Pupils at Shrewsbury International School

Creating the Future Workforce

Creativity has always been off limits when it comes to the type of functions robots might master in the future. Not so anymore – and it's down to educators to find the right balance that will prepare students for jobs that are yet to be invented. – By Sarah Graham

The robots aren't coming, they're already here. And to top it all, they're getting more creative.

Where once automation of the workforce was confined to jobs that could be carried out through algorithms that learned from repetition, like assembly lines and engineering, we're now seeing roles in the creative industries being taken by robots. Journalism was one of the first to see the crossover, with news organisations including Forbes and The Washington Post using AI to assist journalists by creating first drafts of news stories and business reports.

Just last December, the first piece of AI-generated artwork sold at auction at Christie's for US$432,500. *Portrait of Edmond Belamy* was created by Obvious, a Paris-based outfit that created a sophisticated algorithm to create the work of art.

"The algorithm is composed of two parts,' co-founder Hugo Caselles-Dupré explains in a post on Christie's website. 'On one side is the Generator, on the other the Discriminator. We fed the system with a data set of 15,000 portraits painted between the 14th century to the 20th. The Generator makes a new image based on the set, then the Discriminator tries to spot the difference between

a human-made image, and one created by the Generator. The aim is to fool the Discriminator into thinking that the new images are real-life portraits. Then we have a result."

Similarly, music has been created by machines. In 2017, Flow Machines software, a Sony Computer Science Laboratories (CSL) project, produced the first pop song using AI.

It's difficult to keep up with the pace of technological advances, and even harder to predict the job roles that will be available to those currently entering the education system. This poses an interesting challenge for educators: how can they prepare youngsters for jobs that don't yet exist?

Scott Belsky, Adobe's chief product officer, in January predicted that the development of algorithms in the creative space would be a positive thing. "Automation will liberate us from the mundane and enable us to focus on more engaging, creative, and fulfilling work. We just have to prepare ourselves and our children for the future. And we have to start now," he said.

We spoke to five schools to find out how they're preparing students for future jobs by nurturing their creativity. **B**

One pupil at Kellett School designed an electronic pencil sharpener inspired by Dyson

Simon Wood, Design Tech Lead, Kellett School:

Creativity is an important focus for Kellett teachers in all subjects. Thinking creatively supports students' own thinking and teachers are highly creative in planning their lessons.

Creative subjects are part of Kellett's core curriculum from Reception upwards, and are optional subjects in years 10-13. They are popular and their uptake is high. Creative subjects develop a student's ability to think differently and view the world differently, as well as building a broad range of skills.

More than ever before we will continue to need creative individuals to work in future industries. This new workforce will be doing jobs that don't even exist yet. That being the case the curriculum will need to focus on skills such as communication, critical thinking, decision-making, use of technology. Essentially grounding the individual for 'lifelong learning' so they can quickly assimilate the skills required as these jobs come on line. Industry will need "higher order thinkers" who are analytical in their approach to complex problems. Education needs to help students examine biases, embrace ambiguity, and foster an appreciation for ethical concerns… arguably areas that AI is not that adept at doing.

Lisa Milanec, Head Mistress, Mount Kelly School:

When talking about how you develop creativity with students theredefinitely has been a move away from teachers being prescriptive and a move towards giving children choices about how they might want to create and complete a piece of work.

We don't know the jobs that are going to be available when our students leave school so we need to give them the skills as opposed to just knowledge in order for them to be adaptable for the jobs that will be available in the future. One of the conversations I've had a lot recently is about empathy. Certain specific patterns or processes can be programmed but are we ever going to be able to teach a robot about empathy or understanding people's feeling and emotions?

At Mount Kelly we're looking at how we can use technology to support our students' ability to be creative. For example, how virtual reality can help with storytelling. Children are able to use VR goggles with different scenes and settings to enable them to write about story settings, and describe and discuss what they can see.

Pupils at Mount Kelly School

Maly Pena, Head of Communications, and Kyle Wagner, STEM Director, The International Montessori School:

In 2019 we are still talking about 21st century skills as if they are something students will need in the future. The 21st century is already centuries old. If we don't create the conditions that allow for innovation within our classrooms/ schools, we are already behind. Fortunately, it doesn't require an advanced degree and years of experience to innovate; it simply requires an open mind and willingness to put in place the systems we know create the most innovative results.

Kyle Wagner

It's time to start talking about the 22nd century. And while we can't possibly predict WHAT occupations will still be around, we can predict what skills will be needed.

Creativity. It's the one skill that can adapt regardless of the situation, industry or task. At the International Montessori Schools of Hong Kong, creativity is part of our life blood. Montessori has been promoting creativity by allowing children to make mistakes and learn from those mistakes from a very early age. We dedicate time for creative projects, reward innovative and divergent ideas, empower students to make decisions, allow for failure, and measure what matters most.

Jacqueline McNalty, Principal, Malvern College Pre-School:

We certainly value creativity at Malvern. We believe it's essential and it's timeless, and it's a big part of our early years curriculum. Children are born naturally curious, we use different strategies to enhance that.

You can want to know a fact, but it's what you do with the knowledge. It's going to be those inquiring minds that change the world, that will be the inventors, the problem solvers.

There's a very strong tech side to our program. We have Zenbo the robot, and our pre-schoolers are very interested in getting him to move. We work with a robotics team in Shenzhen who are taking some of these ideas and developing them.

As part of our Forest School, children go out for one day every fortnight, developing creative thinking from that experience in the context of nature by creating pulleys and ziplines – problem-solving to transport things.

Moving away from facts and figures … thinking with a human heart, that's something that can't really be replicated.

Zenbo the robot at Malvern College Pre-School

Ben Keeling, Principal, Shrewsbury International School:

We run a thematic curriculum programme at Shrewsbury. Supported by a wide range of resources, it encourages students to see and engage with the connections between subjects, to consider solutions to multifaceted challenges and to think independently about how best to apply their knowledge and understanding. The balance between freedom and constraint requires intelligent and continual engagement to ensure that students are suitably challenged and truly engaged.

When we talk about creativity in the workplace, we are often referring to lateral thought. An ability to think with clarity, distinction, or connection in search of efficient solutions. Technology will always prove a great partner in this work. As educators, we have a responsibility to provide opportunity and direction – to make sure that our students are well equipped to harness technology and to maximise its impact.