hard of hearing students is located, uses the Hackensack School District curriculum. The Hackensack School District re-designed and re-evaluated its writing literacy program recently due in part to the impending implementation of the National Common Core Standards (*www.corestandards.org*). We adapted Hackensack's Writer's Workshop Curriculum, and teachers of deaf and hard of hearing students were trained along with the general education teacher population. Nevertheless, the school culture, values, and beliefs about the importance of teaching writing needed to be fortified so that classroom practices and approaches to writing development specific to our deaf and hard of hearing students could be implemented.

Last year, after establishing specific measurable, attainable, and realistic goals, educators and administrators in the pre-kindergarten through eighth grade program designed a timetable to establish a stronger, more effective school culture to support teaching and assessing student writing. This year we have focused on the practices identified in the study. As a result:

- Staff meet each week in an Assessment Professional Learning Community (PLC) to discuss student writing and review and analyze writing curriculum across grade levels.
- Staff use a single pre- and post-assessment from the *Starting With Assessment* writer's toolkit (French,1999).
- Student writing is prominently displayed throughout the building.

- Teachers have become more consistent in using curriculum-based language related to writing instruction across grade levels.
- Staff have designed an in-house Student Assessment Profile Page for each student that shows—in addition to pre- and post-reading and math assessment scores—a pre- and post-writing assessment score, formative assessments, and strategies used throughout the school year as well as end-of-year assessment results.
- The Parent Teacher Organization includes topics specific to helping parents use writing as a communication and literacy tool within their homes in bi-monthly Saturday meetings.

High School Changes

Changing the culture, values, and beliefs about writing at the high school level proved difficult. Deaf and hard of hearing students attend Hackensack High School, where they are placed either in mainstream general education classes or in resource, small group classes with hearing students and a special education teacher. Working in tandem with general education and special education teachers, teachers of deaf and hard of hearing students provide consultation to the teachers and modifications and accommodations for students. In addition, they pre-teach, re-teach, and support concepts for all subjects in mandatory Study Skills classes as well as provide small-group instruction for English Lab classes that strengthen concepts learned in general education and special education English classes.

In the face of this structural difficulty, our teachers and staff members met to establish policies and practices in writing literacy and assessment for our high school students. Agreeing that they needed to support student writing and not just relegate that to the general or special education teacher, the teachers and staff members developed a plan that specifically addressed student writing literacy and assessment, and aided in organizing and developing the initial phases of promoting and sustaining a school culture, values, and beliefs specific to writing literacy.

This plan, first implemented last year, incorporates the collection of high school students' writing samples, using both curriculum-based and performance-based writing assessment measures, providing more professional development to general education teachers, initiating a student-driven and student self-assessed writing portfolio, and delineating individual student interventions based on assessment analysis of student writing.

Looking Across Program Needs Pre-kindergarten Through 12th Grade

When teachers in both Hackensack Programs for the Deaf meet in an Assessment PLC, they work hard as they dialogue about the issues that drive their instruction, challenge students, and address the diversity of academic levels among students. Lively and thoughtful conversations enable teachers to share ideas, practices, and resources about teaching writing, English grammar, and vocabulary and replace teacher isolation and uncertainty.

The Assessment PLC in the high school reviews the writing curriculum used in the high school for students in mainstream English classes and students in resource rooms with special education teachers. Consultant teachers of deaf and hard of hearing students administer pre- and post-writing assessments and, this year, the staff members will meet to determine additional assessment practices. With the data collected on their students' writing, the consultant teachers will share the assessment results with the mainstream teachers, continuing to provide modifications and accommodations to students based on their needs but with stronger and more informed data to guide their support.

Our effort to re-evaluate and re-vitalize teachers' understanding of their work with writing literacy is helping to improve instruction at all levels. It's also helping to provide a sense of community for hardworking teachers of deaf and hard of hearing students.

Literacy Programs: Recommended Practices

The following practice recommendations are suggested for administrators and educators. The implementation of these recommendations will address promoting writing literacy in a school community regardless of educational placement or communication methods (Mascia Reed, 2009).

- Establish a school-site writing literacy program aligned to the National Common Core Standards across grade levels.
- Establish guidelines for a purposeful school community, specifically on expectations for school culture, values, and beliefs about writing literacy and the school's writing literacy program.
- Establish a school-wide plan to implement a writing literacy program that will address the individual needs of a diverse student population.
- Establish Writing Literacy Leadership Teams or PLCs for shared decision making on the school's writing literacy

program, including curriculum, materials, and assessment across all grade levels.

- Establish a school-site data-management system to provide timely and reliable information that displays individual student academic growth in writing literacy.
- Provide ongoing professional development on classroom-based formative assessment, monitoring tools that are teacher and student friendly.
- Establish opportunities for school-site professionals to share knowledge, skills, and attitudes specifically on writing intervention strategies.
- Provide ongoing professional development to teachers on computer technology and writing literacy.
- Provide ongoing professional development to teachers of students with additional disabilities.
- Develop action-research projects as professional development activities.
- Establish opportunities for school-site professionals to share knowledge, skills, and attitudes specifically on writing intervention strategies.
- Establish a Family Literacy Focus Group that includes information to parents and families on school-wide culture, values, and beliefs about writing literacy as well as parent/family interventions for working with students on writing skills.

For the complete dissertation, see PROQUEST #3405455 or visit http://scholarship.shu.edu/dissertations/246.

References

Commission on Education of the Deaf. (1988, February). *Toward equality in the education of the deaf*. Retrieved September 1, 2008, from *http://archive.gao.gov/t2pbat17/135760.pdf*

French, M. (1999). *Starting with assessment: A developmental approach to deaf children's literacy*. Washington, DC: Gallaudet University, Pre-College National Mission Programs.

Johnson, R., Liddell, S., & Erting, C. (1989). *Unlocking the curriculum: Principles for achieving access in deaf education*. Washington, DC: Gallaudet University, Gallaudet Research Institute.

Mascia Reed, C. M. (2009). *ASL, Total Communication, and Oralism: Identifying shared characteristics of school-based writing intervention programs for deaf and hard-of-hearing students, K-6*. Dissertation. Paper 246. May be retrieved from *http://scholarship.shu.edu/dissertations/246*

National Agenda. (2005, April). *The National Agenda: Moving forward on achieving equality for deaf and hard of hearing students*. Retrieved October 5, 2008, from *www.ndepnow.org/pdfs/national_ agenda.pdf*

Quigley, S., & Paul, P. (1990). *Language and deafness*. San Diego, CA: Singular Group.

Resources

Achilles, C. M. (2004). Change the damn box. In C. Carr & C. Fulmer (Eds.), *Educational leadership: Knowing the way, showing the way, going the way* (pp. 4-27). Lanham, MD: Scarecrow Education.

Bowe, F. (1991). *Approaching equity: Education of the deaf*. Silver Spring, MD: T. J. Publishers.

Luetke-Stahlman, B. (1998). *Language issues in deaf education*. Hillsboro, OR: Butte Publications.

Lytle, R., & Rovins, M. (1995). Reforming deaf education: A paradigm shift from how to teach to what to teach. *American Annals of the Deaf, 142*, 7-15.

Marschark, M., Convertino, C., & LaRock, D. (2006). Optimizing academic performance of deaf students: Access, opportunities, and outcomes. In D. Moores & D. Martin (Eds.), *Deaf learners: Developments in curriculum and instruction* (pp. 179-200). Washington, DC: Gallaudet University Press.

Marschark, M., Lang, H., & Albertini, J. (2002). *Educating deaf students*. Oxford, NY: Oxford University Press.

Marzano, R. J. Waters, T., & McNulty, B. (2005). *School leadership that works: From research to results*. Association for Supervision and Curriculum Development, VA, & Mid-continent Research for Education and Learning, CO.

Moores, D. (2001). *Educating the deaf: Psychology, principles and practices* (5th ed.). Boston: Houghton-Mifflin.

Power, D., & Leigh, G. (2011, Winter). Principles and practices of literacy development for deaf learners: An historical overview. *Journal of Deaf Studies and Deaf Education, 5*(1), 3-8.

Toscano, R. M., McKee, B., & Lepoutre, D. (2002). Success with academic English: Reflections of deaf college students. *American Annals of the Deaf, 147*(1), 5-23.

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Right: Petitto studies how the brain builds and understands human face-to-face conversations using two brain imaging systems for the first time.

REVOLUTIONS IN THE SCIENCE OF LEARNING:

a new view from a new center

visual language and visual learning

By Laura-Ann Petitto

Revolutions can happen in different ways. About six years ago, a very particular type of revolution began in a cluster of rooms on the main campus of Gallaudet University. There, a handful of individuals began a *quiet revolution* guided by an overarching passionate mission to conduct groundbreaking science that would have widespread benefits for education and society. Launched with a coveted award from the National Science Foundation, our Science of Learning Center—called Visual Language and Visual Learning, and affectionately referred to as VL2—became one of only six Science of Learning Centers established in the National Science Foundation's history.

One radical—indeed revolutionary—idea underlying VL2 is its existence as a virtual entity. Initiated by Dr. Thomas Allen, VL2's co-principal investigator and a professor in Gallaudet's Department of Educational Foundations and Research, with a team of outstanding deaf and hearing individuals on campus, the Center connects approximately 250 scientists, students, and educators spanning 15 laboratories in the United States and Canada, and over 90 schools, through a structure that is digital and a space that is cyber.

The purpose of VL2 is to advance the nation's knowledge of the science of learning by studying how aspects of higher cognition, language, and reading are

Photos courtesy of Laura-Ann Petitto

realized through one of our most central senses, the human eye. We advance a new perspective on human learning by using the widened vantage point of studying deaf individuals and signed language as an exciting new lens into the flexibility and structure of the human mind. We study monolingual and bilingual children and adults in order to promote optimal practices in education, both in and out of the classroom. VL2 has as its mission the development of rich translational outcomes as well as the promotion of *two-way*, mutually respectful communication among scientists and the greater community, parents, schools, and educational policymakers.

VL2 Center Advances in the Science of Learning

It is said that "good things come in threes" and, to summarize our Center's contributions thus far, I'll highlight three of its exciting scientific research advances. To stay true to our mission of translation, each of the three advances contains a *Tip for Teachers*. This is the "bottom line" translational and educational impact of this set of research discoveries. For us, what is critical is that teachers and parents be able to put our discoveries in research to use in furthering the understanding and advancement of all children, especially children and adults who are "visual learners." By way of a brief definition, I use the term "visual learner" for two reasons. First, I hope to underscore the fact that all humans are visual learners, and that knowledge from VL2 Center discoveries has the potential to be broadly applicable. A "visual learner" includes a hearing child learning spoken language, a deaf or hard of hearing child learning signed language, a child who is deaf with a cochlear implant learning speech, and all language combinations in between, with the children differing, of course, in the degree of their use of the visual modality. Because we have discovered rather remarkable ways in which young deaf children—especially those visual learners exposed to signed language—are advantaged in many critical higher cognitive functions, here I use the term "visual learner" and "deaf child" interchangeably. The second important reason that we at VL2 use the term "visual learner" is this: Rather than focusing on a child's disability (loss of hearing), we have been dazzled by how all children, especially deaf and hard of hearing children, learn through the visual pathways in advantaged ways when they've had very early exposure to signed language! Following my summary of three of the VL2 Center's scientific advances, I provide a summary of VL2's new translational products and the two-way communicative activities presently at our doorstep—with so much more to come!

What Research Tells Us

1. VISUAL EXPERIENCE CAN MEAN COGNITIVE ADVANTAGE

Our Center's studies of visual and cognitive plasticity reveal that different early sensory experiences do alter the human brain. Remarkably, increased visual sensory experience in the young deaf visual learner can alter the human brain in ways that, in turn, can afford stunningly higher cognitive advantages. Our VL2 research has shown that this is especially true if young visual learners receive early visual signed language. For example, VL2 researchers David Corina (University of California, Davis), Jenny Singleton (Georgia Institute of Technology), Rain Bosworth (University of California, San Diego), and others have found that early exposure to a signed language in young visual learners changes their visual attention processing which, in turn, has an "upstream" positive impact both on higher cognition and on social-emotional self-regulation. These early sign-exposed deaf infants attend more robustly to adult signers' faces and eye gaze as compared to deaf and hearing infants with little or no exposure to signed language. Infants exposed to signed language attend less to the hands and more to the direction and trajectory of the adult's eye gaze. In turn, this aids the infant in learning vocabulary rapidly. Here, the capacity to track adult eye gaze facilitates the infant in making connections between a given sign and its intended meaning. Related VL2 studies of older deaf toddlers during book reading with their signing parents have found that the toddlers' eye gaze tracking ability is indeed vital to early vocabulary, language, and literacy mastery, both in American Sign Language (ASL) and in English. Further, other Center researchers, including Keith Rayner and Nathalie Bélanger (University of California, San Diego) and Matthew Traxler (University of California, Davis), have discovered advantageous changes in visual processing in deaf adults who are skilled readers in English. Thus, an important consequence of exposing young visual learners to a natural signed language early in life is that it affords an advantaged visual capacity that facilitates the child's ability to achieve healthy and developmentally appropriate cognitive, language, and reading milestones.

Through synergistic collaborations, best made possible by being in a "Center," one team of VL2 researchers built upon the above findings from several of our labs and, in turn, asked whether parental training in ASL can facilitate communication in the home so that language and pre-literacy skills are in place for children prior to school entry. Here, they specifically train parents of young visual learners in the visual language of ASL as a direct tool to enhance their children's vocabulary acquisition as well as their overall language, reading, and literacy success.

Tip for Teachers: Early exposure to a natural signed language is highly beneficial to normal human language development and can impact the brain's visual attention systems in powerfully positive ways (e.g., by affording heightened visual attention that can result in cognitive, language, and reading processing advantages in the young visual learner).

2. BILINGUAL EXPOSURE CONFERS READING ADVANTAGE

The brain and behavioral studies of language development and bilingualism at VL2 have found that early exposure to a signed language—and, most importantly, early *bilingual exposure* to a natural signed language and a spoken language—afford cognitive and, newly discovered, surprising language and reading advantages over age-matched monolingual children and adults. (This finding holds for both deaf and hearing bilingual children.) These discoveries have emanated from the VL2 laboratories of Peter Hauser (Rochester Institute of

Technology), my own research laboratory, and other VL2 members. Notably the studies reveal that early bilingual signed and spoken language exposure provides linguistic processing strengths across both languages, and that access to a signed language *improves* a deaf child's performance in reading English. Moreover, early bilingual exposure affords the most robust and optimal lifelong cognitive and linguistic advantages over later dual or second language exposure.

Tip for Teachers: Early exposure to a natural signed language and, in particular, early exposure to two languages (e.g., ASL and English) are a societal and educational imperative for the young visual learner. Old fears of language contamination and/or language delay when exposing a child to two languages early in life are scientifically unfounded. Similarly, old fears that early exposure to a signed language will hurt deaf children's acquisition of a spoken language are also scientifically unfounded, as instead we find powerful language and reading advantages in deaf children exposed early and bilingually to signed and spoken language.

3. VISUAL LEARNERS REVOLUTIONIZE OUR VIEW OF BILINGUALISM AND THE ROLE OF "PHONOLOGY" IN EARLY READING

From our brain and behavioral studies of reading and literacy in visual learners comes a new view of bilingualism and a revolutionary understanding of how experiential change can impact the brain's structures and related functions. Emerging from VL2 research—for example, that of Jill Morford (University of New Mexico), Karen Emmorey (San Diego State University), David Plaut (Carnegie Mellon University), my own BL2 lab, and others—comes a new view of bilingualism as including young sign-exposed deaf children whose primary access to their other primary language is through printed text. Said another way, one language in the bilingual pair is accessed through a full natural signed language and the other, remarkably, through print alone. They are "bimodal-print bilinguals."

In the VL2 studies of good readers among the deaf ASL-English print bilingual children and adults, both neural and behavioral studies lay bare the brain's potential to develop alternative gateways to sound-based phonological representations typical of, for example, a young hearing reader's use of phonological representations to access meaning from the printed word. Among the multiple cues used by young hearing readers (phonological, orthographic, semantic, and syntactic), young signing deaf readers appear to be using the same multiple cues, including the phonological level of language processing. To be sure, there is now growing and very exciting evidence that visual learners also have—and use—a "phonological" level of language representation when accessing meaning from printed words. Here, young deaf readers are not directly accessing sound phonology when they derive meaning from a printed word such as "c+a+t." Instead, what's in the brain's phonological representations for visual learners appears to be more akin to visual units, such as bits of fingerspelling, and parts of rhythmic, phonetic-syllabic movements and hand configurations at the heart of signed language phonological and prosodic structure (see especially the studies and theoretical articulation of this topic by Petitto).

That the human brain creates a visually based phonological level of language processing in the absence of sound is stunning in itself and reveals the centrality of this level of language organization in all human language processing. It also forces us to re-conceptualize the nature of human language as we see core levels of language organization being pushed out onto the hands and the tongue irrespective of language modality. Moreover, that there is now insight into what "phonological" representations may consist of in the brains of visual learners and, crucially, what role these sign-based representations may play in the decoding of meaning from English print for visual learners is thrilling. It further suggests clear translational implications that we are pursuing at our Center. For example, inspired by this Center research, one VL2 team of researchers is training teachers in the use of fingerspelling in the classroom when teaching young deaf children to read English print. Here, fingerspelling is used as a gateway to building healthy sign-based phonological representations when teaching children how to read in English.

Tip for Teachers: The brain's natural propensity to establish and utilize an intermediate level of language organization—a level called *phonological* because it was once believed dependent on exposure to sound—appears to be universal to all human languages whether they are signed or spoken, auditory, or visual. Moreover, the brain's natural propensity to utilize this intermediate level of language processing when accessing meaning from printed text appears to be vital in the very early stages of reading acquisition, especially involving reading systems that have "deep" orthography, or non-direct (non-transparent) sound to letter

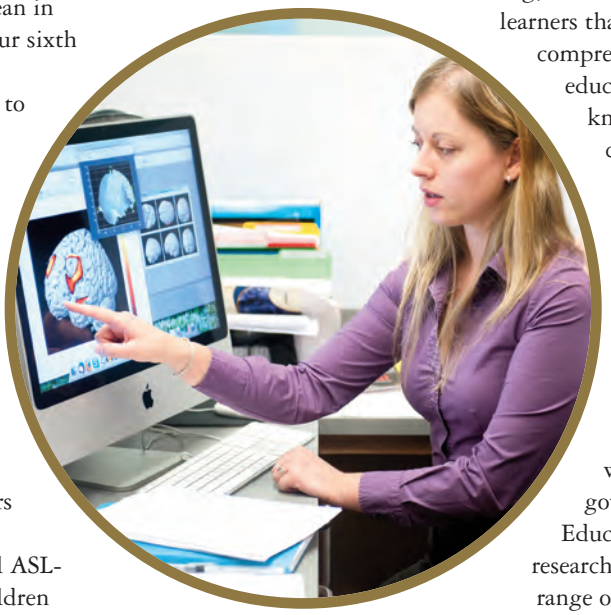
correspondences, such as is typical of the English language. Therefore, facilitating a visual learner's establishment and use of fingerspelling, sign-phonetic, and sign-syllabic organization appears to be an excellent means for promoting and successfully teaching reading to young visual learners.

At Our Doorstep, with More to Come! VL2's Translational Products and Communication Activities

One of the most exciting parts of conducting a research study is, frankly, when it is done. This is when we may discern the discoveries, disseminate the discovered information, and, most fun of all, translate what they mean in meaningful ways for society. Now in our sixth year, VL2 has reached our research and discovery stride. We now stand poised to move full speed ahead to embracing translation. Here, too, "good things come in threes."

Among the many translational products and communication activities to come:

- **LEARNING PRODUCTS.** Melissa Malzkuhn, VL2 community engagement coordinator, and team are pioneering ways to promote productive and successful lives and learning for visual learners through the creative design and production of Interactive Bilingual ASL-English iPad apps for teaching children how to read—a real first. All such translational apps will be the result of a solid foundation of basic VL2 research.
- **ASSESSMENT TOOLS.** Thomas Allen, VL2 co-principal investigator, and team have gathered five years of groundbreaking research findings and used them creatively to answer calls from the community for an ASL Assessment Toolkit that can be used to assess the language and literacy skills in young visual learners, both in English and in ASL. Accompanied by a comprehensive book that provides findings from years of research, statistical analyses, and invaluable data interpretation to support and explain the Assessment Toolkit, this is again a first in the field!
- **MULTI-MEDIA PARENT EDUCATION PACKAGE**. Kristen Harmon, leader of the Center's Integration of Research and Education strategic focus area, and team have built a stunning, first-time resource for parents of visual learners that is intended to be the first comprehensive and research-based parent educational product that provides knowledge about optimal communication pathways with young children. Drawing from a wealth of research (both her own and VL2), Harmon has produced a rich and multifaceted resource package for parents that presents state-of-the-art summaries of knowledge about sign and spoken language acquisition as well as community and governmental resources. The Parent Education Package also contains solid, research-based information on the rich range of educational and, crucially, communication choices that parents of a newborn deaf child and older deaf children have—providing the first truly comprehensive resource of its kind. This parent package will ultimately be available in multimedia formats, including print, DVD, and interactive iPad apps. In addition to direct distribution to parents where possible, it is planned for the parent package to be available through doctors' offices, hospitals, schools, the web, and other venues—essentially, the intent is for distribution methods to be most inclusive of parents with and without the availability of home technology.



Above: Petitto's graduate student analyzes language processing in the brains of bilinguals. **Below:** Laura-Ann Petitto with the state-of-the-art brain imaging equipment, called functional Near-Infrared Spectroscopy (fNIRS), in her BL2 Laboratory at Gallaudet University.

Vibrant Partnership VL2, the Clerc Center, and Greater Community Schools

Our relationship with Gallaudet University's Laurent Clerc National Deaf Education Center has been enriched this year through fruitful discussions and event planning, especially with Dr. Susan Jacoby, executive director of Planning, Development, and Dissemination. For example, on March 18, 2012, VL2

PHOTO BY SUSAN FLANIGAN

Above: Students Kaja Jasinska (left), Clifton Langdon (seated), and Millicent Musyoka (right) receive training from Dr. Petitto (middle) on the advanced neuroimaging system in the BL2 Laboratory at Gallaudet.

embarked on a new type of two-way communication involving VL2 participants, members of the Clerc Center, and educators from a variety of schools. At this event, VL2 members, Clerc Center members, and approximately 80 teachers from mid-Atlantic schools came together to exchange new research and teaching ideas and to carve out new research and teaching solutions in a mutual exchange.

Following VL2's commitment to two-way communication between researchers and teachers, the Center is also in the process of recruiting a P-12 school engagement coordinator, an individual who will be co-appointed at the Clerc Center. This vital individual will bridge activities and interests among VL2 researchers, the Clerc Center's priorities and goals, and schools, students, and parents.

More to Know... and More to Come!

There is, of course, much more to do, much more to know, and much more research to come from VL2, and our work is advancing at a thrilling pace. To learn more about the Center's resources—our vibrant Center lectures, Open Lab meetings, our new Cognitive Neuroscience seminar series, and a whole host of rich research discoveries, activities, and events that occur on a daily basis at our Center—check out our website and related links (*http://vl2.gallaudet.edu*). We also regularly make available our presentations with live web streaming and our VL2 newsletters, available through subscription at our website.

While VL2 began as a quiet revolution in a few small rooms on Gallaudet's main campus, the fruits of its endeavors are proving to be resounding. In the end, a true revolution comes with a revolution in thinking. It comes from the revolutionary knowledge that follows from a collective body of work.

This body of work is being collected and we now understand a lot. Old myths about the detrimental impact of early exposure to signed language came crashing down with VL2 findings. Early language exposure to a signed language, and especially early bilingual exposure to ASL and English, affords striking advantages in language, reading, and cognitive processing that facilitate reading in English. Moreover, old fears of "losing" a young deaf child if he or she is exposed too early in life to a signed language and/or language delay by exposing a child to two languages early in life are now widely understood to be scientifically unfounded. The only thing left to do is to take the actions that follow from this revolutionary knowledge and change educational policy and practice in ways that both fulfill the potential and celebrate the strengths of the visual learner.

Congressional Art Competition Features MSSD Student Work

Every year Congresswoman Eleanor Holmes Norton (D-DC) invites students from D.C. high schools to participate in the 30th National Congressional Art Competition to encourage and recognize the artistic talents of young Americans. In 2011, 16 students from the Model Secondary School for the Deaf (MSSD) participated, marking the first time that deaf students have entered the contest in its 30-year history. Of those students, three—Davante Kirk, Oliver Lee, and Diego Trejo—each received an honorable mention and had their work exhibited at the D.C. Chamber of Commerce. Ten other students exhibited their work at the Ronald Reagan Washington National Airport.

The students created the artwork in art and photography classes led by MSSD art and photography teacher Philip Bogdan. To encourage his students to develop their own original artwork concepts, he combines the technique of mind mapping with art history lessons. "The students begin their work from the mind map, and continue to refine their designs at increasingly sophisticated levels," said Bogdan. The students learn how to create a mind map, or a visual, non-linear diagram about themselves, to represent words, ideas, experiences, and interests. These maps serve as a starting place for organizing students' creative goals, which they match with exploring the work of an artist from their art history lectures from whom they found inspiration.

PHOTOS BY PHILIP BOGDAN

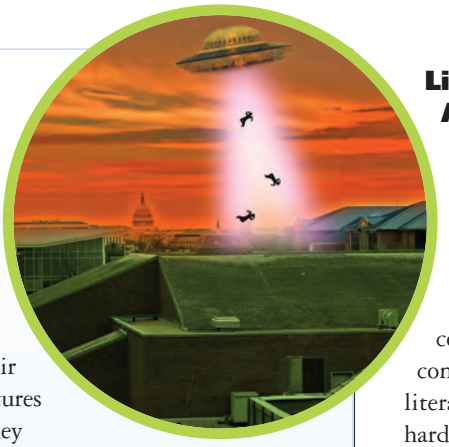
Above: MSSD junior Davante Kirk won an honorable mention for his multi-dimensional self-portrait.

Congresswoman Norton hosted an opening reception for participants at the Willard Hotel in Washington, D.C., on May 21, 2011. "With the display of tremendous talent at the art competition each year, you would think school districts across the nation are pouring money into art programs rather than taking it out," she said in a press release about the competition.

On June 9, the work of 10 of the MSSD students was among the 98 student entries exhibited at the Ronald Reagan Washington National Airport. All the top placing winners, including MSSD's Kirk, Lee, and Trejo, had a private two-person exhibit and reception at the D.C. Chamber of Commerce. Trejo's work was the last of the three to be exhibited; it was shown at the D.C. Chamber of Commerce from January 18-February 1, 2012.

The MSSD students whose work was exhibited at the Ronald Reagan Washington National Airport were: Mikail Baptiste, Shezhana Belousova-Kim, Katherine Fishbein, Mary Ann Gardner, Amberlin Hines, Joseph Mosely, Emmanuel Ramos Rodriguez, Kerie Scurri-Burns, Michael Stamper, and Belva Wolcott.

Read the full article online at *http://www.gallaudet.edu/clerc_center/congressional_art_competition_features_mssd_student_work.html.*



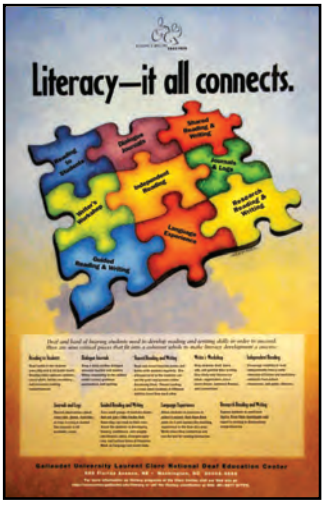
Top, right: Oliver Lee, a member of the MSSD Class of 2011 and now a Gallaudet University freshman, won an honorable mention in the 30th National Congressional Art Competition for his artwork entitled "UFO Invasion." Lee used parts of the U.S. Capitol dome to create his spaceship hovering above the Gallaudet campus.

Literacy—It All Connects

A FREE, ON-LINE COURSE

The Clerc Center has developed a free, self-paced, on-line course that provides an overview of the components of a comprehensive and balanced literacy program for deaf and hard of hearing students from preschool through high school.

This research-based training reflects effective teaching practices in schools around the country, and highlights a literacy program based on nine strategies for encouraging the development of reading and writing skills. The course features presentations in American Sign Language on each of the strategies as well as resources and suggestions for application in the classroom. To register for this e-learning course, visit *http://clerccenter.gallaudet.edu* and click on "Information and Resources" and then "Training & Technical Assistance."



ASL Content Standards, K-12 Update

In February 2012, the Clerc Center announced that it had validated the research synthesis developed by the ASL Standards Contract Team for the ASL Content Standards, K-12. The research synthesis consisted of a collection of current research on ASL development and acquisition from kindergarten to twelfth grade as well as the proposed framework of standards strands and benchmarks of what ASL skills students should learn by grades three, five, eight, and twelve. The ASL Standards Contract Team, which includes university researchers and deaf school leaders, has worked diligently to develop this research-supported document that will serve as the foundation for the next phase of the development process.

The Clerc Center wants to acknowledge the expert reviewers that provided input during the review stage of the research synthesis and proposed framework prior to validation. This group of esteemed reviewers was selected through an open nomination process that took place in the spring of 2011: Dr. Deborah Chen Pichler (Gallaudet University, Washington, D.C.), Dr. Kim Brown Kurz (Rochester Institute of Technology, Rochester, N.Y.), Dr. Marlon Kuntze (Boston University, Boston, Mass.; now at Gallaudet University), Dr. Poorna Kushalnagar (University of Rochester, Rochester, N.Y.; now at the Rochester Institute of Technology), Dr. Diane Lillo-Martin (University of Connecticut, Mansfield, Conn.), Dr. Richard Meier (University of Texas, Austin, Tex.), and Dr. Brenda Schick (University of Colorado at Boulder, Boulder, Colo.).

The ASL Standards Contract Team has begun the next phase of this work—drafting the K-12 ASL Content Standards and benchmarks. The Clerc Center anticipates receiving the first draft of the standards and benchmarks in June 2012, and will assemble a group of ASL instructors and specialists in July to provide feedback on the draft. A subsequent draft of the standards and benchmarks will be available for public comment in the fall of 2012. Look for more information on how to provide feedback during the public comment period at the start of the 2012-2013 school year. It is anticipated that the ASL Content Standards, K-12 will be finalized and ready for dissemination in 2013.

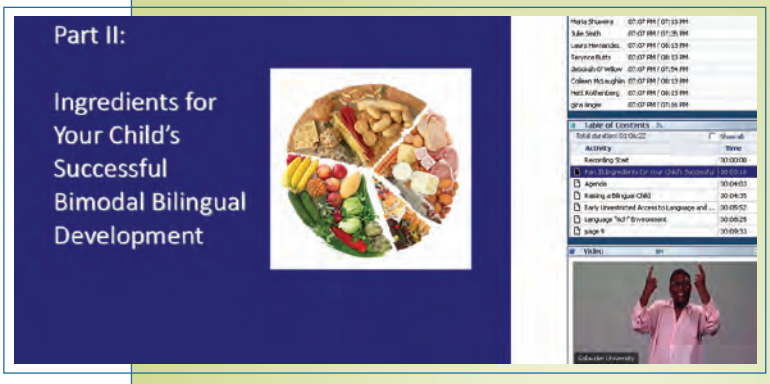
Please visit the ASL Content Standards, K-12 web page at *www.gallaudet.edu/Clerc_Center/Clerc_Center_Priorities/Clerc_Center_Strategic_Plan/ASL_Standards_Action_Plan.html* for future updates on this important work.

Clerc Center Resources for Your Toolbox

- **CLERC CENTER WEBSITE:** Turn to the Clerc Center's main website for information and resources, *http://clerccenter.gallaudet.edu*
- **INFO TO GO:** A centralized source of information related to deaf and hard of hearing children from birth through age 21, *http://clerccenter.gallaudet.edu/InfotoGo*
- **TRAINING & TECHNICAL ASSISTANCE:** Technical assistance and professional development workshops for families, educators, and professionals working with deaf and hard of hearing children, *www.gallaudet.edu/Clerc_Center/Information_and_Resources/Training_and_Technical_Assistance.html*
- **NATIONAL OUTREACH RESOURCES:** A network for outreach providers serving deaf and hard of hearing children. This on-line membership community is an interactive site for outreach providers for deaf and hard of hearing children birth through age 21 and their families, *http://grou.ps/norclerccenter*
- **PRODUCTS AND PUBLICATIONS:** Resources and products are available both online and in print from the Clerc Center, *www.gallaudet.edu/Clerc_Center/Information_and_Resources/Products_and_ Publications.html*
- **SHARED READING PROJECT:** Offers information about what the SRP is, how it works, what the research behind it is, and what we are learning, *www.gallaudet.edu/Clerc_Center/Information_and_Resources/Info_to_Go/Language_and_Literacy/Literacy_at_the_Clerc_Center/Welcome_to_Shared_Reading_Project.html*
- **COCHLEAR IMPLANT EDUCATION CENTER:** Offers information related to educating and supporting a child with a cochlear implant as well as related to cochlear implant technology, *www.gallaudet.edu/Clerc_Center/Information_and_Resources/Cochlear_Implant_Education_Center.html*

Clerc Center Webinars Bring Experts to Your Doorstep

The Clerc Center offers webinars that are a convenient way to participate in professional development as well as supply families with needed resources. Without incurring traveling expenses or workshop fees, individual educators, professionals, and parents can interact with professionals in the field of deaf education from the comfort and convenience of their own office, school location, or home computer. It's also possible for groups of colleagues, teachers, and/or families to view the webinars from one central location. All the webinars are presented in American Sign Language (ASL) with a spoken English voiceover and captions.



During the 2011-2012 academic year, the Clerc Center offered three webinars, all of which are archived for viewing on the Clerc Center website (*http://clerccenter.gallaudet.edu*).

- **Sharing Power**, by Robert Whitaker, PsyS, NCSP, ABSNP, broadcast on December 8, 2011, focused on practical solutions on how to communicate more effectively when in a power struggle with a deaf or hard of hearing student.
- **Everything You Always Wanted to Know About ASL/English Bimodal Bilingual Education**, by Susanne Scott, cochlear implant bilingual specialist at the Clerc Center, and Dr. Laurene Simms, professor of education at Gallaudet University, broadcast in two parts (January 12 and February 9, 2012), provided an overview of ASL and English bimodal bilingual early childhood education and the research supporting its positive impact on ASL and spoken language acquisition.
- **Sharing Autism Research on Deaf or Hard of Hearing Students**, by Dr. Christen Szymanski, director of research and evaluation at the Clerc Center, was broadcast on April 19, 2012. Szymanski discussed teaching strategies, considerations for language development, and how to manage an autistic child in the classroom. She is also the author of "Managing Behavior by Managing the Classroom: Making Learning Accessible for Deaf and Hard of Hearing Students with Autism Spectrum Disorders," published in this issue of *Odyssey*, and the lead author of "Deaf Children with Autism Spectrum Disorders" published in the March 2012 on-line issue of the *Journal of Autism and Developmental Disabilities*.

To view the archived webinars, visit *www.gallaudet.edu/Clerc_Center/Information_and_Resources/Training_and_Technical_Assistance/Distance_Education_at_the_Clerc_Center/Webinars.html.*

Clerc Center Launches On-line National Outreach Resources Network

The Clerc Center launched National Outreach Resources (NOR), a network for outreach providers serving deaf and hard of hearing children and their families, in the summer of 2011. Members may share strategies and resources, use discussion forums to ask colleagues for ideas and suggestions, and set up sub-groups to create networks around topic areas.

Membership has quickly grown to over 350, and more educators and professionals are registering every day. Visit NOR at *http://grou.ps/norclerccenter* for more information and to register.

Upcoming Conferences

May 30-June 1
2012 National Transition Conference: "College and Careers for Youth with Disabilities," Washington, D.C. To be held at the Washington Marriott Wardman Park. For more information: *www.transition2012.org*.

June 5-7
NHS 2012, "Beyond Newborn Hearing Screening: Infant and Childhood Hearing in Science and Clinical Practice," Cernobbio (Lake Como) Italy. To be held at the Villa Erba Congress Center. For more information: *http://nhs2012.org*.

June 18-20
Head Start's 11th National Research Conference, "Research on Young Children and Families: Effective Practices in an Age of Diversity and Change," Washington, D.C. To be held at the Grand Hyatt Washington. For more information: *www.acf.hhs.gov/programs/opre/hsrc/*.

June 21-23
Hands & Voices National Leadership Conference 2012, Hood River, Ore. Hosted by Hands & Voices of Oregon. For more information: *www.handsandvoices.org*.

June 21-24
116th Annual National PTA Convention and Exhibition, San Jose, Calif. For more information: *www.pta.org/2042.asp*.

June 28-July 2
AG Bell Biennial Convention, "Connect, Discover, Inspire," Scottsdale, Ariz. To be held at the Westin Kierland Resort. For more information: *www.agbell.org*.

July 3-7
51st Biennial National Association of the Deaf Conference, "Nothing About Us, Without Us!" Louisville, Ky. To be held at the Hyatt Regency Louisville and the Kentucky International Convention Center. For more information: *http://nad.org/louisville*.

October 5
Annual Fall Seminar: "Families Formed Through Adoption," Boston, Mass. Sponsored by Children's Hospital Boston. For more information: *http://childrenshospital.org/clinicalservices/Site2143/mainpageS2143P12.html*.

October 16-19
42nd Southeast Regional Institute on Deafness Conference, "All Aboard for Employment!," Chattanooga, Tenn. For more information: *www.serid.org*.

October 17-21
Conference of Interpreter Trainers 2012, Charlotte, N.C. To be held at the University Hilton. For more information: *www.cit-asl.org*.

October 25-26
33rd Annual Fall Conference on Mainstream Students with Hearing Loss, "Apps to FMs: Expanding Opportunities through Technology," Springfield, Mass. To be held at the Sheraton Hotel. For more information: *www.clarkeschools.org*.

November 8-10
6th National American Sign Language Roundtable, "Handiwork, Hone, Historify!" Olathe, Kan. To be held at the Kansas School for the Deaf. For more information: *www.jalc.edu/gurc/aslrt*.

November 15-17
2012 ASHA Convention, "Evidence of Excellence: Opportunities and Outcomes," Atlanta, Ga. To be held at the Georgia World Congress Center. For more information: *www.asha.org/events/convention*.

2013

February 14-16
Association of College Educators-Deaf and Hard of Hearing 2012 Conference, Santa Fe, N.M. For more information: *www.acedhh.org/conference.htm*.

May 29-June 1
2013 ADARA Conference, "Blazing New Trails," Minneapolis, Minn. To be held at the Hilton Minneapolis/Airport/Mall of America. For more information: *www.ascdeaf.com/blog/?p=963*.

June 26-29
Convention of American Instructors of the Deaf, Rochester, N.Y. To be held at the National Technical Institute for the Deaf. For more information: *www.caid.org*.

June 26-29
23rd Biennial American Society for Deaf Children Conference, Tucson, Ariz. To be held at the Arizona School for the Deaf and Blind. For more information: *www.deafchildren.org*.

should research guide practice?

By Claire Bugen

Claire Bugen is superintendent and chief executive officer of the Texas School for the Deaf in Austin, where she is responsible for the school's growing student population of over 500 in addition to the school's statewide outreach services. Before becoming superintendent, she served as middle school supervising teacher, director of the upper school, and assistant superintendent. Bugen also co-authored, with Richard Reed, the book, *The Process Approach to Teaching Language to Deaf Students.* She previously served as secretary and president of the Convention of American Instructors of the Deaf (CAID) and the Conference of Educational Administrators of Schools and Programs for the Deaf (CEASD). Bugen currently chairs the CEASD Accreditation of Schools Committee, serves as a member of CEASD's Government Relations Committee, and was appointed to the Gallaudet University Board of Trustees in 2009.

If each of us was asked, "Should research guide practice in deaf education?" chances are most individuals would give a resounding, "Yes." However, we have learned that the devil is in the details. All too often, we as deaf educators are skeptical about bodies of research in general education or special education on the grounds that it does not apply to our "unique" population of learners, or we protest that the research is too removed from the real world of our classrooms, or we simply shy away because we are intimidated by the notion of randomized experimental designs and correlational theory. I love this issue of *Odyssey* because it gives me hope that the gap between research and practice is narrowing as committed teachers and administrators continue to dedicate themselves to "what will work" for a particular deaf or hard of hearing student or a particular program.

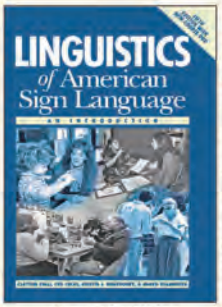
In an era of unprecedented educational accountability with increasing demands and decreasing resources, educators and administrators are seeking evidence-based instructional programs and strategies that will allow us to remove the current barriers to student learning and achievement and make a difference for our students and families. To do that, we must turn to research and the application of research to practice at the school, program, and classroom level.

In my 33 years as a supervisor of teachers, I have seen time and time again how research-based practices make a difference in the classroom for all students. Some of our most promising initiatives result from translating research outcomes into relevant practice. The authors in this issue give testament to that in their application of evidence-based practices that reflect research in bimodal bilingual education, strategic teaching, learning theory, visual language and visual learning, curriculum mapping, and progress monitoring as well as applications of research outcomes to special populations. There is no greater joy than watching talented teachers adopting and adapting strategies gleaned from the general, special, and deaf education literature and crafting them into strategic instruction that has purposeful routines and coordinated, engaging activities designed to raise student achievement and prepare students to excel in school and life.

In closing, let us remember that innovative thinking is spawned by research as well as practice, and evidence of what works comes in different forms—from rigorous experimental research with wide application to teachers learning through action research to improve instruction in their own classrooms. Innovative ideas can become promising practices, and scientific research lends support to those practices that are most effective for improving student learning. Just as we need teachers and administrators to recognize the value of research and evidence-based practices as cornerstones in improving the education of all students, we need researchers who are willing to translate their scientific study into useful classroom practice.

As a member of the Gallaudet University Board of Trustees, I recognize the value this issue of *Odyssey* has for educators in all educational environments working with deaf and hard of hearing children. It fosters the sharing of information and resources among professionals, and I thank the Clerc Center for creating a publication through which we can learn from each other. I hope it will be a catalyst to bring varying perspectives together in dialogue about what educators and families are seeing every day in homes and classrooms, and how what together we are discovering can better the education of deaf and hard of hearing students.

Explore Different Facets of Linguistics, Deaf Culture, and Cochlear Implants



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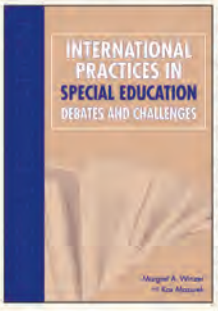

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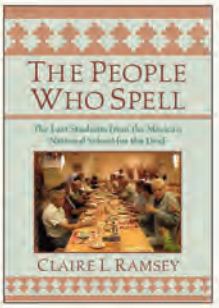

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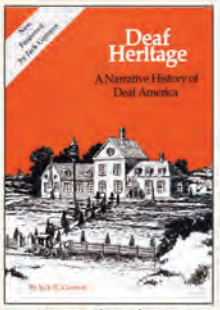

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