Live&Learn Sia Yaw Yoong

Shaping the future with disruptive tech

Educators must help students discover their talents in IR4.0

KEVIN Ashton was the first person who introduced the term "Internet of Things (IoT)" back in the late 1990s. However, the idea of "embedded Internet" can be traced back to at least a decade before the term was introduced. That said, the IoT did not get widespread attention until the acquisition of smart home appliance maker Nest by technology giant Google in 2014.

The development of IoT has gained traction since then, and many have built their products to become smarter and WiFi connectable to allow data transfer to the "Cloud".

In 2016, Professor Klaus Schwab's book titled *The Fourth Industrial Revolution* was published. He subsequently introduced this term at the World Economic Forum in the same year. It has been a hot topic among academicians, politicians and business leaders ever since.

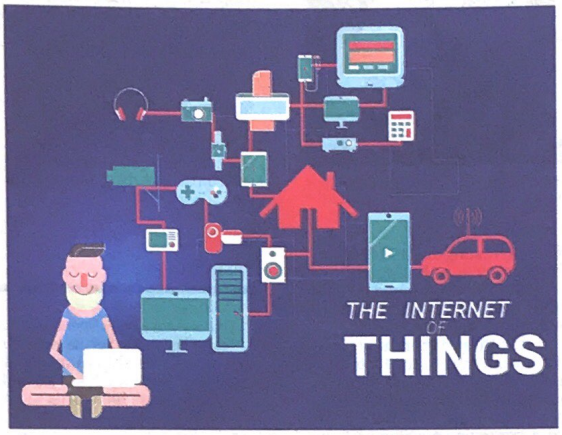
Terms like IoT, cloud computing and artificial intelligence (AI) are often closely linked to the Fourth Industrial Revolution or Industry Revolution 4.0 (IR4.0).

IR4.0 is different from its three predecessors as it involves almost every sector, including agriculture. The development of cloud-based aquaculture monitoring systems has enabled fish farmers to quickly react to unusual situations like water contamination before they become widespread. In addition, the invention of drones and vision systems has changed the way farmers use pesticides and fertilisers.

Similarly, the financial sector is moving towards IR4.0. The banking industry is using chatbots or conversational AI to handle customer feedback. The development of digital wallets has made the payment process easier and the invention of blockchain technology has given rise to the emergence of cryptocurrency, with some envisioning it as the replacement of the current monetary system.

Hence, as educators, our role is to illustrate to students the growth of new technologies and help them to discover their talents. In tertiary education, four-year-long engineering courses must be structured to equip students with relevant engineering knowledge and skills (both practical and soft), ensuring that they gain sustainable career development in the field.

To maintain the quality of graduates, lectures should comprise no more than 100 students per class.



The future is now: From agriculture to healthcare, more disruptive technologies will emerge to transform the way we think and live. — Photo: 123rf

To help educators focus on the development of each student, tutorials should be conducted in groups of less than 30 students.

Lab and workshop practical sessions for at least one module per semester should be incorporated to make sure students are provided with the opportunity to apply the theories they have learnt.

Industrial talks by professional engineers should be conducted at least once every semester with industrial visits organised annually to keep both educators and students abreast of current trends.

Every industry is part of IR4.0. While information technology-related degrees equip students with analytical skills to process data (big data), engineers are needed to design and create components and hardware to make AI possible.

The changes brought about by IR4.0 in the engineering industry have saved mankind tons of time and improved machine efficiency tremendously. The invention of new disruptive technologies like 3D scanning and printing has shortened the duration of the prototype design phase. Material waste has also been reduced significantly through the use of additive methods, as opposed to traditional subtractive manufacturing methods.

Another salient example is the adoption of 3D printing, autonomous robotics and AI technology, which shortens the Terran 1 rocket building time from 24 months to only two months.

Moreover, there is an increasing switch from fossil fuel to electric-powered vehicles, the rate of which is faster than the one predicted by the Energy Industry Administration (EIA). As driving range and battery lasting time are common areas of concern for electric vehicles, Tesla has recently announced that its new battery technology can improve driving range by 54% and at the same time, reduce battery cost by at least 56%.

Additionally, wearable technology such as smartwatches and healthcare monitoring systems has brought so many benefits to the elderly and patients with chronic diseases. These devices help to continuously monitor body conditions and remind wearers of their medication schedules. Athletes use these devices, too, to understand their body while performing their daily training.

From agriculture to banking, and engineering to healthcare, the revolution is ongoing and more disruptive technologies will emerge to transform the way we think and live. The future is now. Are you ready?

Dr Sia Yaw Yoong is the deputy dean of the Faculty of Engineering, Built Environment and Information Technology at SEGi University. He holds a PhD in mechanical engineering, and is an expert in genetic algorithms, programming, and opto-mechanical and vision system design. The views expressed here are the writer's own.