Every Monday afternoon, little 6-year-old Jon Mari Binkly of Winchester, who has multiple disabilities, rides out to Boston College and, with the blink of an eye, begins to communicate.

A technology of hope

By THOMAS J. FITZGERALD

Thanks to this technology, Michael, a 13-year-old boy from Massachusetts, who can neither speak nor write, was able to say "I love you" to his father for the very first time.

And now a 6-year-old girl from Winchester, Jon Mari Binkly, who also has more than one disability, is using the same experimental technology in the hope that she can one day participate in regular classroom activities at Lynch Elementary School.

The technology, called "EagleEyes," was created at the Campus School for the Developmentally Disabled at Boston College.

It enables the children to use a Macintosh computer; however, instead of using a mouse and keyboard to run the computer's software, they use their eyes—which in many cases is the only part of the body these children can control with precision.

The technology allows Jon Mari to look at the computer screen—and by staring at an object for six-tenths of a second—it will automatically "select" or "click" that object as if working with a mouse or keyboard. Moreover, the technology is continually improving and can now be used with commercially available software.

Not only has EagleEyes gained national recognition with media attention, awards and a display at Disney's EPCOT Center, but there are two Winchester residents responsible for developing and running the project. Peter O'Sullivan is one of the designers of the technology while Frank Carrino now administers the project at the Campus School.

Jon Mari

Three weeks ago Jon Mari made his first visit to the Campus School and after being tested by school officials, he was accepted into the program.

"We feel very fortunate that they selected Jon Mari to participate," says Diane Binkly, Jon Mari's mother. Jon Mari, who is now in the early childhood program at Lynch, visits the Campus School once each week for hour-long sessions on the computer.

Jon Mari has Spastic Quadriplegic Cerebral Palsy, which has left her unable to move much of her body. She is also legally blind.

However, she does have some vision in her left eye, which could prove to be her gateway to regular classroom activities and many more opportunities as the EagleEyes technology improves and as more software becomes available.

Further while she is said to hold back a little with her teachers at Lynch, Jon Mari has just recently improved in her ability to speak.

"Just within the last year, at home she has just blossomed...it's incredible how far she has really come," said her mother.

Because she may not develop sufficient motor skills in her hands, Jon Mari might not acquire the ability to write. One way the EagleEyes project may help a child such as Jon Mari is by providing the ability to do classroom assignments on a laptop computer.

Officials at Boston College predict the technology will become "the book, pencil and pen" for many handicapped students. And as the See TECHNOLOGY, page 26
Learning to communicate with new technology

TECHNOLOGY from page 1

technology improves, it is also becoming miniaturized. The school is working toward making the equipment portable and able to fit on a wheelchair.

Moving to Winchester three years ago from Virginia, Binkly said she and her husband are firm believers in having their daughter integrated into a public school system. They chose Winchester — more specifically the Lynch School — after doing much research. "We feel they have a very dedicated team there and are very open to suggestions," said Binkly.

Binkly also had good things to say about the town's new superintendent, Carol Eaton. "She is absolutely wonderful... it seems that since she has come on board there have been a lot of positive things going on, and I attribute them to Dr. Eaton."

The Eaton connection

In fact, Eaton was the person who discovered the Eaglets technology for Jon Mari.

She learned about the technology while attending a recent workshop for new superintendents. One of the guest speakers at the event was Corwin, who administers the Eaglets' program for the Campus School.

"He was explaining to us how exciting it was to be on the threshold of a new set of opportunities for kids who might not be included in regular classes," explained Eaton. "So when he was done, I asked him, 'Do you have space for a Winchester student?'

Eventually, Eaton hopes to have the new technology installed on some computers in Winchester. "Probably at some point we will have to invest in some of those peripherals," she said, referring to the equipment.

By bringing the technology to Winchester, Eaton is hoping Jon Mari and other multi-disabled children can use the new technology to participate in regular classroom activities. "I think this technology probably is going to be one of the major ways we are able to include handicapped students in the classroom."

According to Eaton, the town's special education budget is paying for Jon Mari's tuition and transportation to the school. "From my perspective, it is a very modest tuition to get into this program," she said. "Considering it could change Jon Mari's life."

The Olivieri connection

Peter Olivieri, a 25-year resident of Winchester who works in the computer science department at Boston College, created the technology along with colleague James Gips.

Both Gips and Olivieri are faculty members at the college, and Olivieri is director of the college's multimedia lab, bringing to the project much experience in not only software programming, but technology and multi-media.

Olivieri recalls how the project began. "We were trying to think of an exciting research area to get involved in, and we thought new ways to control a computer would be interesting," he said.

"We first thought of using brain waves to control a computer," explained Olivieri. "But we discovered it was easier to measure eye movement."

The technology basically works as follows: Electrodes are placed above and below one eye, and to the left and right of both eyes. The electrodes are then connected to an amplifier that is connected to the computer.

"Essentially we are measuring the electro-oculographic potential of the eye," said Olivieri. "It is the position of the retina with respect to the cornea. According to Olivieri, the human body gives off many electrical signals and by amplifying signals detected by these electrodes — by 5,000 times — eye movements can be translated into cursor movements on a computer screen.

Olivieri and Gips started developing the technology in 1993 and quickly began testing it with children with disabilities. "It was a natural to try it out with some of the Campus School children," said Olivieri. "The school is always looking for ways to enhance the learning capabilities of the students."

Early software developed by the pair allowed students to look at the alphabet on the screen, select letters and spell words. Other early software included adventure games and finger painting.

Some of the software now allows the children to look at objects on the screen that will produce sounds.

For example, by gazing at a graphic object entitled "headache" the child can communicate — in words spoken by the computer — that he has a headache. The potential to teach severely disabled children to read, communicate and do arithmetic is greatly enhanced with this type of capability.

We then wrote some software that allows us to use the system with commercially available software," said Olivieri. "That was a breakthrough for the Campus School because there is a lot of educational software that requires a mouse and keyboard... that is what Jon Mari was using today."

Olivieri added that Jon Mari is a quick learner. "Jon Mari is very good at it and we have several others who are good at it as well."

The Curran connection

Another Winchester connection to the project is Frank Curran, who...

Continued on next page

St. John's Preparatory School

Offering a challenging college preparatory curriculum for young men, grades 9-12

- Nationally known reputation for excellence
- Wide spectrum of extra-curricular and athletic programs

OPEN HOUSE

For 8th GRADERS AND THEIR PARENTS

Sunday, October 22 - 10:00 a.m. - 1:00 p.m.
Saturday, November 18 from 9:00 a.m. - 12 noon
Sunday, December 3 from 10:00 a.m. - 1:00 p.m.
Entrance Test - Saturday, December 9 - 8:30 a.m.

Located on Summer Street in Danvers
One half mile off Route 62, between Routes 1 or 95 and Route 128
Call (508) 774-0950 or write ADMISSIONS OFFICE
St. John's Preparatory School, 72 Springfield Street, Danvers, MA 01923
A Marianist Brothers School for Eighty-eight Years

DREAM HOMES DO COME TRUE.

Storewide Autumn Sale

Enjoy once-a-year savings on New England's finest collections of ceramic tile, terra cotta, and natural stone... with the uncompromising service that is our trademark.

Tile Showcase

The tile resource for architects, designers... and you!

Woburn: 293 Main Street (617) 935-1300
Boston (Frank): Boeing Design Center, Suite 630 (617) 426-6535
Southshore (Grand Opening): 255 Swampscott Road, Suite 9W (508) 229-4460

An elegant home to be built with wonderful details and amenities throughout.$1,100,000

Condo alternative! Peaceful haven, expansive view, sparkling ranch! $169,500

"Introducing Heritage at Winchester"

An elegant home to be built with wonderful details and amenities throughout.$1,100,000

Wanted it? This magnificent home will be built to satisfy your dreams.$1,200,000

Property Information 24 Hours a Day, 7 Days a Week
Dial (617) 756-0077 or (508) 443-0077

MASSACHUSETTS HOME SELLER

WINCHESTER

3 Church Street
729-7290

Recently painted, close to town, exceptional facilities & transportation. $179,900

"Introducing Heritage at Winchester"

Bordering the Winchester Country Club! A priceless view! $8000

"Introducing Heritage at Winchester"

"Introducing Heritage at Winchester"
Jon Mari’s magical adventure with technology helps her to communicate

PHOTOS BY KARA DONOHUE

From previous page

now runs the EagleEyes project at the Campus School.

Curran has developed a curriculum for the students, who are mostly multi-disabled or non-verbal, and has been coordinating the program for about a year. Curran also teaches epistemology in a doctoral program at Boston College.

Jon Mari is one of only three students enrolled in the EagleEyes program who is from outside the Campus School. Other students in the project are more severely disabled and are attendants of the school, which is a daytime educational facility for students ranging in age from 3 to 22. "Jon Mari, with all her limitations, is still in many ways less restricted than the students at our day school," said Curran.

Curran said his first goal with new students like Jon Mari is to train them to control the cursor with accuracy.

"Whatever a mouse can do, your eyes can do," he said. "But it takes time; it takes about ten months before they are able to really control that cursor and make it do what they want.”

After learning to control the cursor, the next goals are: letter recognition, word formation and sentence construction. "Then I want to get into numbers," says Curran.

It is difficult to predict exactly where the Eagle Eyes project will lead; however, one thing is for sure: it is a technology of hope and opportunity that is expected to vastly improve the lives of many, and it may be just be the first step toward something even more awe-inspiring. "We are excited about incorporating virtual reality and brain wave control systems into our current research," says Olivier.