ADAPTABILITY

Alisdair Wade urges educationalists to prepare young people to be ready for an automated future

Many of our jobs, white-collar as well as manual, will soon be done by artificial intelligence (AI). The most recent estimate by the OECD[1] puts the global figure at one in 10. That's a lot of jobs.

As it permeates economies and societies, AI is transforming every aspect of our lives. Algorithms already greet us on our digital devices, influence our purchases, govern our news feeds, and will soon drive our cars. So to ensure we are the ones who continue to pull the computers' strings rather than vice versa, shouldn't we futureproof our children by teaching them all to code?

It's a tempting proposal and it would be difficult to argue against teaching something that is akin to learning a modern language combined with the use of logic. But wait: will all the jobs in the future require an ability to create algorithms?

If the incredible pace of change over the last 20 years has taught us anything it is that predicting exactly what technical skills we will need in the future is folly. Relying on teaching these skills across the board in schools is surely too great a gamble on our predictive powers.

A far more rational approach would be to identify a broader set of abilities and aptitudes – ones the robots are unlikely to master – and look to nurture those in today's pupils. By doing so, whatever the technical requirements of tomorrow's jobs, today's pupils will be able to learn them. We will have armed them with arguably the most important future skill of all: the ability to adapt.

Abilities and aptitudes

What are those attributes? Drawing from the work of futurists we can start to build a framework split into three different categories: cognitive, →

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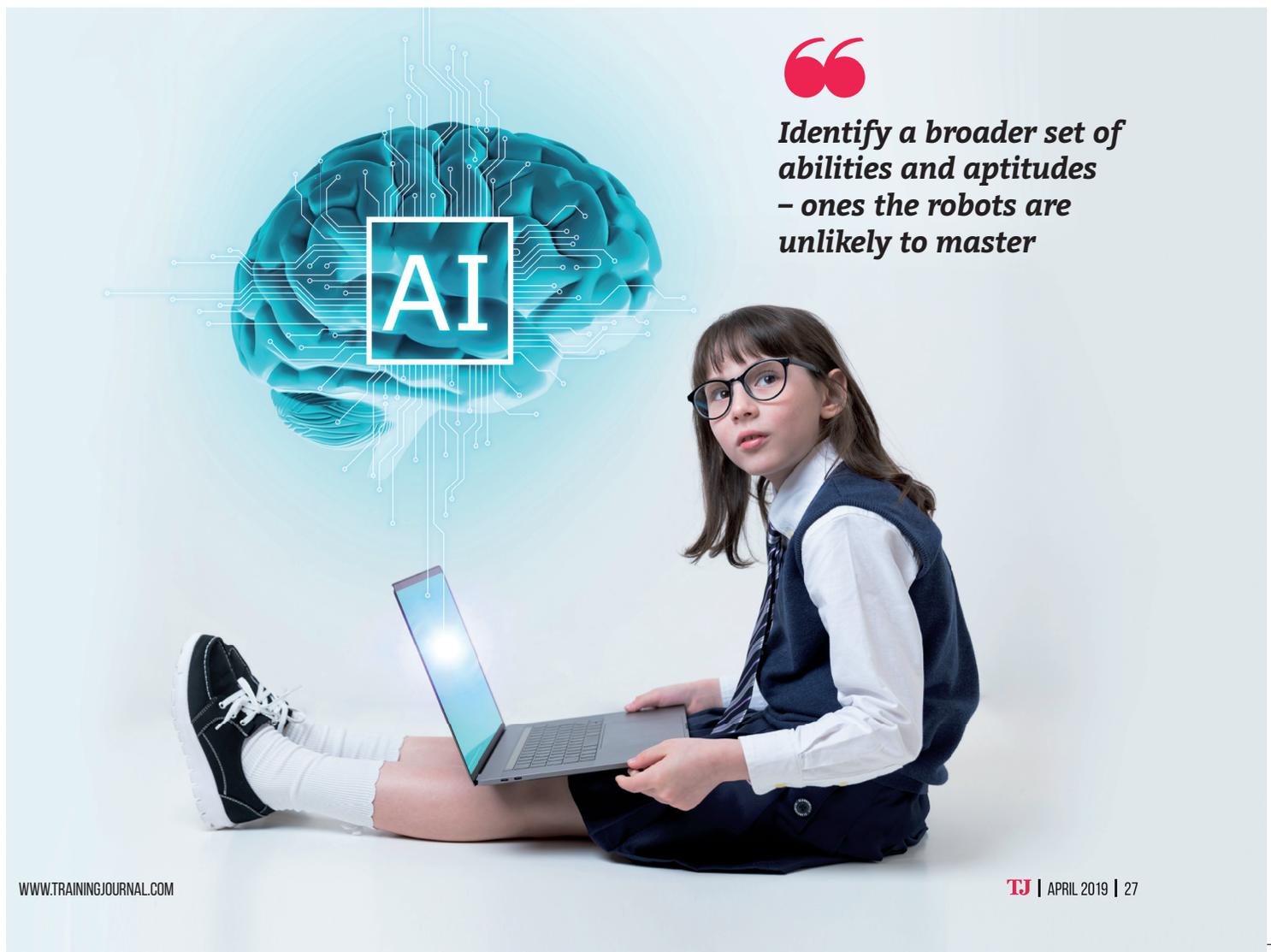
interpersonal and attitudinal. The overarching commonality of all of these is that they will remain largely unique to humans for at least the foreseeable future. For if today's pupils are to succeed, surely the most valuable abilities and aptitudes they can have are those the machines don't have.

Picture a multi-tiered wedding cake: the bottom tier is the ability to recall, the next layer up our ability to understand, the ability to apply sits upon that, then comes an ability to analyse, then evaluate. The cherry on top is an ability to create.

Recall – for and against
Many look at the hierarchy, first devised by US educational psychologist Benjamin Bloom in the 1950s, and label recall as a 'lower order' thinking skill. Lower order, they argue, is the most vulnerable to the rapid rise of technology.

Look at generation Z, they say, whose mobile phones are a physical extension of long-term memory relocated from cerebral cortex to the end of a finger. Why do they need to remember anything if Google or Siri's algorithms can do the retrieval for us?

The defenders of recall argue that knowledge has long been king and we have no knowledge if we can't remember it. Recall sits at the base of a Bloom cake for good reason: it is the platform upon which all other thinking sits. How can we create ideas if we cannot draw on pieces of existing information to make something new? How can we think if we have nothing to think about?

Both arguments have merit. The ability to recall, more or less reflected by good exam grades in our education system, is surely less valuable in the modern world than it was. But nonetheless it remains crucial.

What of Bloom's other thinking skills? Can the machines understand, apply, analyse or evaluate? Yes, though only to varying degrees. Only creativity seemingly remains beyond them, but even that citadel is under siege.

The skills our education system should be developing
So what are the five cognitive skills our education system should be developing if they are looking to

the future rather than the league tables? In addition to recall:
• Creativity – how to connect existing knowledge and available information to generate new thoughts and concepts.
• Critical thinking – how to evaluate and challenge information and ideas as well as question their source.
• Analytical thinking – how to use systems to take an ordered approach to problem solving.
• Metacognition – developing an ability to understand how we think. This is not only to improve an understanding of self but also to enable us to improve the way we can then understand information.

And under the interpersonal skills category? The emotional intelligence that robots will struggle to replicate are likely to be how to:
• Communicate – ideas and thought processes, articulately and appropriately across multiple mediums.
• Listen – to others' point of view and react accordingly.
• Generate positive relationships – through an ability to adapt to a wide range of people across cultures by being aware of one's own and others' emotions, personalities and drivers.
• Work in and lead teams – to be collaborative, open to learning from others and lead when necessary.
• Societal skills – behave appropriately according to circumstance. Show an awareness of, and make a contribution to, wider society.

The right disposition
One might argue that the machines don't struggle with attitude. That is, surely, one of their great attributes. After all, once they have been turned on you can't question their work ethic or motivation to get a job done, but it is also one of their great failings.

Their lack of 'mood' makes them cold and obviously inhumane. So looking at attitudes is perhaps less a comparison with humans and computers, but more with what will set the successful humans of the future apart from the unsuccessful. What are those dispositions?
• Being motivated – having a hunger and the energy to make progress and succeed.

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• Having a growth mindset – believing you can improve and having a positive approach to new learning.
• Seeking challenges – embracing the new with consideration for the associated risk and reward.
• Possessing mental strength – accepting that mistakes and failure are part of the journey towards improvement.
• Humour – an ability to laugh at oneself and to use humour appropriately in context.

Are there education systems that have thought about this? Some have. Singapore has understood for years that its place in the world is largely dependent on its human capital being futureproofed and its education system reflects this. But far too many of those

in charge of education systems are still driving while looking in the rear-view mirror. An obsession with league tables forces teachers on the ground to teach to the test. Rote learning abounds; recall is everything at the expense of all else and with it the love of both teaching and learning is fast eroded. In Britain, it is no surprise to see the CBI and other industry bodies bemoaning the system for not producing work-ready apprentices or graduates.

Thinking Schools

There are, however, pockets of light. There are growing numbers of schools where the focus is the nurturing of independent thinkers and learners. This network of schools ranges from state-maintained to academies, independents, grammars and those catering for children with special educational needs, and includes primaries and secondaries.

These 'Thinking Schools' are accredited by Exeter University[2] and explicitly focus on developing thinking skills in their students. The schools are committed to upskilling their staff so they take on a role more akin 'cognitive coach' than teacher.

Teachers have a knowledge of the latest findings of neuroscience and psychology and how this should be shaping their classroom pedagogy. They know how memory works and therefore how to present crucial content so that it sticks. This is a whole-school approach which uses a common language around developing metacognition that is used in every classroom, irrespective of subject or year group. The same is true of developing emotional intelligence and the mindset required to succeed so that pupils leave school knowing how to cope with and progress any challenge with which they are presented.

In a world in which it will be increasingly complicated for recruiters to find quality employees, it is encouraging to know that some candidates will have been prepared to adapt to whatever challenges the future throws at us. **TJ**

Alisdair Wade is a director of Thinking Matters. Find out more at www.thinkingmatters.com

References
1 https://bit.ly/2EycXeM
2 https://bit.ly/2Thl8qa