

# Camp Invention ASL: Inclusive, Relevant, Family-Focused Science

*By Joseph Santini*

When I was teaching in a New York high school, I asked one of my students why he did not like to read. The student, who was bright but struggling, told me he felt no connection to the books available to him at school. In fact, he said, he had looked through every book in our classroom and every book in the library only to confirm his own sentiment: Not one of the books concerned a character who was deaf, black, and male—like him. At a heartbreakingly young age, my student had internalized that reading was not for him.

Among the fields that particularly lack images of diverse participants are those of science, technology, engineering, and math, fields captured under the acronym STEM. Often in STEM fields, images and experiences of deaf and hard of hearing children, children of color, and young women are rare or absent altogether, with the result that these children do not visualize themselves as becoming scientists. Like my student from that New York high school, they make an unconscious judgment that science is not for them. The lack of representation in these materials creates a self-fulfilling prophecy that leads students to ongoing struggles with STEM curriculum and a lack of confidence, a process that has been explored by the National Research Council (2011).

Research has shown that students benefit from seeing positive images of people like themselves doing science (Hurtado, Alvarez, Guillermo-Wann, Cuellar, & Arellano, 1998). Therefore, in the summer of 2013, when Jill Bradbury approached me about the possibility of establishing a summer program in STEM and American Sign Language (ASL), I was excited. The program would be a section of Camp Invention, a national organization that partners with over 1,000 schools throughout the United States to provide summer experiences in STEM fields for children entering grades one through six. Bradbury, a professor of English at Gallaudet University and a mother of two young hearing children, wanted to establish the first Camp Invention in ASL. In this camp, deaf and hard of hearing children, their hearing siblings, and hearing children of deaf parents could engage in the fun of learning science together. We would call it “Camp Invention ASL.”

*Photos courtesy of Joseph Santini*

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**Right, top:** Camp director Joseph Santini (in green) welcomes campers to Camp Invention ASL.

**Right, bottom:** Students participate in an array of hands-on STEM activities.



As we developed the camp, we addressed several challenges. We wanted to:

- make a positive STEM environment for all, where each camper could feel like a scientist;
- incorporate both ASL and English in a science curriculum;
- involve the children's families so that learning would be meaningful and continue at home; and
- modify a curriculum to suit a community for which it wasn't designed.

### Feeling the Science A STEM-Positive Environment

Having accepted for the first time the role of camp director, I was very aware of these issues when I stood up to welcome our campers and their families in 2016. I tried to frame our opening message to share that science, ASL, and deaf and hard of hearing people go hand in hand.

As the camp got underway, I encouraged teachers to share the same message—that deaf and hard of hearing individuals use ASL to be successful in STEM positions throughout the country. Our young campers got to meet and work with some of these scientists—deaf adults who innovate, lead their fields, and showed up to role model for the deaf, hard of

hearing, and signing hearing children whom they knew needed them. Last summer, for example, Todd Epps and Alex Camarota, deaf employees of the U.S. Patent and Trademark Office, the national sponsor of Camp Invention, spent a day with our campers.

### Incorporating ASL Overcoming—and Tearing Down— Language Barriers

Language deprivation is one of the major challenges facing the Deaf community. Many deaf people are born into families that do not use ASL and lack full access to language during their first years of life, a crucial developmental period. These students struggle with both English and ASL, sometimes throughout their lives. For teachers, this makes scaffolding language throughout the curriculum a necessity.

Camp Invention ASL modifies the curriculum provided by the national organization to incorporate ASL and Deaf culture. We provide announcements in ASL with English captions. We provide vocabulary and concepts in ASL and in English, and, just as important, we demonstrate for our campers how STEM vocabulary is properly used in ASL. For our weeklong experience, the goal is to make STEM and ASL a part of family life.

## Whole Child Means Whole Family Involving Parents and Siblings

The National Education Association published a policy brief (Van Roekel, 2008) stating that one factor consistently led to high student achievement: the involvement of the student's family. It wasn't the school or the student's age, gender, or race. When families were involved, students demonstrated increased achievement.

Students need to know parents support their learning. They need to have opportunities to reflect on their learning when they are at home, with the people who are closest to them. If students leave school without the freedom or the skills to share what they have learned, less of it is likely to be retained or further analyzed.

One of our goals at Camp Invention ASL is to allow deaf and hard of hearing children, their hearing siblings, and hearing children with deaf parents to learn and have fun together in a STEM-focused environment. This means Camp Invention ASL serves everyone with deaf and/or hard of hearing individuals in their families. When deaf and hard of hearing children and their siblings learn science together, learning continues in the family. It isn't lost on the bus on the way home.

Amber Marchut, a professor at Lamar University in Texas who is earning her doctorate in Gallaudet's Education Department, researched the question of why some deaf people succeed in STEM while others do not (Marchut, 2017). Marchut noted that many of the deaf scientists she interviewed for her doctoral study cited the critical roles of their parents in contributing to their success. She added:

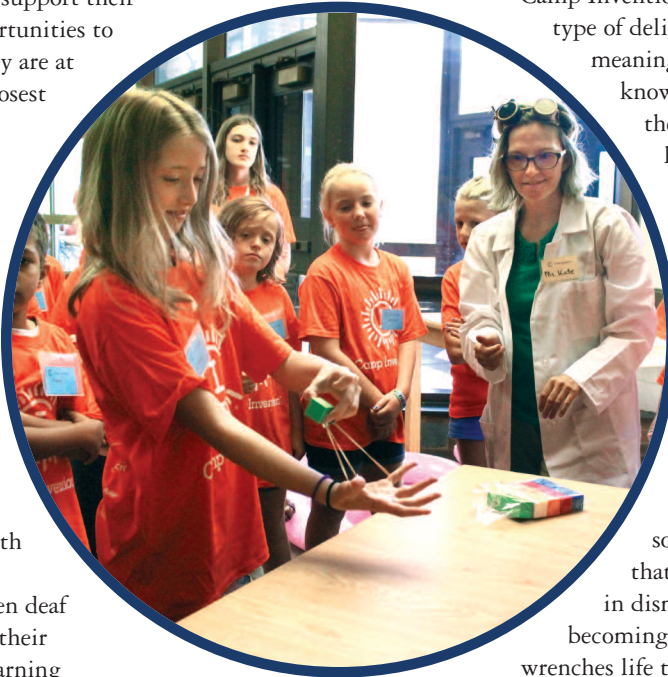
*One [deaf scientist] mentioned her mom taking her to a crime lab when she was young due to her interest in forensics; another mentioned how his parents asked him why he wanted to change his goals from dentist to physician assistant, and they encouraged him to stay with his original goal of becoming a dentist. Another's mom would provide babysitting services so she could go to classes or study, and another mentioned not wanting to go to college—but his mom kept at him. (Marchut, personal communication, December 2016)*

Our camp had strong support from parents. They acted as instructors and classroom volunteers, even as camp artists. Our showcase at the end of the week allowed parents to celebrate their children and their work. We had hearing parents come up

to us with tears in their eyes as they took in the achievements of their children. Some of these parents had previously experienced limited involvement with their children due to language challenges. The showcase, spotlighting their children and their achievements, gave parents an opportunity to see their development and understand their potential. When parents saw the work of older campers, they understood what the future could mean for their own children.

Camp Invention ASL is a lot of work, but that type of delight makes it extremely meaningful for all of us—as does knowing that learning continues in the home. Darleen Hutchins, one of last year's instructors who is the mother of a deaf 9-year-old daughter, texted me a week

**Left:** Campers studying propulsion invent handmade tools with which to knock down blocks.



after camp. She wanted to let me know that her daughter was dismantling an old washing machine, intending to build something new out of it. We agreed that a young girl who feels confident in dismantling washing machines is becoming prepared to handle whatever wrenches life throws at her!

That's the power of Camp Invention. It's not only about normalizing the access of deaf and hard of hearing students to STEM; it's also about normalizing the access to STEM in families with deaf and hard of hearing members.

## Adapting a Curriculum Science Works Through Seeing

A third challenge we faced was adapting a national curriculum to reflect the needs of children in the Deaf community. This didn't mean simply taking the curriculum approved by the national office of Camp Invention and addressing issues of ASL and English—although language is certainly a priority for a bilingual camp. It also meant ensuring the content stayed high level and including activities that provided the best learning experience for all children.

Part of the adaptation concerned the issue of deaf, hard of hearing, and hearing interaction, which we addressed before the camp opened. We wanted to train our counselors to identify how to respond to challenges that might arise due to communication. We practiced ways to remind our hearing campers to use ASL and to include everyone in every conversation. We discussed the challenges hearing children face in experiencing a learning environment that is primarily visual



for the first time and how to reinforce visual discourse skills. We practiced working with deaf and hard of hearing campers on positive ways to assert themselves. We wanted to make sure we were giving students a positive social experience as well as concrete subject content.

We also spent months supporting our teachers as they identified possible adaptations in the curriculum, such sections in which inquiry was based on hearing and sound. At first these kinds of activities seemed to present problems, but by working together we found solutions. For example, one unit invited everyone to sing like a cricket. We found students could rub their legs together like crickets instead of sing, and they could also use tiny combs to make vibrations. We were able to avoid the emphasis on hearing while keeping the thinking high level. We could also incorporate ASL classifiers. Instead of simply signing or fingerspelling *vibrate*, for example, we could use a classifier to not only represent the concept “vibrate” but to show what vibrated and how.

Adaptations require time and resources—and we did our best to provide these, working with our teachers to analyze and adapt the curriculum and make it relevant to our campers and their families.

### Looking Back, Looking Forward A Success Continues

In three years, we have come a long way. We have adapted material to make it relevant, created a STEM-positive environment that celebrates diversity, brought families together, and lived the close link between ASL and achievement.

The number of campers has nearly doubled, and the camp is no longer unique. While our camp is held at the Model Secondary School for the Deaf in Washington, D.C., a sister camp, led by Kamilla Jakubowyc, a science teacher who worked with us on the first Camp Invention ASL, has opened at the Maryland School for the Deaf in Frederick. We have had positive press; our camp was featured on a local news channel and in a video produced by the U.S. Patent and Trademark organization.

Researchers note that “the cultures that male and female students from all backgrounds, races, and ethnicities encounter while they study STEM can undermine or support their performance and persistence” (Malcolm & Feder, 2016). Students make connections between what they learn and themselves. These connections can last a lifetime, impacting achievement throughout their years of formal education and



into their lives as adults. At Camp Invention ASL, deaf and hard of hearing students and their families learn from deaf leaders in science and technology in ASL. These are the qualities that drew us to establishing and working in Camp Invention ASL as well as helped us centralize our bilingual mission and guide our planning for a future—a future in which we hope there will be flying cars, powered by environmentally safe fuel, designed by a graduate of Camp Invention ASL.

*The author thanks Jill Bradbury for her contributions. A professor of English at Gallaudet, Bradbury enjoys languages of all types, including mathematics. She served as director of Camp Invention ASL for two years and looks forward to working with Joseph Santini at the camp again this summer.*

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