Driven to succeed

Sophie Beyer interviews Singapore's Minister of Education about coding's route into schools

Posted by Rianna Newman | July 11, 2017 | International

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Singapore is a small country with big ambitions. Digital transformation is at the heart of its plans to become a Smart Nation. The importance of computing and technology is recognised by all levels of government: Singapore's Prime Minister is a coder. The government is coordinating significant resources in all sectors of society to enable Singapore to become a world leader in the race to automate. Government agencies such as GovTech and Infocomm Media Development Authority (IMDA) are part of a highly centralised focus on improving the lives of citizens through AI and big data. Small wonder then that coding, robotics and technical skills have become a priority, but how are they being introduced onto the curriculum?

Schools in Singapore have similarities with the UK's. Children take GCSEs at 16 years and A-levels at 18 years. The country is a high consumer of technology. Reports last year indicated that smartphone adoption had exceeded 100%, way ahead of the rest of south-east Asia.

Education in Singapore is not free – although schools are heavily subsidised by the state, parents must make a monthly contribution. It is the norm to fund after-school clubs and extra academic tuition. This means that the Singaporean education is intensive. Children spend lots of time being educated, as parents have invested heavily in their child's schooling.

Singapore now tops the international education PISA rankings of test for maths, science and reading. When he announced the most recent PISA results OECD Secretary-General Angel Gurría said "Singapore is the standout performer in science… They benefit from well-structured, clear and informative science lessons comprising teacher explanations, classroom debates and student questions. And their learning time is productive, giving them the opportunity to build their academic, social and emotional skills in a balanced way."

So science is well-established and outperforms the world. Coding, though, is not yet on the curriculum and schools have not yet adopted edtech wholesale. Singaporean schools are free, for now, to use whatever tools they see fit but there is a drive towards including more technology, according to Minister for Education, Dr Janil Puthucheary. Tech is being brought into Singaporean schools in novel ways to engage children with fun, hands-on projects that deliver short, manageable lessons that are designed to ignite an interest in tech.

Edtech roll-out

The Minister attended secondary school in the UK, at Oundle School, Northamptonshire, then studied medicine at Queen's University Belfast. Before entering government he worked as a paediatrician and university lecturer in Singapore. He was keen to point out the difference in using tech in education and educating children and developing their technical skills. "[In] making sure our kids have the right education, maths skills, science skills and design skills, the use of tech is very important." The Minister is keen to enthuse all to adopt tech in the science and maths curriculum. "We have made a push to try to do more, looking at extra-curricular clubs, to interest kids to follow it as a career and seeing some markers of success."

But when it comes to using edtech he says, "Schools have a fair amount of operational autonomy… we're making quite a bit of technology available. We have a fair number of schools that use learning programmes that use tech: chromebooks, maker kits, robot kit programmes…But what we don't want to do is push out the use of technology for its own sake.We want to focus on the fundamental skills, the maths skills, computational skills and critical analysis. If the teacher wants to deliver that with a pen and

paper I don't have a problem with that."

Things could be set to change though, as the Minister is encouraging a technological progression so teachers can begin to use edtech designed to meets their needs. He says: "At the Ministry level we are developing a number of tools and products that we are going to roll-out system wide. We want to make sure lessons are available online and are propagated across our system. We want to make sure that there is a learning environment that teachers can plug into easily without a whole bunch of tech skills, that they can layer stuff on, tools to develop learning, plans and curate. We want to make this available, so over the next few years we will be rolling this out."

NAS School

At present there is no space for coding on the curriculum, but that too may well change soon given the clear need for digital skills for the country's future, and a number of schemes have been introduced to raise the popularity of digital skills for children and teachers.

Labs on Wheels, run by the IMDA, is the name of a scheme that has been running for around 18 months. It's a tech initiative from an agency responsible for media and tech but deployed in education space. Trained staff bring refitted buses to schools to deliver hour-long projects for primary and secondary children.

ET visited Ngee Ann Secondary School, where children were making wearable devices on two buses parked outside the school, before bringing them back into the classroom to work on them with Labs on Wheels's teachers.

Staff on the bus are clear about what they want to achieve in their hour with the children. They hope to spark an interest and that the children will choose coding as an after-school activity. About 20 children visit the refitted buses at a time, which are kitted out with workbenches, gadgets and a 3D printer. Staff don't spend too much time on theory. After just 10 minutes the children get stuck into a fun project that they can take away into the classroom to code.

Adrian Lim, who leads Labs on Wheels and is a former headteacher of Ngee Ann, hopes it is a seamless transition and paves the way for more tech in the classroom. By parking the buses in the schools for two days he hopes to give kids lots of opportunities.

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Creativity and coding

There is a strong emphasis on creativity and making. Adrian says that, "If coding is just screen-based it loses appeal after a while. If we focus on tech without the making we lose something. I always believe it is good to get stuck with a problem, you learn [that way]. If we make everything smooth we don't deepen understanding and make a big impact, [so] we try not to make things too easy for the kids."

It was clearly an engaging first experience but Adrian is also interested in the longer-term educational rewards, about deepening understanding and embedding into the classroom. "We have excited the kids and the kids want it. Lots of schools have done this and we hope to replicate this more."

So, the children are now excited, but how do the teachers feel about using and teaching technology? "I don't think you can say all [teachers] are comfortable, but I think having the first step to want to try something new, that's what we are looking for." Of course, Singaporeans set great store on the quality of their education. As a former headmaster, Adrian understands teachers' viewpoints and says he doesn't want to push technology for the sake of it. He says: "Everything starts with pedagogy in Singapore. Teachers are very well trained here at the National Institute of Education. Pedagogy is key, it's never the technology first." The teacher's perspective is always considered. "We are very careful in the way we introduce tech. That close partnership between teachers and school is key. Getting the teachers to be confident and give them the support structure is the 'secret sauce'."

Blurring lines

IMDA are getting industry support to give the teachers that digital confidence. Adrian works with industry partners such as Microsoft to train the teachers in parallel to introducing technology to the children. Paid internship and structures to allow industry practitioners to be part of the teaching. It's a key win for Singapore's schools in the tech space.

The Labs on Wheels project has been judged a success. It started with just one refitted bus, now the project has four, such has been the demand to visit from schools. So far the buses have had 60,000 visits from children and have been to half of Singapore's schools. Adrian says: "We do take survey data, and without fail, at every school the kids don't know much about coding, but always we get more than 90% agreeing that they want to do more coding after the bus leaves. Coding, programming, computational thinking – I would say we have achieved a good deal of success. We have a lot of returning customers and the schools want us to come back. Everyone wants a piece of the bus. We take a lot of encouragement from that and we hope to do more."

A further scheme called Digital Makers was introduced in April. Singapore is, like the UK, offering micro:bits to schoolchildren. However, Singaporean schools need to apply with specific ideas of how they will introduce them to the children and what

education value they will bring.

When ET visited, the schoolchildren were busily making wearable gadgets with their micro:bits, and other projects were on display such as an electronic guitar and a mini-basketball game. Haziqah, aged 14 had been on the bus twice, the second visit was on her own initiative to go on and try 3D printing, which she found intriguing, she said. She liked trying new things and had gone on to select web development as one of her co-curriculur activities. She was motivated to learn to help people: "I'd like to be a pilot, or a lecturer. [We] get to see the recent technologies and how to use and implement something new and better to improve the lives of people and the environment."

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Digitally smart

Darren, aged 13, had been experimenting with the Digital Makers micro:bits. After school he played educational games, but in the holidays he was able to game for fun. When it came to learning though, he strongly preferred paper-based education. Do you use tech much in the classroom? "In the past, no, but recently we have been integrating iPads now, one each, in some lessons. Some teachers still prefer the conventional methods. If we use iPads we can easily lose the notes."

It was Darren's first time on the bus. He found it very interesting, he said, and he felt that, as we move into a more modern world, we need to get used to all the new technologies. He wants to be a scientist in later life and wanted to know more about digital: "Especially coding, because creating helps other people. I'd like to help and contribute."

Both students were motivated by trying something new but also the idea of using tech to help their fellow citizens. This sense of the common good will surely be great news for the government of Singapore and its comprehensive plans to achieve its digital vision which are already making headway. Technology has already become a more attractive student pathway. The competitiveness of Computer Science has been rising at HE level, with more women choosing these courses at Singapore's universities. With innovative schemes such as Digital Makers, Labs on Wheels and Coding for Fun attracting pupils to coding, robotics and AI the government has made a smart choice in its journey to become a Smart Nation.

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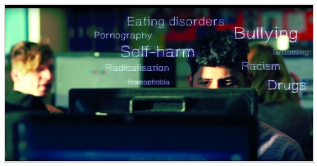

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