

Words Upon a Window Pane: Opening Doors for the Deaf College Student

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Karen Hopkins:

Good morning. I have the honor this morning to introduce our plenary speakers, Dr. Harry Lang and Dr. Bonnie Meath-Lang. I have known both of them for many years. They are exemplary professors at NTID, the National Technical Institute for the Deaf, and Harry is an educator ever-promoting science. You will see his name as 'outstanding this' and 'outstanding that,' and most often connected to promoting science, particularly among persons who are Deaf and hard-of-hearing. He is quite a prolific author, and I believe his third book is coming to print this week, or maybe it has happened today. He will probably tell you a little bit about that and where to find it.

Bonnie is an exemplary educator as well. She is an artistic director, a performer, and a playwright. What they are going to share with us today is what research has shown about teaching and learning among students who are Deaf and hard-of-hearing, and they will add an historical flavor to that based upon a book that they published together as well as other research they have conducted. They will also be talking about learning styles, the impact of technology, and a number of things that you'll be able to carry back to your home environment that will, in the end, have an impact on teaching and learning in your settings across the United States. At this time, I would like to turn it over to Bonnie and Harry, who will be sharing with you their perspectives. And then we hope to have about fifteen minutes at the end for questions and answers.

Harry Lang:

Good morning. First, before I forget, I want to thank all of the people who invited us and are supporting us for this presentation, including the interpreters and the captionist. About one hour before I left Rochester two days ago, I received some sad news that I want to share with you. A good friend of ours and a good friend of all of yours, Bill Stokoe, passed away on Tuesday evening. I received some e-mail from a friend at Gallaudet University about Bill's death, and I wanted to share this with you. I'd like to ask you to take a moment of silence in honor of Bill. He committed his life to American Sign Language research.

Thank you. Let me explain a little more about myself. I became deaf at the age of 15 in Pittsburgh, Pennsylvania, and I attended the Western Pennsylvania School for the Deaf (WPSD), a residential school located there. Aaron Gorelick is voice interpreting for me today, and I have asked him to add a Pittsburgh accent.

As Karen said, we plan to talk about teaching research. I have taught at NTID in Rochester, New York, for 30 years in physics, mathematics, and a methods course for preservice teacher education in NTID's Master of Science in Secondary Education program. When I graduated from WPSD in 1965, I looked around for colleges. I was accepted to Gallaudet College, but I wanted to major in Physics and Gallaudet didn't have a comprehensive Physics program at that time. So I searched around for other places, and found a small college near Pittsburgh called Bethany College in

West Virginia. Six classmates from WPSD attended Bethany with me.

At that time in the United States, there were no more than 500 Deaf and hard-of-hearing students in college, including Gallaudet. I was majoring in Physics, with no interpreters for four years—no notetakers, no captionists, no telephone, no TTY. I received my bachelor's degree in Physics with no support. Please think of this presentation as a standing ovation to those of you who provide support services.

Bonnie, would you say a few things about yourself and your background?

Bonnie Meath Lang:

Like Harry, I started at NTID as a very young professor, and as a woman teaching in a college environment, I had very few models. In that way I connected very much to the experience of my students, and I became very interested in the idea that perhaps I could effect change by finding stories, telling stories, and acting out stories. And so as a teacher, first of English then later of drama, there was a hidden agenda in my work: To find the stories that speak to people like myself, who wanted to identify people in history and in contemporary life whose lives point to the way we can and should live our lives. People like Bill Stokoe, who had the vision and the courage to pursue an area of research that was unpopular at the time. People who had the courage to stand up for themselves, to create art and theater under nontraditional circumstances. Those kinds of stories have motivated both of us, and we have cherished them as we pursue the demands that come with educating our students.

Harry Lang:

My own research focuses on the teaching/learning process. I'd like to share a few of those studies today.

When I began the "Teaching Research Program" at NTID, we asked 100 college teachers to identify the most important priorities for research. The top priorities they identified were communication issues in teaching, learning styles and teaching styles, and the characteristics of effective teachers. Today we will summarize five different studies that we chose from a host of studies that have strong implications for your work in providing support services to deaf students.

Bonnie Meath Lang:

At the same time, these areas of research are very much connected to life history work. Throughout history, deaf people have found their own ways to succeed as students pursuing an education. And some of those strategies have been both self advocating and affirming, we believe, to the work that you are all engaged in.

Harry Lang:

Back in 1984, I was invited to interview Dr. Stephen Hawking. At that time, I was a physics teacher and it was an honor to interview him. I was the president of an organization of scientists with disabilities, and during the interview I had an ASL interpreter. Dr. Hawking had a graduate student he brought with him. Hawking has Lou Gehrig's disease, amyotrophic lateral sclerosis, and his speech was unintelligible. He would speak and his assistant would repeat his words, and then the ASL interpreter would interpret for me. In the middle of the interview he looked up and he said, "Dr. Lang, it must be difficult to be deaf." I was taken aback when he said that. I love tennis, and my idea of being "handicapped" is someone with a mobility challenge like him. On the other hand, he saw the issue of communication and deafness as a "handicap." When I arrived home in Rochester, I thought about his perception and the attitudes people have about disabilities.

That started me on a quest for life stories related to people's attitudes. I believe attitudinal barriers often impede the progress of deaf people, and I want to point out how that relates to our work.

I soon began what I call "NIH Research." No—that does not stand for National Institutes for Health. It is an abbreviation I use for "Needle in the Haystack" Research. I began searching through histories of biology, chemistry, speedreading, etc., and looking for the term "deaf." Bonnie and I began working in both the arts and sciences around 1988. During vacations, we traveled to Italy, France, Germany, Scotland, Ireland, Canada, and other countries, searching through libraries, reading through books, and looking for such words as "dov" in Swedish, "gehorlos" in German, and other terms for deafness. One by one, we found more than 1,000 deaf women and men in science, math, engineering, and medicine. We stopped counting after about 1995. We focused

on what these deaf people contributed to science, arts, and humanities.

We found Nobel laureates. There are eight craters on the moon named in honor of deaf people. We found that each of those 1,000 deaf people had experiences relating to the attitudinal barriers they faced, and the struggles in their lives. Two-thirds of those 1,000 scientists were either born deaf or became deaf before the age of 5.

A book I published called *Silence of the Spheres: The Deaf Experience in the History of Science*, described the barriers deaf people faced and their contributions in fields of science. The book Bonnie and I wrote together, *Deaf Persons in the Arts and Sciences: A Biographical Dictionary*, included 150 life stories. And as Karen mentioned, there is a third book coming out this month, *A Phone of Our Own: The Deaf Insurrection Against Ma Bell*. All of these books describe the life experience of deaf people. We would like to connect a few of these stories to the information we share with you today.

Bonnie Meath Lang:

Deaf people's lives are also a very powerful inspiration for works of art. We have found at NTID that our students have been inspired by learning about the lives of deaf people through art. Two performances that we recently produced included a play I wrote called *A Sailor's Daughter* based on the life of the deaf French feminist playwright, Marie Leneru, who lived in the late 19th century. She died during World War I. Leneru created a powerful individual voice that is still very much a part of French literature. Very few people know about her; fewer people know that she was deaf. She also wrote a moving diary about her inner and outer life as a deaf person and her feelings that those lives, like many of ours, are often in conflict.

Two years ago, we lost a cherished colleague named Michael Thomas, who died at the age of 46, and was a very close friend of Harry and mine and a close friend to our program, as well as an inspiring teacher and institutor of the RIT Dance Company. We wrote and developed a multimedia dance and theater presentation based on the themes of his life as a deaf artist/choreographer, called *The Spirit and the Man*.

These were two works of love that I think demonstrate not only to us but to deaf students that these lives and this work can be creatively inspi-

rationally and artistically successful. The impact of these histories is repeated every day with the young deaf people we see and that Harry sees in visiting school programs. We have received hundreds of letters from deaf students talking about how important it is for them to know that there are other deaf people who have strived, who have pursued an education under difficult circumstances, and who have fought for access. And that is, we think, a very fundamental part of our students' education.

There is impact, too, on their teachers and on parents who have also written us. We have presented some of this work at conferences for parents of deaf children, who are unaware of the lives of famous deaf people. Certainly, these stories can carry to the gatekeepers, to the college administrators and to the people making decisions about the educational lives of our students. In the long run, we hope such stories carry to government officials, because these lives validate what we are finding about the potential for success and the characteristics of success for deaf people.

One of our favorite stories is the quotation that you saw when you were coming in to this presentation space, "Perseverantia omnia vincit," which was a quotation by Gideon Moore, a deaf chemist whose work really began to skyrocket after his graduation from the University of Heidelberg in Germany in 1869. Before Heidelberg, he went to Yale College, and when he left Yale this was found etched on the window of his dormitory room. We can look to this quote with interest—not only because it's an early example of dormitory vandalism—but also for the message that is communicated. Certainly this young man who went to Yale college and his deaf brother, H. Humphrey Moore, who is another story later on, experienced much that required perseverance. And that perseverance led later to Gideon's studying with Robert Wilhelm Bunsen, the famous German chemist, and to becoming one of the foremost chemists in the United States.

Harry Lang:

Bonnie mentioned that we received a stack of letters. Here is one quote from a deaf college student that shows the impact of such life stories: "I am now more aware of how we, deaf, have to work twice as hard to get where we want to be, to get what we need, to get support and equal rights. By doing this, we will make it easier for our next gen-

erations to have more equal access to life as did the past generations made it easier for us today.”

With this prefatory note about the impact of life histories on motivation and self esteem, I would like to summarize our first research study relating to learning styles. In this investigation there were six styles in every learner’s “profile.” The measure we used shows how *collaborative* or *competitive* one is—also how *dependent*, *independent*, *participative*, or *avoidant*. The first finding in this study was that deaf students are highly “dependent.” The term “dependent” in this measure is really not a negative concept. It means that these are students who need structure and organization and clarity. A teacher who is very organized and structured really helps such students learn better. We also found that deaf students were lower in the competitive style than expected, and that has direct implications for us. For example, some college professors, such as those in business programs, may encourage competitive behaviors. Students who are not strong in this style will be more challenged in such courses.

Issues also emerge related to empowerment and self advocacy. In our jobs, we are often involved in putting out fires. Developing a sense of self advocacy in deaf students is important. The students need to realize what’s happening in society among deaf people so they can advocate for themselves more and more.

Of those six styles, the one that shows a statistically significant correlation with achievement as measured by course grades is the participative style. Let us connect this to a real life story. At the age of about 11, Konstantin Tsiolkovsky became deaf. His mother gave him a kite. Connecting a small bucket to the kite string, he sent a cockroach into the high altitudes of his kite, and he dreamed of sending human people into space. It was in the 19th century when he first built a rocket and for years struggled for recognition by the Czarist regime. Many years later, in 1957, Sputnik was set into space, honoring this deaf man on the 100th anniversary of his birth. He is now known as the “Father of Rocketry.” His participation in a science experiment as a child led him to great breakthroughs.

Bonnie Meath Lang:

A more contemporary example is the deaf percussionist, Evelyn Glennie. She is very active in deaf organizations in England and around the UK. She is one of the world’s only solo percussionists

at this time, and has had many musical compositions written expressly for her. She is an excellent example of a person self advocating and *participating* in her own education. As her progressive hearing loss continued through her elementary school education, she pursued alternatives in studying music. She also pursued financial support for her art by writing to patrons until she was sponsored by a group called the Beethoven Society to study at the Royal Academy of Music. She was always experimenting, directly participating in determining how she could feel and read the music, how she could follow conductors, etc.

In addition to participating and creating one’s own success, one thing that Harry and I learned through the life stories was the importance of *networking*. To reinforce what he said about the great work you’re doing with PEPNet, your own manner of organization is a model. It was also very exciting to see some students involved with sessions this year and at past conferences, because they are learning through this conference experience to network.

There is a great deal of support in history for this kind of work. For example, we discovered a group of deaf women who set up a professional network and became master translators and cultural researchers at the Hispanic Society in New York City from the early 1920s through the 1950s. They, in turn, supported internships for other students to go there, to learn languages, and to research cultures.

There was also a group of deaf actors in the silent films, as you know from John Schuchman’s book *Hollywood Speaks*. These were some of the pioneers of the film industry. They networked with what was called the Bohemian Club, a group of very avant-garde writers, artists, actors, and poets. People like Ernest Hemingway were members of this Club, as well as actors like Charlie Chaplin. There was a whole deaf contingent who joined that club from the California deaf actors of the 1910s and 1920s. There is strong support in history for helping students find their organizations and find their networks of like-minded people.

Harry Lang:

In addition to encouraging participative learning styles, we also have research that supports *active learning*. That is important for both future employment and academic success. There is a saying that summarizes all of this very well: “Tell me, and I’ll forget. Show me, and I’ll remember.

Involve me, and I will understand.” I emphasize this in many teacher education workshops. It is critical for all of us to remember.

In a second research study, we examined characteristics of effective teachers using what we call a “structured response method.” We listed 32 characteristics that teachers generated in interviews. We distributed those to deaf college students and their professors and asked them to rank and rate the characteristics. The most important characteristic, from the perspective of deaf college students, was knowledge of course material. That top characteristic is exactly the same one identified in many studies with hearing college students.

On the college level, it’s not that serious a concern, but at a K-12 level, it is. In science and math education, about 80 percent of the teachers teaching deaf students have no degree in the content area. So that is an issue for teacher preparation, and it is an issue of establishing partnerships that we professionals in postsecondary education should consider.

Bonnie Meath Lang:

Again, the value of this characteristic is validated in life histories. One of the most interesting persons we researched was really the first woman anthropologist in the United States who gained notoriety, Ruth Benedict. Maybe some of you have read her book, *The Chrysanthemum and the Sword*, which was based on her studies of Japanese culture. She was a student of Franz Boas, a foremost anthropologist in the United States in the early 1900s and the person who set the stage for seminal cultural investigations. She was experiencing a great deal of frustration as a student, but Boas’ own work, which drew from different fields and different methods of inquiry, encouraged her as a deaf person to try and research more intently the visual aspects of culture. At that time, the prevailing methodology in anthropology was the transcription of oral languages and folklore, and later on, the taping of oral language. Benedict studied dance, costumes, pottery, and other visual aspects of culture. In doing so, she later became the person who was the authority in that field, and the teacher of Margaret Mead. A deaf person teaching at Columbia University, she had enormous influence in her discipline. In part, this certainly was the result of having had a teacher with the authority and knowledge of the discipline to be able to experiment and broaden his field—and encourage his students to do the same.

Harry Lang:

We found as we studied characteristics of effective teaching very similar patterns in the observations of deaf and hearing college students. There were two characteristics that were uniquely of concern to deaf students. One was that deaf students preferred more direct communication with their professors. And, secondly, deaf students want professors who understand deafness and deaf people.

Bonnie Meath Lang:

One of the silent film actors that we researched, and later a great artist and photographer, Theophilus D’Estrella, from California, worked with the Sierra Club at the time of its founding to document the environmental concerns of that club. His artistic talent became apparent to his teachers, and one sent him to Virgil Williams, one of the top artists in San Francisco at the time. Williams had no experience with deaf people, and decided that he would write notes with Theophilus D’Estrella. This communication later became a book, “Notes to a Deaf Mute Pupil,” which is still read by people in arts education and teacher education as a very important document on how to help students access their creative sources. It is also an early example of direct communication by a totally inexperienced teacher.

Harry Lang:

There are professors in the early history of deaf people in higher education who learned sign language. Perhaps you have had that experience of colleagues who voluntarily studied ASL and Deaf Culture at your colleges. We drew upon life histories from many years ago to show that it is really not a new issue with our students. Many people have experienced barriers in the past and have found wonderfully innovative solutions in their relationships to overcome those barriers.

Also important was the fact that of the teaching characteristics we examined, there was a statistically significant difference between the teachers’ perceptions and students’ perceptions for half of those, 16 of the 32. Therefore, we cannot assume that the deaf students know why we, as teachers, emphasize certain things. The students do have different perceptions, and sometimes that can hinder their progress. One good example is in relation to encouraging active learning. Deaf students had a statistically significant *lower* mean rating of that characteristic relative to teachers—

meaning that the students themselves do not see the value of their active participation in learning activities. Yet as we have mentioned earlier, the more participative a student is, the better the course grades.

Another study of the characteristics of effective teaching used an “unstructured response” method. That means we did not have a pre-selected list of characteristics that people looked at, ranked, and analyzed. Rather, we interviewed 58 deaf college students and collected 839 “critical incidents.” We asked them to reflect on their experience in college and think about something that happened in class that motivated them to learn from that teacher or situations that happened in class that were de-motivating. We collected 839 incidents, and we asked three college professors to categorize them. Direct communication with the teacher, once again, emerged as very important. That issue came up in 10 percent of the incidents.

In this study, there were 33 characteristics in all. We found that “teacher affect” variables were important as students reflected on effective teaching. Examples of affect included the teacher being caring and establishing rapport.

Bonnie Meath Lang:

This is also one of the ways we believe that students become aware of their own “generativity.” You may remember what that student said in the beginning of our presentation—that he knew now that he had to work harder. Why? Because if he did that and succeeded, it would make it easier for *future* groups of students. That is one of the most powerful messages we can transmit to our students.

One of our favorite examples is our friend Robert Panara, who is the founder of NTID’s theater and English department. Bob always looks back with fondness at another great deaf teacher, Frederick Hughes, who instilled in him his interest in drama. Bob, of course, came to NTID after his time at Gallaudet. He had great influence on the group of actors who established the National Theatre of the Deaf, people like Bernard Bragg, Patrick Graybill, our colleague, and Phyllis Frelich. His influence continues. That influence of a powerful mentor and the sense of generation is very strong and something we need to nurture as teachers.

Harry Lang:

I remember when I was a deaf college student majoring in Physics, I considered myself somewhat fortunate. Although I didn’t have interpreters, it happened that the chair of my physics department had come from China, and he struggled to communicate in English. He wrote on the blackboard so much that the entire class benefited from that. But for me, there was a special bonding. And I think for deaf college students who are mainstreamed in hearing colleges that bonding is so important, as it was important to me. Having a teacher who struggled with communication issues himself really helped that happen. That bonding could be critical to retention of our students in college.

Bonnie Meath Lang:

In addition, we found in this research that our students value *diversity*. Perhaps one of the most important things we can do in the service of fostering diversity and diversity education and demonstrating the respect for diversity that we hope students will take with them into their lives is connecting them with some of the many powerful deaf people who belonged to the Deaf community, but also to other cultures and other communities as well. A few of them include John Lewis Clark, artist, sculptor, Native American; Glenn Anderson, deaf African-American educational advocate and first rehabilitation education chair from Michigan; and our director at NTID, Robert Davila, who is the son of a Mexican migrant family in California, who later became the highest ranking deaf officer in the United States government.

Harry Lang:

Another research study we conducted at NTID related to communication in the classroom. It also related to the use of technology. The study involved 144 deaf students and focused on reading in science. There were three different abilities of reading, as measured by the California test. One group of deaf college students studied text only. Another group studied text and content movies. A third group studied text and sign movies. A fourth group studied text and adjunct questions. The fifth group received all of these stimuli.

It is interesting that we found that deaf students with low reading abilities who were asked

the adjunct questions as they read, performed on a test of immediate factual recall equally well as students with high reading ability who had text only. What made that possible was the interactive element. As they read, they had to think about what they were reading. The adjunct questions apparently encouraged this cognitive activation.

We plan to do more research in that area. Right now we know that for a science lesson as we used in this study, it is really important to have mental engagement as part of the reading process. In this study, the sign movies and the content movies were passive activities. The students would just watch them and not think about them. They had to interact more with the adjunct questions.

Signs could be helpful. We saw some improvement, but it wasn't statistically significant. And we saw some improvement with the content movies, but that also was not statistically significant. These adjunct aids with instructional prose may make a difference in learning under other conditions, such as more technical content. Only additional research will help us understand the roles of various multimedia adjunct instructional aids.

Now, imagine that before I began talking about effective teaching if I had asked every one of you to take one minute and write down which characteristic, from your perspective, was the most important. The traditional way to teach is to ask a question and identify one student to give a response. By having everyone of you take a minute to think about my question, we have mental engagement. In the mainstream classroom, we have interpreters or real-time captioning. But what we also need to optimize learning is to develop more effective teaching strategies that directly involve students, whether or not we have support services and high-technology assistance.

We cannot assume that "technological advances" are automatically good for people. Historically that has not always been true. If you look at the telephone, deaf and hearing people had equal access to long distance communication before the development of the telephone. And after the invention of the telephone, it took 90 years for deaf people to catch up with the mainstream. Movies with sound tracks also had a negative impact. In the 1920s, deaf people loved to go to silent movies. Then after the "talkies" arrived, it took 40 years before deaf people had access through captioning again. In regard to the development of computer

technologies, I think we need to conduct research to make sure that deaf people don't end up lagging behind with that technology as well.

What are the implications for you? We have been talking about direct communication between teachers and students. We currently provide different media for access to communication—interpreters, CART, C-Print, speech to print, notetaking. But the ideal situation, as research is showing, is direct communication between teachers and students, active involvement of the students, and interactive processes, especially dialogue. So there are some critical research questions we need to address over the next few years. How do we optimize these elements for learning in the classroom?

Bonnie Meath Lang:

In fact, what does *all* of this mean? I think if Harry and I want you to take anything from this presentation, it would be three areas of emphasis.

First, we need to conduct research continually to support our efforts. In that research process and in the associated processes, we need to involve deaf people. All of these research studies, and all of this life history work, have involved deaf people and their own creations and their own making sense of the world.

Secondly, we need to find ways to network and to pass on the stories and the research results to students and professionals in K-12 and even earlier environments. In this regard, Harry is still advocating the metric system when he says, "A gram of prevention is worth a kilogram of cure" (He won't give up that battle yet). We need partnerships between postsecondary programs and K-12 programs. We need to get our work out and to invite young students into the college setting to see how college people work together, and to see how young people in college create art, create their futures, and research for themselves the questions that they need answered to make sense of their lives.

And finally, the life stories, the awareness of the accomplishments of other deaf people and the ability to connect deaf people with each other and with powerful deaf and hearing mentors is a way to foster potential. We believe this honors the lives of deaf people as we create better lives for deaf and hearing people working together in education—the exploration of human knowledge and in the exploration of what is important in life.

Thank you.

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