

Future Reflections Winter 2013

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Teaching Math Skills and Building Relationships

by Gloria Isidro-Villamizar

From the Editor: When teachers work with students, the academic subject is naturally the primary focus. However, as Gloria Isidro-Villamizar points out, the teaching process can also strengthen relationships and help change attitudes about blindness.

Several years ago I started tutoring blind students in mathematics. Some were enrolled in a regular school program and some attended the National Institute for the Blind (INCI) in Colombia, Puerto Rico. The work brought many challenging moments. I welcomed these challenges as opportunities for learning and professional development.



To become the coach I hoped to be, I had to learn how the students functioned at school and within their families. I visited the students at school and interviewed their teachers, inquiring about the teaching methods they used. I met the parents at school, and most of them invited me to visit their homes. These visits helped me get to know the students in their home environments.

The youngest student that comes up to my mind is Laurita. She was eight years old, and she had a ten-year-old brother. As I tutored Laurita at home, I noticed that her brother showed little understanding of her situation. He seemed to reject her because of her blindness. I closely observed what was happening and decided to involve Laurita's brother in our tutoring sessions. If we all worked on math together, perhaps his attitude toward his sister would begin to change.

The experiment worked just as I imagined. After the second tutorial, Laurita's brother was willing to join us. He even prepared the teaching area and had the materials ready by the time I got to their house. Working together to review math concepts helped the children learn to deal with each other and brought them closer.



Experiences such as this one showed me that the process of instructing blind students in math is strengthened when we, as teachers, involve the student's family, classmates, and friends. This realization gave me the idea of bringing together classmates, friends, and family members as a team to design materials in high and low relief for teaching math concepts to blind students. The result was a tactile Cartesian plane that showed points in relation to vertical and horizontal axes. The main axes were shown in high relief, and

the secondary axes were in low relief. There were holes at the points of intersection. Geometric figures could be formed by using flat nose studs and wires.

I recalled my experiences teaching blind students years later, when I arrived at the University of Puerto Rico/Río Piedras (UPRRP) to pursue a master's degree in mathematics. I drew upon my knowledge when I had the opportunity to design the Adapted Mathematics Course for Visually Impaired Students. The course is now offered by the Department of Mathematics in the College of Natural Sciences at UPRRP. It is available, in Spanish, to all students with disabilities and to special education teachers in training at



<<http://matematicaadaptadaparaspersonasciegas.blogspot.com>>. The course provides students with written materials in Braille and large print as well as tactile materials, the Cranmer abacus, talking calculators, and computers with the JAWS screen-reading program.

The use of tactile materials and other adaptations often sparks the curiosity of classmates, friends, and family. While they review the knowledge they have acquired in the classroom, students have a great opportunity to share their learning methods. One of my blind students at UPRRP visited the UPR radio station for one of his classes. During the visit, people at the station saw him working a calculation with his Cranmer abacus. In response to their questions, he explained what the abacus was and how he was learning to use it. At the end of the semester, this student prepared and recorded a program called "The Cranmer Abacus." The program can be heard and seen on YouTube. (Visit www.YouTube.com and enter *Abaco Cranmer* in the Search box.)

It is very interesting to discover how we can break down barriers and strengthen bonds of friendship

through mathematics. With the language of geometry we can find new ways to interpret the world around us.

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