Talking Tactile Tablet

SENSIBLE SIGHT

In our image-laden culture, the inability to see pictures can have a devastating impact on educational outcomes and success in the workplace, not to mention limiting opportunities for entertainment and interaction with peers. According to the National Center of Health Statistics, 8.1 million individuals in the United States have difficulty seeing words and letters, even with corrective lenses. Many in this large and growing US community of blind and low-vision people can read enlarged text or Braille, but making sense of illustrations, maps and diagrams remains a significant challenge.

For those with severely impaired vision, access to images in a format that can be perceived through touch can help overcome the barriers to graphical literacy. Teachers often make raised-line and textured images for their blind students, but these tactile images can only go so far. It’s very difficult to annotate pictures with Braille because the font is so large that only a few, very short labels usually will fit. To address this challenge, designers at Touch Graphics, Inc., recently introduced the Talking Tactile Tablet (TTT), a sophisticated audio-tactile computer device that promises the visually impaired opportunities for fuller participation in many activities. By embedding sounds in tactile pictures, the TTT makes even complex and detailed images accessible. The “viewer” only has to press down on any feature of the image to hear a relevant audio description.

Easy to Use

To operate the TTT, a user inserts one of a large collection of tactile overlay sheets on the TTT’s metal tray, then closes the hinged frame. The weighted frame, which can be connected to either a Mac or a PC that can match specific positions with a database of predefined hotspots, holds the sheet motionless against a touch-sensitive surface that covers the unit’s top. While exploring the images with fingers and hands, the user simply presses down firmly with one finger on a specific location to hear recorded—either human-voice or synthetic—audio information or other sounds describing that graphic area.

Touch Graphics designers also created the Tactile Graphic User Interface, a standard layout for all overlay sheets, to balance the need for simplicity and low cost with the desire to include a variety of features and capabilities in...
the TTT. While considering adding a bar code reader to the device itself to determine which sheet had been mounted, and knobs for controlling volume, speech rate and touch sensitivity, the design team—which included visually impaired members who provided critical first-hand knowledge of features that were must-haves and those that were unnecessary—realized that all of the desired functionality could be accomplished by adding tactile representations of buttons to the overlay sheets themselves. This basic interface includes a limited but versatile collection of icons arranged around a large rectangular work space. Users quickly become familiar with these tools and are then able to calibrate and identify sheets, scroll through menus, make selections and notify the computer when they wish to switch to a new sheet. The interface has permitted Touch Graphics to offer the TTT at a very low price, which in turn has helped drive up sales, building a thriving market for new applications.

One of several engaging and helpful interactive titles offerings produced by Touch Graphics, the National Geographic Talking Tactile Atlas of the World, which includes 43 map sheets that show the entire world as well as the solar system, offers the ability to read and understand detailed maps, a critical—and, up to now, next-to-impossible for blind and low-vision people—skill to make sense of current events. Other interactive titles include a self-teaching curriculum for Braille instruction, a college-level course in statistics and a system for delivering standardized tests in math and science. Games, such as the TTT Crossword Puzzles, and an authoring tool that allows teachers to create their own custom talking tactile lessons for one or more of their students, have also been developed.

**Versatile Applications**

Teachers of the blind and visually impaired across North America and in several European countries have enthusiastically embraced the TTT concept. In the two years since its introduction, more than 300 units have been sold and are in
use in classrooms. Museum professionals are also beginning to adopt the TTT because it helps improve access to graphic materials. The museums that include exhibits produced with the TTT are more welcoming environments for those who avoid museums because of past negative experiences with institutions that maintain a strict look-but-don’t-touch policy.

TTT development was supported through a series of grants from the National Institute for Disability and Rehabilitation Research and the National Science Foundation. These funds were used not only to develop the TTT and its applications, but also were focused on performing market research, managing focus groups and organizing the intensive user testing necessary to ensure that the product truly responds to users’ needs.

The TTT offers new opportunities for learning and entertainment to a variety of constituencies in the visually impaired community: young children, students, professionals, seniors, those who can read Braille and those who can’t, and people who have some useful vision, as well as those who are totally blind, all find the TTT rewarding and enriching. By leveraging customers’ listening and touching skills to offer a device that’s easy to learn, flexible, economical, powerful and endlessly expandable, the TTT appeals to those who have been—until now—excluded from many activities because of a physical impairment.

By Steven Landau

Steven Landau, president of Touch Graphics, Inc., has been developing innovative and practical access solutions for the visually impaired community for the past seven years.