



Let them give things a go

In a presentation that was blisteringly fierce, ferociously ‘on point’ and breathless in its speed and scope, **Gary Stager** took to the stage at the FutureSchools Expo earlier this year. His mission? To call on educators to create better conditions for students to be creative with computers and technology in the classroom.

BY DANIELLE KUTCHEL

GARY Stager is a famous figure in the industry – a critic, a teacher, and an inspiration. However, he says he wouldn’t have gotten to where he is now if it hadn’t been for those who allowed him to experiment with the developing technology of computers back in the ’70s and ’80s.

“There were smarter people around than me,” is how Stager explains it.

“In 1975, I had a nine-week compulsory computer programming class in a public middle school, seventh grade, where every kid had to take a nine-week program in class.

“And for the first time in my life, I felt intellectually powerful, because we didn’t know what was impossible, we thought anything was possible!”

He recalls seeing a software manual for the first time, and not knowing “what to do with the thing”, because up until that point, all the programs the class saw were written by someone they knew directly. The potential of computer technology was untested, boundless.

Then, in high school, a teacher gave him the keys to the office and allowed him to run the mainframe.

“I had the exact same experience that Bill Gates had, and Paul Allen, and Steve Wozniak, that some adult got a hold of some stuff and said ‘hey kids, see what you can figure out, lock up when you’re done.’

“And like I said, I felt smart, I felt capable, because we didn’t know what was impossible, anything was possible.”



And that's what is, in many ways, central to Stager's push for technology use in schools: we don't know what the potential is unless we allow students to give things a go.

It paid off for Stager, who graduated from school in 1981 and thought that, despite his high school obsession, he would never use a computer again.

Fast forward six months and he was teaching kids computer programming; eight months later, he was teaching the teachers.

Stager is a firm advocate of learning by doing; of giving kids tools and a prompt, and seeing what they can do.

"What's the smallest seed I can plant that generates the most beautiful flower, the largest garden?" he asked his FutureSchools audience.

In conversation with *LeadershipEd*, he explained further how learning can fit within the maker-space movement.

"In the early '80s there was a really strong, vibrant, hobbyist programming community that largely

disappeared for about 25-30 years, and I wonder under what conditions hobbyist programming can return.

"Hobbies matter to people. They're kind of incubators of flow experiences where people can be obsessive about things.

"And so the maker movement, which has kind of been in line with the ideas I've been expressing forever of learning by doing, learning by making, kids having maximum agency, has brought a lot of that back."

Stager encourages teachers to simply give children prompts with their robotics and coding kits, rather than firm directions, and then let them actively create.

"The best prompts are generative - encourage students to develop better hypotheses [and] check their thinking."

Striding across the FutureSchools stage, he threw out some possible ideas: balloon-powered drones, dresses that respond to sound, fitbit shoes. But students need time to get there, he adds - time to

think, learn and craft, time that they often aren't given in schools today.

"Is deep learning possible?" he asks. "When do kids get to do something longer than a course of an antibiotic?"

This does not, however, absolve teachers of responsibility to pass on the skills needed to use technology, program or code.

"... modern learning, modern knowledge

**"What's the smallest seed
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construction, is inseparable from computing.

"Most of what [students] do with a computer is really trivial ... the only thing they come to school with is lack of fear of them.

"So then it's incumbent upon us to channel that, to amplify it, to take it in directions they wouldn't have gone otherwise."

He cautions against simply buying hardware, however, instead saying schools should focus on fostering passion, creativity and fluency.

"I've got a two year old grandson, and I hate the iPad," Stager explains.

"I love the fact that he can see giant road construction equipment anywhere in the world, that's a cool thing - I hate the fact that he's clicking

between videos every one and three quarter seconds.

"I'm not banning him from it, I'm trying to lead him to more constructive uses of it. But some of the hardware leads to more passive uses, which is why schools have to be careful about what they buy."

These days though, as Stager says, the hardware is inseparable from learning and making.

"The computer is the primary instrument for intellectual and creative work - anyone doing anything that matters does it with a computer, so everyone should have one," he declares - but there's more to it than just 'using' it.

"Someone asked me ... 'what happens when we run out of things to do with X?' I said, 'then do Y'. This is an obvious answer.

"However, I am yet to meet any schools that have exhausted X.

"I'd be delighted if kids were exhausting this stuff, but most of what they do is trivial and they do it once or twice and move on to something else.

"The more hardware we throw at kids, the easier it is to create an illusion of having accomplished something ... I'm looking for fluency, I'm looking for kids who can sing and dance and paint with the tool."

The thought leader has some good news for school leaders who might be feeling that their school is behind the eight-ball in the technology space.

"So much of what we do with computers in schools has been utter nonsense for the last 20 years, that sadly it's not hard to catch up - but you shouldn't try to catch up, you should try to leap frog."

Here, Stager says, is where the curriculum can hold teachers back. Curriculums, he says, are based on rigorous assessment at particular levels. However, a lack of progress in creative use of computer technology in the classroom over the past few decades, coupled with a lack of knowl-

edge of what the future holds for technology, means that much of what kids do with these tools is un-assessable.

“I have no idea what a tenth grader would be able to do, programming [wise], if they actually started in prep and continued doing it for ten years,” Stager says.

“I have no idea what a kid could do with Arduino if they did it for more than two lessons. So how are we supposed to assess that, how are we supposed to write a curriculum for it?” he asks.

Is the problem then, that computers have always been ‘tacked on’ to other sections of the curriculum?

Not necessarily, Stager counters.

“Not so much as, we don’t know what kids can do because we haven’t created any context where they can actually become good at something – and without that, the curriculum is irresponsible.

“I want kids to develop fluency, so ideally they have all of this stuff on a shelf or in their back

pocket, metaphorically, and they can choose what they need to use to solve a problem.

“And the future is going to require kids to solve problems that their teachers never imagined.

“So national curriculum is a dopey idea on the wrong side of history...based on this notion that there’s a finite bunch of stuff that everyone needs to know and we know the order in which they need to know it, it’s absurd,” he says.

Wrapping up his FutureSchools presentation to thunderous applause, Stager provided some words of wisdom for educators.

“Every kid should learn how to program, and to do so across the curriculum,” he declared.

“Not because it could lead to a job some day, but because it’s the new liberal art and it gives children agency over an increasingly complex and technologically sophisticated world.

“Valuing creativity is a minimal standard, even passion is inadequate. We need to invest in teachers and kids and raise our expectations for what is possible.”



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