

**Southeastern University researchers developed a system that uses RFID-tagged toys to teach American Sign Language to deaf preschoolers.**

By Claire Swedberg

Sept. 11, 2009—When early-childhood instructor Susannah Ford takes out her bucket of RFID-enabled toys at the [Louisiana School for the Deaf](#), the children, ages three to five, gather quickly. These small cars, airplanes and stuffed animals look like any other toy, except each is equipped with a passive 125 kHz RFID tag to help the kids learn how to use sign language.

A small number of deaf students in Louisiana and Texas are using this new system, known as Language Acquisition Manipulatives Blending Early-childhood Research and Technology (LAMBERT), to learn American Sign Language. The system, designed and built by researchers at [Southeastern University](#), was first developed in the fall of 2008. An expanded version of the system is now in the works, due to a \$390,000 grant from the [U.S. Department of Education](#) (DOE).



*The LAMBERT system*

Assistant professors Robert Hancock and Becky Sue Parton developed the system, seeking to address the language needs of deaf preschoolers, their teachers and their hearing parents. Software developed by Parton and Hancock enables a child to use an RFID interrogator to scan an item's tag and view a video on a computer screen that shows a person demonstrating that item's sign.

In the 1990s, when Parton was student-teaching at a school for the deaf, she noticed a lack of stimulating instructional tools for kids to learn American Sign Language. Many children of parents who can hear simply are not exposed to sign language until they come to a preschool where teachers can instruct them, and such instruction can often be limited. For example, Parton recalls photocopying pages of words, with each page containing a drawing depicting the sign for a specific word, such as window, and the pages were then taped to the object for students to view. Not only were the signing

pictures difficult to discern since they weren't animated, they were not very interesting.

Although there is computer software dedicated to learning American Sign Language, Parton says, it can often be difficult to manage for small children, and is less palatable for kids since it is all presented on a screen with pictures—with no real objects to see and touch.

The Lambert solution combines the real objects with technology. The system comes as a kit with a laptop or desktop PC, a small RFID interrogator that plugs into a computer's USB portal, and objects with generic off-the-shelf passive 125 kHz tags (made with [EM Microelectronic's](#) EM4102 RFID chips) attached to them. The kits come with 25 tagged objects, from an airplane to balls, household items and animals, all in the form of small toys.

The researchers initially tried bar-coded labels instead of RFID tags, Parton says, but the smaller children became frustrated attempting to scan the bar-coded labels, which were not always readable unless they were presented to the scanner exactly right.

With the RFID system, an item's tag needs to be held close to the reader, at about 90 centimeters (35 inches) or less. The interrogator then captures the tag's unique ID number and sends it to the computer's software via the USB connection. "The code we wrote takes each number and tells the system to launch the appropriate animation," Parton says. The animation includes a 15-second video of an individual signing that item's word, as well as several pictures of the item so the child becomes familiar with the many versions of that object (such as multiple types of airplanes, balls or apples). It then speaks the word for those with some hearing capabilities.

The system also allows the video to be projected onto a 5-by-5-foot Smart Board attached to the computer via a USB cable, so that more students can participate and watch.

Initially, researchers presented a prototype of the LAMBERT system to the Louisiana School for the Deaf, and teachers there agreed to try it. They received one kit with the 25 tagged objects and a computer. Southeastern then provided 10 laptop versions of the kit for the Parent Pupil Education Program (PPEP), for use at home by 10 children up to three years of age. In their homes, the kids could not only practice their words, but also encourage their hearing parents to learn to sign as well.

"One of the biggest problems [in sign acquisition for deaf children] is that hearing parents don't learn sign language," Parton says. Therefore, children of deaf parents who do know sign language have a much higher vocabulary by the time they are school-aged, compared with those with hearing parents.

With the DOE grant, Parton says, Southeastern is now creating a much larger kit with 500 tagged items. Shopping for that many items has been daunting, she notes, and researchers are considering providing tags in the future that could be attached to items at a school or home.

Additionally, the system is now being used by the [Jean Massieu Academy](#) in Texas, with one kit in the

classroom and 10 laptop versions for children to take home. The DOE grant will allow Southeastern to make three full kits with 500 objects—one for the university, and one each for the deaf schools in Texas and Louisiana.

"It's a fabulous system," Ford says. "We use it on a daily basis. For children with no language foundation, it's a huge benefit."

According to Parton, the system could be marketed for commercial use. However, she notes, she does not intend to do so unless additional funding becomes available.