Computers are not information, they are constructive building material

Berni Dwan talks to Seymour Papert
about how computers amplify the intellectual capabilities of children

Seymour Papert says computers are less relevant as sources of information than they are as tools to enhance the intellect.

I HAVE an old, tattered and much-loved book called *Mindstorms,* a seminal work about children, computers and powerful ideas. It was the kind of book that energised my head and rekindled my interest in something that I was becoming disillusioned with – how to give children the freedom to learn in imaginative ways through technology. In *Mindstorms,* the author saw new technologies as being powerful contributors in the enhancement of learning by creating personal media capable of supporting a wide range of intellectual styles.

I often thought I would like to meet the man who wrote this book, and after 20 years I had the pleasure of meeting Seymour Papert in Media Lab Europe this May, and he very kindly signed my copy of *Mindstorms.* The occasion was a conference on ICT in education – "New Futures for Learning in the Digital Age held in collaboration with the Department of Education & Science and Media Lab Europe. ICT is a term by the way that does not sit easy with Papert: "I hate that acronym too, it's not only about information, it's about doing things."

Nonetheless, the conference focused on the potential of digital technologies to transform and enhance the learning experience and on identifying the challenges and opportunities for policy makers and those who deliver education to develop and exploit this potential.

I ask Papert, who spent the early part of his career working with the famous child psychologist and educational thinker Piaget, what is your big insight that you have spent over 30 years pursuing?

"What I took from working with Piaget was a sense of conflict, a dilemma. All of the work I had been doing with him showed what powerful learners children could be. And yet, when you put them in school, to get them to learn much less than they have been learning spontaneously outside the classroom, you have to invoke all these complicated structures – and I thought, what could change that?

"I had come to a conclusion about why some things are done so easily and some are not. Part of it is what is innate in us – but part of it is about what materials are available to us to build with intellectually. Things that are in our culture, children learn easily – things that are not, they don't. I couldn't imagine at that time what could bring about a change in culture that would change learning."

But where did it all begin?

"On my first day at MIT I was waiting to meet with Marvin Minsky, but he was late. There was a free computer sitting there, most unusual in the 1960's when you had to sign up weeks in advance for a half hour of user time. I played and played with it and I started seeing how I could solve a mathematical problem that I had been working at for a long time. Suddenly I realised that the computer could amplify my own intellectual powers, and wow that was it. Computers could amplify the intellectual powers of children, they were the ones who really needed this. And that was life changing. From that moment it was clear to me that one day, children were going to use computers as their own intellectual tool."

But children need to be active producers rather than passive consumers if they are to benefit from technology.

"The term information age is also misleading, says Papert. "The real impact of the computer is that it really makes things happen that could not have otherwise happened. The computer is not information, it's building material, something constructive, and I want to give it to kids like that too, to use it as a means to do things. The idea that the kids need to program the computer is absolutely essential. It is so anti-educational that you put this thing into the hands of children and let them be consumers of software rather than having them produce it. I think that the schools are being irresponsible too – they should be giving a lead in how to use computers in effective ways.

"One of the best projects I have seen in Ireland is Empowering Minds led here in MLE by Deirdre Butler. It involves building programmable things out of Lego, and that is something that I developed at MIT. An interesting thing that we found, especially with the very young kids, is that girls do better than boys, and there's an interesting reason why.

"On the whole, if you give this sort of material to a boy and say, build anything you like, many of the boys will want to build a vehicle that will go fast and hard, and if it breaks the other guy's that's all the better. Girls are less obsessed with a single idea, and do a greater variety, and so they master it more.

"While the speed obsessed boys want something that will go away, the girls want something that will stay with them that they can interact with.

"One seven-year-old girl succeeded in making an object move in a pattern so that she could dance with it. That is a more sophisticated thing to do. The girls are thinking more vertically, and the common opinion that technology is more attractive to boys than girls, is reversed. The idea that a computer can really become part of the life of the child is now within the time horizon of practical educators. I think we are going to see a huge wave of this over the next few years."