



Eight-year-old Dena Tabyanian and UBC Professor Ken Reeder marvel at how the electronic tutor provides one-on-one customized reading support.

PHOTO: MARTIN DEE

A Magic Reading Box

New literacy software delivers “amazing” results among Vancouver grade schoolers who speak English as a second language. BY LORRAINE CHAN

Most kids would find the *Reading Tutor* a pretty cool classroom buddy. The computer program listens patiently, never laughs at your mistakes, reads out loud with you and sounds out words you don't know or stumble over.

These are the kinds of four-star reviews that UBC education professor Ken Reeder has been receiving from Vancouver's Downtown Eastside grade schoolers and teachers as he test drives a state-of-the-art electronic tutor equipped with speech recognition and artificial intelligence.

Since 2003, Reeder has been collaborating with the *Reading Tutor*'s inventor, Jack Mostow, at Pittsburgh's Carnegie Mellon University (CMU), famed for pioneering computerized speech recognition.

UBC conducted the first trials of the innovative software with English as second language learners as opposed to native English speakers or bilingual students, explains Reeder.

An applied linguist, Reeder is impassioned about helping students acquire knowledge and language. He admits he gets some ribbing about the coincidence of his last name. “People usually expect Reeder to be spelled with an ‘ea,’” he laughs.

His kind smile broadens as he proudly demonstrates the *Reading Tutor* software. “This is one of the really promising uses of technology in promoting literacy, especially with

ESL learners.”

“This is pretty amazing stuff! This is simply the most advanced speech recognition available on the planet. The nice thing about this is that we've got it and Vancouver children are benefiting. Schools are clamoring to get on board.”

Mostow, a research professor at CMU's Robotics Institute, says that he first conceived the idea of using computers to increase literacy in 1990.

“I started by asking myself, what if there were a magic box that could listen to children read aloud, what actions would it take?”

It was from there that Mostow and an interdisciplinary CMU team developed the *Reading Tutor*. This software can be installed on any ordinary personal computer that has at least Microsoft Windows 2000 and at least 128 megabytes of memory.

Reeder got wind of Mostow's impressive study results: children were able to gain a year's worth of reading improvement in three months. However, Reeder pressed Mostow to expand the magic of his reading box.

“We challenged them to work with a more representative cross-section of schoolchildren,” says Reeder. “Up to this point, the *Reading Tutor* had been piloted mostly in Pittsburgh with suburban, native-English speakers.”

“The name of the game in schools today is diverse populations and so the one size fits all reading solution is

clearly going to miss many, many children,” he adds.

During spring 2004, Reeder and his research team conducted a 10-week trial of the *Reading Tutor* at five Downtown Eastside elementary schools. These classrooms, like most elementary schools in large Canadian cities, have up to 50 per cent of the students learning English as a second language.

During a 20-minute session with the *Reading Tutor*, the child dons headphones and reads stories displayed on the computer screen. The child starts off by choosing a story from the menu. The *Reading Tutor* then gets to select the second story, and then they alternate as the session progresses.

“That way the artificial intelligence in the program will adjust the difficulty of the stories that it sets for the young reader,” Reeder points out. “It'll also gauge the performance of the child to keep them moving along just ahead at what they're performing at.”

As the student reads aloud, the program's speech recognition listens. The *Reading Tutor* analyzes the student's oral reading and will offer help to pronounce a word, read along with the child or just signal with colored text the word, phrase or sentence that it would like the child to read again.

When the child asks for certain

words to be pronounced, a mini-video clip will pop up, superimposed over that word, and show a child's mouth pronouncing the word.

“That's the beauty of this tool,” enthuses Reeder. “It offers individualized and customized reading practice for young readers. It's one on one — the child has the exclusive attention of the *Reading Tutor*.”

Reeder cites a 2003 B.C. education study which showed that out of 42,000 Grade 4 students, 32 per cent of ESL and 19 per cent of non-ESL students were reading at levels “below expectations.”

“I know teachers would love nothing more than to sit down and work 20 minutes intensively with a child, but it's not physically possible. This technology comes into their classroom and works alongside them and helps children who need a boost in the reading experience.”

Reeder says his research team has almost finished crunching the copious data gathered from the 2004 spring trials. He says the results look good: all four home-language groups and all three English-language groups made gains in their reading abilities.

“We had wonderful results across the board. All of the language groups benefited. We've seen amazing improvements among school children whose home languages are

Hindi, Mandarin and Spanish.”

“Our best result,” says Reeder, “is the fact that the group of children with the lowest level of English coming into the study benefited the greatest. Their curve was very, very steep over just a 10-week period.”

Starting this September, Reeder will install the *Reading Tutor* at three Eastside Vancouver schools for an entire school year.

“For the 2005 study, we're including some Aboriginal learners, not that they're learning English as a second language, but because we know that a large percentage of Aboriginal learners are at risk for success in literacy in school,” he explains.

Although Mostow didn't design the software for ESL reading support, he says he greatly values UBC's third-party, independent study.

“ESL students are like other kids but only more so; they need more support with vocabulary.”

As well, Vancouver teachers have given detailed recommendations, among them pre-reading vocabulary reviews and related activities for students.

“In general when you're trying an education invention, it's not enough to test it in one place,” observes Mostow. “If you get something that stubbornly works under different conditions and settings and different populations, then you've really got something.” □