

SeymourPapert:
Computers, Kids & Powerful Ideas

BY DAN PAGE | PHOTOGRAPHY BY STEPHEN SHERMAN

FINDING WAYS FOR CHILDREN TO INTERACT WITH COMPUTERS BECAME THE CORE OF PAPERT'S INTERESTS. "ALMOST AN OBSESSION," HE SAID.

Seymour Papert has been called "the country's foremost expert on children and computing." He is perhaps best-known as the developer of Logo, the most widely used programming language in our schools. But his visionary ideas about children and computers go far beyond this ingenious software, which has introduced countless children to the power and creative force of computers. He is a true prophet of the Digital Age and an eloquent philosopher on the technological revolution that is changing the educational landscape around the world.

He is currently involved with MaMa Media, an online magazine designed to introduce small children to the computer/Internet culture through child-centered topics, games, conversations and tools for building their own Web pages. He is working with developing countries, helping them to create new models for technology-based learning environments relevant to their cultures and economics.

In the early 1960s, Seymour Papert came to the Massachusetts Institute of Technology where he and Professor Marvin Minsky codirected the MIT Artificial Intelligence Laboratory. At MIT, Papert had an opportunity for the first time to work with some of the earliest interactive or time-shared computers. "I found that in a few days I was solving a number of mathematical problems that had been bothering me for years. I was able to play with the computers and spend as much time as I wanted to solve these problems." Papert's fascination with computers and how children think proved to be potent combination.

Finding ways for children to interact with computers became the core of Papert's interests. "Almost an obsession," he said. "I was motivated to develop the Logo programming language because I wanted to give children the power to access the computer, and to have that power they needed a language that would allow them to tell the computer what to do. I wanted to open doors to allow children to use the computer as an intellectual tool without having to know algebra or mathematics and without concepts such as variables. I wanted to bypass math concepts and go directly to mastery of the computer."

He feels that many schools, at least in the beginning, seemed to miss the point. "Logo is intended to be a programming tool that allows children to explore, communicate and to solve problems," Papert observed. "But all too often it is taught as a subject in itself, which is completely contradictory to the original purpose." One large metropolitan school system even administered a true/false exam to test students' knowledge of Logo, never realizing such a test was in direct opposition to the whole philosophy under which the language was developed.

UNREALIZED POTENTIAL

For Papert, computers are a window on the universe. They provide access to a vast range of learning experiences children may explore on their own, at their own pace and within contexts of their own set of skills and interests. The problem today is two-fold. Computers are still at a relatively early stage of development, so their full potential as a tool for creativity and learning are still in infancy. Too often cybercritics focus on the existing limitations of computers and fail to comprehend the rapidly expanding potential. In addition, current schools are organized on the basis of precomputing technology, which does not take into account the pedagogical power and flexibility becoming available through the accelerating evolution of computer technology.

"Children can feel the freedom and power the computer gives them," Papert observed. Moreover, the computer allows them to learn in ways that are most natural and deeply rooted. In his most recent book, *The Connected Family, Bridging the*

Digital Generation Gap, Papert wrote, "Watch a baby explore the world. Everything within sight is seen, everything within touch is felt by hand, by foot and by mouth. The full range of available sounds is emitted. The baby is exploring a small world, but is exploring it very thoroughly." Evolving computer technology is allowing these same learning proclivities to be applied, developed, refined and extended to enable children to explore with growing knowledge and sophistication a much larger world that can be more fully experienced by all the senses. Audio, video, Internet, 3-D and virtual reality, all these emerging technologies are helping to extend computers into new realms of learning possibilities.

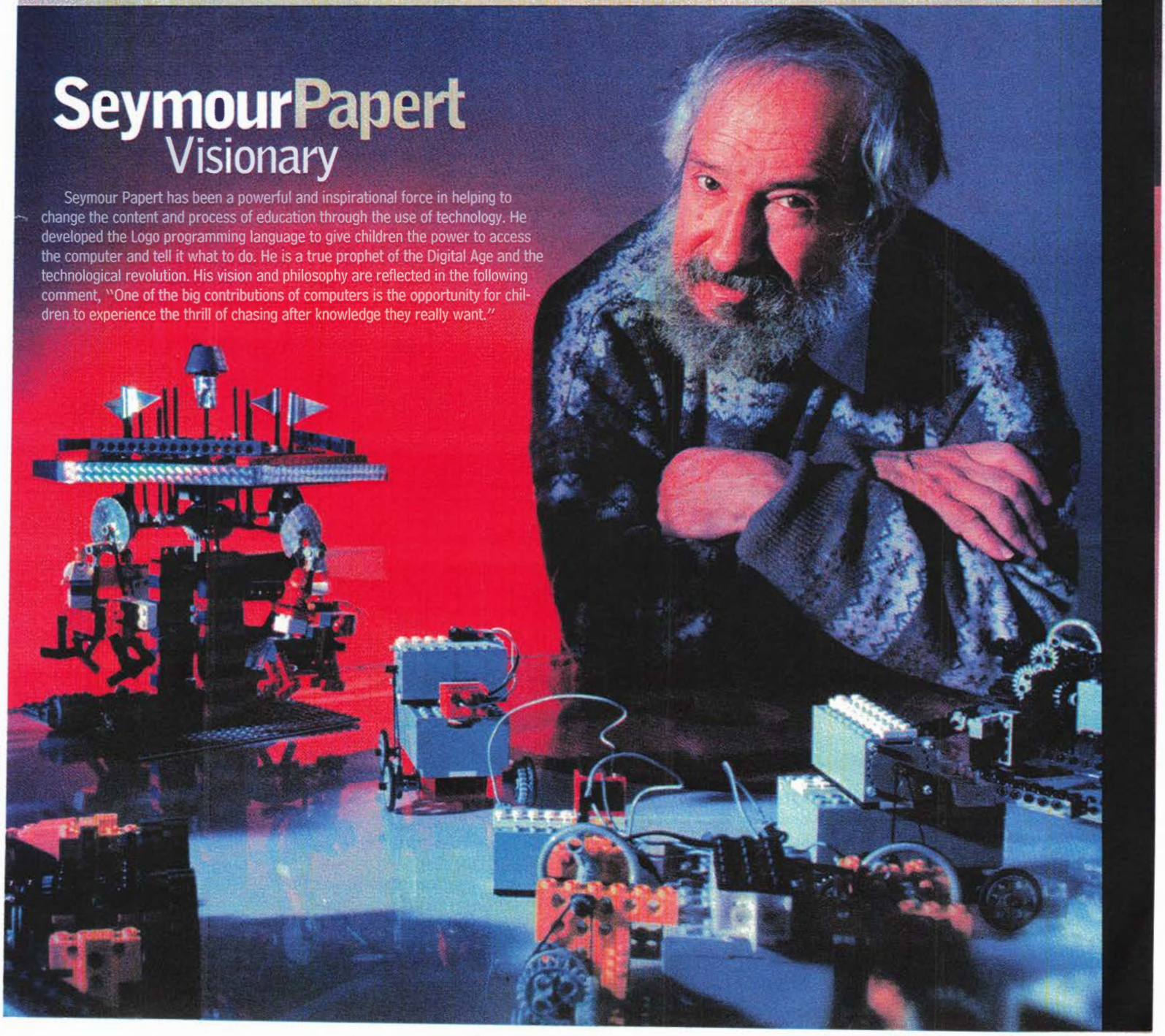
PAPERT'S PHILOSOPHY

Where Papert tends to draw the most fire from critics is in his outspoken opposition to the instructionist model of teaching, the traditional, precomputing model of education in which students are segregated by age, the curriculum is divided into discrete subjects, and the pace of learning is adjusted to the average student or below. "The worst way to learn," Papert said, "is to have all students ensured of an equal state of ignorance."

Papert's philosophy, which is often referred to as "constructivism," focuses on a model that says, in effect, learning occurs most effectively when children are exposed to a powerful idea and then encouraged to do something built around that idea. According to this model, a powerful idea is one that increases a child's thirst for knowledge and leads the child to explore a wide range of topics in search of answers. "Computers offer freedom of choice and the opportunity to be creative," Papert

SeymourPapert
Visionary

Seymour Papert has been a powerful and inspirational force in helping to change the content and process of education through the use of technology. He developed the Logo programming language to give children the power to access the computer and tell it what to do. He is a true prophet of the Digital Age and the technological revolution. His vision and philosophy are reflected in the following comment, "One of the big contributions of computers is the opportunity for children to experience the thrill of chasing after knowledge they really want."



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Papert said that schools are changing from the older models. The change, he believes, is inevitable. "As more children are growing up with computers and the Internet, it is becoming part of the natural order of things. As children begin to appropriate the computer as a way of getting at knowledge, solving problems and communicating, they will not put up with teaching that does not measure up to the learning experience they know is available with the computer.

"We are also getting a new crop of teachers now who are more comfortable with computers and are breaking down resistance within the schools," Papert said. "In any case, the problem is less with teachers and more with schools. The traditional educational model is simply wrong. Segregation by age with an authoritarian teacher, breaking the day into periods, it's all too much like a production line."

HIS VIEW

When asked what would the ideal learning environment be, Papert replied, "That's like asking what is the ideal marriage. It depends entirely on the needs and personalities of the individuals involved. The problems with the traditional system is not everyone learns the same way. The beauty of the constructionist environment is you don't have to decide *a priori* what the ideal mode of instruction is. You develop the structure as you go along, and individuals have the opportunity to learn in individual ways."

As he wrote in *The Connected Family*, "... the real contribution of digital to education is a flexibility that would allow every individual to find personal paths to learning. This will make it possible for the dream of every progressive educator to come true: In the learning environment of the future, every learner will be special."

What will the learning environment of the future look like? Papert believes it will be a vibrant and exciting atmosphere with beginners and experts all together, learning from each other. "Experts will be learning what kids need to know," Papert explained. "How they absorb knowledge best, what motivates them, what their interests and preferences are. Kids will be learning what experts have to teach and using technology to become good self-learners. This model works in families, in the work place, and it worked in earlier societies prior to assemblyline schools."

REMOVING BARRIERS

Papert's vision acknowledges what educators have always known, regardless of what educational model they subscribe to: There is a connectedness that is inherent in learning. Anyone who has ever seriously undertaken a course of self-learning is acutely aware that the process by its very nature ensures you will bump up against all manner of new obstacles, concepts and subjects to be mastered. A child who is motivated to do something, quickly learns that language skills are crucial. If children can be motivated to dig deeper, they soon find on their own that history is often useful; that math is indispensable for analyzing, measuring and quantifying; that well-honed observational skills and a repertoire of analytical tools are extremely helpful.

Papert's genius, in part, lies in his recognition that computers, even in their present relatively primitive state, may remove barriers to learning, stimulate children to look for answers that work and provide access to knowledge, information and tools. As such, computer technology itself is one of those powerful ideas that brings us into contact with a vast and rich arena of learning opportunities and provokes further exploration by the adventurous and curious child that lives in all of us. ■



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