

## Playing mind games

The Boston Globe

### A new type of educational software aims to improve not just logic but intelligence

By Peter Schworm, Globe Staff | December 19, 2004

Her eyes locked on the computer screen, game controller in hand, 9-year-old Charlotte Levasseur is trying out a new educational software program. But the idea is not to sharpen her vocabulary or math skills; rather, it is to make her smarter.

"The popular perception is that you 'get what you get' " when it comes to intelligence, said Jon Bower, chief executive of Lincoln-based Lexia Learning Systems. "But we believe intelligence is plastic. People can learn to use their brain more efficiently and effectively."

Bower likens a session on the software, called Cross-Trainer, to a mental workout. Just as a runner gains stamina by increasing mileage, children can hone thinking skills through specific intellectual exercises. Once those fundamentals are strengthened, students should be able to learn more across the board.

The graphics and soundtrack aren't fancy, but judging by the smiles on the students' faces as they tested the games last week, they enjoyed themselves.

Levasseur, who lives in Lincoln, faced the challenge of building a bridge. As the game became more difficult, the setting changed from an underground chasm to the Arctic tundra to a desert canyon.

She expertly navigated her cursor through an assortment of symbols that varied by size, shape, and color.

The trick, she explained, was to line up the symbols so that they followed a logical progression. The puzzle has many possible solutions, each requiring a different sequence of symbols. As in a chess game, players have to think several moves ahead.

"It gets pretty hard," she said. "You have to think about a lot of different things all at the same time."

As the game moved along, the symbols multiplied, the variables became more complicated, and the rules got tougher. Levasseur clicked on a symbol and dragged it onto an image of a bridge.

Her eyes flashed in delight when she finally hit upon the right order of symbols. She had built her bridge.

Bower said that students who have used the software have shown encouraging gains. Last summer, 20 students scored an average of seven points higher on a nonverbal IQ test after rigorous workouts with the software. Bower said that study, while not statistically conclusive, suggests that intellect is not a monolith but is composed of multiple strands that can be isolated and strengthened.

Students with learning disabilities have shown the most dramatic improvement, he said. Bower recalled a student with a poor sense of direction who had struggled to navigate a small campground on a recent vacation. After working with the programs, he was able to take a long walk through the woods and find his way back.

Louise Law, director of elementary school in the Frontier Regional School District in Western Massachusetts, said young students in an after-school program -- many with attention-deficit

disorders -- were riveted by Lexia's software, which she described as an "infinitely patient tutor." The games motivated the students because they put them in control.

"It's not taught; they teach themselves," said Lexia's Sharon Colvin, who monitored the student trials. "They learn it much better if they figure it out themselves."

Larry McKnight of LearningRx, a Colorado-based company that also focuses on thinking skills, shares Bower's philosophy that intelligence isn't "a fixed commodity" like height.

"We think it's more like strength," he said. "If you train in a focused, concentrated way, you can change muscle fibers. If you can identify and stress a certain cognitive skill, the brain responds."

Kurt Fischer, director of the Mind, Brain, and Education Program at the Harvard Graduate School of Education, said research strongly indicates that intelligence is malleable and that children's surroundings and quality of education affect general brain power. "It's about half genetics and half environment," he said.

But James Royer, a psychology professor at the University of Massachusetts at Amherst, doubted that improved cognitive skills can translate into broader academic success. "They are improving students' ability to function in a particular domain, but it's questionable whether that's intelligence," Royer said. Doing logic puzzles, he said, may make students better at puzzles, but not necessarily at math.

In the past, Lexia was known for its reading software, used in thousands of schools across the country. But in recent years, it has shifted its focus to specific thinking skills, having received a \$2 million federal research grant. The logic software, slated for release next month, is the second installment in the Cross-Trainer series. Each software license costs about \$500, and 10 schools in Massachusetts now use the program.

Back in Lexia's Lincoln lab, William Watkinson, 13, fished in a virtual ocean in a game that pitted him against Captain Ahab.

Watkinson, who lives in Lincoln, had to scrutinize the fish to find common traits. As he moved through the game, he encountered more fish with more subtle differences.

For a while, Watkinson was on a winning streak. But in the end, Ahab outsmarted him.

"That's mean," Watkinson said. "So what if he's a character in Moby-Dick?"

Don't get mad at Ahab, Colvin told Watkinson. "Think about what you might have done wrong."

Sure enough, he had forgotten to consider water depth.

The students' verdict on the games? Maybe not in Nintendo's league, but not bad for something that's supposed to be good for you.

"It's fun," Watkinson said. "Surprisingly."

Peter Schworm can be reached at [schworm@globe.com](mailto:schworm@globe.com). ■

© Copyright 2004 Globe Newspaper Company.