A comment on the World Summit on the Information Society, Tunis 2005

In November 2005 the United Nations, the International Telecommunications Union and the Tunisian government hosted the World Summit on the Information Society. Participants showcased a colorful array of tools for developing communities, including e-learning programs.

In the midst of the lively scene, Kofi Annan helped to introduce the "$100 Laptop." It captured imaginations and dominated discussions as participants recognized its potential to shrink the digital divide.

However, an underlying assertion went unsaid. Getting computers into more people's hands would only begin to address the digital divide. Deeper issues concern how people think, what they think about and how computers can help.

When many more people can use spreadsheets, search engines, word processors, management systems and other "information and communication technologies," we will have bolstered the labor force and digital media industries will play a significant role in developing communities. But these are only baby steps toward realizing the "knowledge society."

The lasting power of readily available computation – and achievement of real computer literacy – will evolve through many people making their own computer programs and thinking in ways that this activity promotes.

Programmers learn to think about interrelating parts that give rise to dynamic wholes. They create systems that can cope with diversity and change. They use ideas that pertain to many aspects of our social and physical worlds.

We function in multivariate, dynamic systems all the time – systems like traffic, weather, economies, physiologies, families, organizations and cities. Each of these systems operates as a change in one variable affects many others. The number and character of these relationships create complexities that can make it hard to understand a system or how it will act under different conditions.

Computers can help, through simulations that model a system's parts and their relationships, and let us experiment with changes. Many scientific and humanistic topics can be fruitfully represented in this way. Simulations are helping people to understand aspects of pressing challenges in today's world: food resources, water scarcity, energy resources beyond fossil fuels, climate change, biodiversity, pollution, and human population growth.

Interacting with simulations of these complex phenomena can help to increase global awareness and improve potentials for sustaining our ecological, economic, and other shared environments. But these potentials would improve even more if many people could understand how such systems function.

Creating a computer program is a good way to deepen this understanding. When we "write" a program we are developing a dynamic system. We define a variable and relate others to it; we try a change and see what happens.

In doing so we increase our facility with computers, becoming more adept than if we were just using search engines or spreadsheets. We also hone our abilities to recognize, understand, use and shape changing relationships – in the computer program and as we participate in systems of everyday life.

The fundamentals of computation, variability and feedback, characterize dynamic systems everywhere. Today we know that even young children are capable of understanding these ideas – but there are still too few opportunities to engage and develop them.

Curricula need to support personal creativity via programming, as a method for deep and broadly useful learning. A good place to start is through modeling dynamics as they occur in systems of the natural world.

Some curricula with this focus are including studies of the motion of animals and of human-made things that move. The beauty of focusing on dynamics of physical motion is that learners can include movements of their own bodies among the experimental media. The Learning Cyrkus design is an example.

The overall approach takes seriously the idea that personal development can be a strategy for regional development.

- Carol Strohecker, 2006