In Dancing Computer, children learn dance and computer literacy while pretending they are a computer

Move over Dancing With The Stars.

A research project at Michigan State University is using dance and movement to help children learn computer skills by pretending they are a computer.

Dancing Computer uses a colorful graphical representation to help children “dance” computer programs. Children learn dance terminology and how a computer executes programs as they perform in groups in a physical space.

“It’s a revolutionary approach,” said Alison Dobbins, an associate professor of Integrated Media Performance Design. “Theatre is used to create a fun, engaging learning environment as children ‘become’ a computer,” she explained. “It appeals to a wide range of learning styles – teaching through visual, verbal, and kinetic methods.”

Video: Dancing Computer

Dobbins said combining computer and dance literacy brings the arts and technology together.

“This approach to learning illustrates to students and teachers alike the value of STEAM (Science, Technology, Engineering, Art, and Mathematics). Students read code line-by-line on mobile devices while moving over a multi-colored tile floor,” she explained. “Their personal execution of the computer program is accompanied by exciting and engaging lights and music. If an error is made, the sound and lighting change. The environment interacts with the students as they pretend to be elements of a computer,” she added.
Laura Dillon, professor of computer science, said one of the goals is to help children read code before they write it.

“Dancing Computer reinforces that a computer follows each instruction exactly,” Dillon explained. “Computers don’t do anything more or less than instructed. Children have a tendency to add movements not called for in an instruction. That mistake becomes evident when they ‘crash’ into others. This teaches them the importance of synchronization when programs are executing concurrently.”

Dillon is surprised by the intensity that the children bring to interpreting and following the instructions on their tablets.

“Initially, they are very focused on just moving to the right graphics tile. But after a few times through they become more fluid - more expressive in their movements. It’s fascinating to see the intermingling of the very different disciplines – programming, art, music, lighting, and dance.”

Charles Owen, an associate professor of computer science, said part of the fun is watching children use movement and expression as they pretend to be a computer executing a program.

“Our aim,” he explained, “is to demystify what a computer does and how it works by showing children that they can learn to do the same type of operations that the computer does.”

Owen also noted that Dancing Computer has connected with groups of students through planned activities, as well as the MSU Theatre Camp, and Lansing’s Impressions 5 and iTec. He said it is working well with a large range of ages.
"Our original target demographics were fifth to sixth graders. We adapted as necessary and now have had good experiences with students in grades 1 to 12. The youngest groups did require extra help with their reading abilities, but from third grade up we have found the students to be quite excited and engaged.

"We had to adapt more to make it challenging for the oldest groups, but the MSU students working on the project were able to create complex dances that were challenging even for high school students," Owen said. "We will invest quite a bit of time in the next couple of months analyzing the data and submitting results for publication, and will be working to make this project available to others though an open source initiative," he added.

Dancing Computer began as an offshoot of Theatre Engine, https://msu.edu/~dobbinsa/. The current one-year project is funded by the Dart Foundation and ends in October.