MAKING SENSE OF THE COMPUTERS PLACE IN THE LEARNING ENVIRONEMENT: A HISTORICAL EVOLUTIONARY PERSPECTIVE (Abstract)

Seymour Papert
Epistemology and Learning Group, MIT
USA

1. One way to make sense of something is by developing concepts for thinking about it. In the case of informatics in education we need a lot of concepts: we need concepts for thinking about informatics, for thinking about education and for thinking about the way the education world thinks about informatics in education. The third group is especially important. One thrust of my lecture is that thinking on this subject suffers badly as a result of weakness on this methodological "meta" level. The worst mistakes in thinking about the uses of computers in schoolsÊcome from asking the wrong questions rather than from giving the wrong answers to the questions being asked. Many "wrong questions" take the form of asking how much children learn from using a particular piece of software. A better question is to ask what the particular piece of software means for the long term development of the learning environment. Of course in the long run the "bottom line" is about what is learned. But what is learned tomorrow by following a certain method can be a very bad indicator of what will be learned by following that method for ten years.

2. Another way to make sense of something is to develop concrete "objects to think with". From this point of view Logo historically served two purposes. It was good for children (and others) to use. It also allowed many educators to think more concretely and richly about the idea of programming. But many of these educators fell short of the benefit to be gained in this way because they could see only one or two of the many forms Logo has taken. I shall show how Sprite Logo, LogoWriter, Microworlds, Object Logo, "lego-Logo", "star-Logo" are each especially good for thinking about programming from different angles.

3. Yet another way to make sense of something is to find connections with other things. In education circles "programming" is often taken to refer only to writing instructions for computers. But this does not do justice to programming as a "powerful idea". Connecting programming with ideas like "algorithm" widens it a little. But real width requires connection with animal behavior, with genetic coding, with engineering principles, with constitutional law etc., etc. These are not "analogies" to help children understand how to write computer programs. They are fundamental ideas that have become central to late twentieth century thought.

4. A third way to make sense of something is to see how it evolved, to treat it historically. Many aspects of our education system make no sense unless they are understood historically. (A good analogy are the QWERTY and AZERTY arrangements of keys on a typewriter; they are not maintained because they are best, they are there because of history.) The ways in which computers are used in schools must be understood similarly.

5. The historical approach is essencial to avoid confusion in discussing policy questions about the future of computers in learning. For example, it is silly to engage in discussion about whether children "ought" to use computer or whether they ought to use them for only a limited time. Historical trends in our society make it inevitable that they will use them, they will use them most of the time they are doing any formal work. It is silly to ask at what age they should start using them. They will start from the begining. It is inevitable that the computer will eventually be the primary writing instrument in and out of schools. We have to learn to separate historical trends from educational choices. Enormous energy is wasted on "research" or "evaluation" by people who are under the illusion that they are making a choice.

6. Of course some choices are real. For my lecture I shall take as my main example the set of choices about what kind of programming should be encouraged in informal life and built into "curriculum" for formal learning. But I hope to end up showing that the choices are not what most people think they are. Inevitably people will ask me whether this will be "Logo". My answer is to ask a different question. Many years ago there was a baby that grew up to be me. We usually say that the baby "was" me... but you probably would not recognize it if it were brought here in my place in a time machine. Some of you might even complain to the organizers of the congress!

If you insist on a straight answer here it is: Yes, I think that Logo is a point - or rather a segment - in a historical trend that will continue into the future. Should teachers continue using Logo? Yes, but only if they see as a phase in a developing trend into the future and if they want to be themselves part of a trend into the future.