

E-clips

Introducing Technology

Dr. Jeffrey Trawick-Smith (Host): Although introducing very young children to computers has become quite common, sometimes we hesitate for a wide variety of reasons. Dr. Doug Clements from the University of Buffalo and Dr. Sudha Swaminathan from Eastern Connecticut State University encourage us and give us the keys to success.

Dr. Doug Clements (Expert): What we found lately in mathematics education and in technology education is that computers can really help kids bridge the worlds between their concrete experience and abstract mathematical thinking at a very young age.

Child: (counting) 3, 4, 5, 6, 7, 8, 9, 10!

Dr. Clements: So we know that young kids, two, three years old, can abstract very interesting ideas, and can symbolize them, at least in spoken language, and very soon in written language as well. So where does the computer, where does technology fit in all of this? Technology can put on the screen multiple representations of these kinds of ideas, and connecting those representations can help kids bridge the world between concrete—four blocks—and the abstract idea of four. But we now know that concrete is much more about meaningfulness than it is about physicality. So that when kids see four objects and there's picture of four dogs on the screen, that's as meaningful to them as having four dogs. And indeed, the four dogs on the screen can be ordered, and thought about, and manipulated with much more control than four dogs running around your floor can be. So that can help kids make the kind of connections between their concrete experience and this new abstract experience.

Dr. Clements: So, where's the teacher? The people that have feared, oh if computers come in, they'll replace teachers, and everything will be mechanistic. First of all, the computer needs to be embedded in a rich educational environment, of which the computer is only a small part. The computer's role in the classroom is to just be one more teaching aid. The teacher is the one that controls that. She's the one that has to pick the educational experiences for the kids on the computer. To make sure they are receiving the hands-on thing, and see the connections between their hands-on work on physical objects and their hands-on work on these computer objects as well. Furthermore, kids are more interested in computers, more likely to learn from computers, if a teacher is nearby and able to interact with them. The teacher is wise to be nearby, not on the kids' back all the time, actually the research shows that if you sit there too much, kids don't learn as much. But if you're available for that question for when kids really do get stuck so you can go over and talk to them about it and engage them in the mathematics that's being presented, it increases kids' learning by quite a bit.

Dr. Clements: If you give teachers less than ten hours of professional development on technology total, the scores of their children actually decreased; probably because teachers tried to use the computer, but didn't have quite enough information to use it effectively. Ten was the cut-off line. And if you gave them more than ten hours of professional development, scores significantly increased. When we think about it from administrators to teachers who would be asking for more professional development than they had before, keep in mind: that kind of quick, one-shot thing may not be the most effective thing. We probably do have to commit a little more if we're going to take computers seriously and do a good job.

Narrator: Eastern Connecticut State University's early childhood faculty member Sudha Swaminathan also researches and teaches early childhood professionals about successfully integrating technology into early childhood settings.

Dr. Sudha Swaminathan (Expert): For teachers who are new to this, my first suggestion is to say, "Don't forget the good teaching that you already do." The principles of good teaching, what really counts with young children—being developmentally appropriate, giving them open ended activities—those still hold strong when it comes to educational technology. So if you have just one computer and a couple of software and you want to infuse that into your curriculum, do go ahead and do that, but remember that the computer is not going to replace the teacher. You still need to bring in the objectives that you have for your children. You still need to bring them to use it in an open-ended, creative way. You still need to be an integral part of that whole experience. And I always say start with your comfort zone, and then let's not forget your strength and keep adding to that.

Teacher: And then, you can move your mouse and have better control.