Digital Maker Programme with Micro:bits in Singapore

Background

On 13 April 2017, the Info-communications Media Development Authority (IMDA) launched the Digital Maker Programme (DMP) in Singapore with 100,000 micro:bits for schools and the larger community, following the BBC’s official launch across UK as part of their ‘Make It Digital’ initiative to increase digital skills among young people. Officiating the launch, Dr Yaacob Ibrahim, Minister for Communications and Information, highlighted the need for Singapore citizens to reap the benefits of technology and harness it to solve problems creatively and that the DMP would be an important initiative to encourage Singapore citizens to have a curious mind and passion to tinker and create with technology.

As Singapore advances towards being a fully-fledged Smart Nation with the goal of making effective use of technology to enhance daily life, IMDA recognises that it is not enough for Singapore citizens to know how to use and understand digital content and technology. The DMP supports the Smart Nation vision as it aims to nurture a new generation of digital natives who are empowered to create with technology, so as to cultivate real-world problem solving, encourage digital creativity and innovation, as well as foster collaboration and co-creation with fellow digital makers.

Digital Making in Schools

The DMP introduces coding and digital making to all Singapore public schools by providing primary and secondary schools with 300 to 400 micro:bits (per school) to enable fun and hands-on learning across all
subjects. Students at participating schools are encouraged to code, experiment and solve real-world problems using the micro:bits and in the process build up their confidence and creativity.

IMDA is of the view that school ownership of the programme and professional development for teachers are critical components for the DMP to be successful and impactful in the schools. To this end, IMDA worked with the Ministry of Education to invite schools to enrol in the DMP. To demonstrate ownership and commitment, school Principals are required to sign and submit the application forms to join the DMP and each school is required to nominate 5 teachers to attend a 1.5-day Educators Workshop curated and designed by IMDA and sponsored by Microsoft (Singapore).

At the Educators Workshop, instructions were scaffolded to support teachers from all background with different teaching subjects such as Art, Music, Physical Education, Geography and Language Arts (beyond the STEM subjects). Teachers learned basic coding on the micro:bit as well as how the micro:bit could be connected to sensors, motors and other devices. The workshop culminated in a group project where teachers designed, developed and make a prototype project with the micro:bit, related to their teaching subjects.

As school project deliverable for the DMP, IMDA kept it simple and meaningful by only requiring each school to submit one innovative lesson plan on how they integrated the micro:bits into a selected subject of their choice and to share how their students have coded and used the micro:bits in the school. IMDA will collect and collate these rich lesson ideas and resources and share them with all schools in Singapore. IMDA will also work with the Micro:bit Education Foundation to make the resources available internationally.

To date, 143 schools (40% of all primary and secondary schools in Singapore) have signed up for the DMP, with the programme reaching and benefiting 30,000 students. More than 600 teachers have completed their training at the Educator Workshop as they start to integrate digital maker ideas within their subjects. Many schools in the DMP have also set up makerspaces to provide a conducive physical environment to encourage their students to code and develop maker projects.

At the recent EduTech Asia 2017 conference held in Singapore on 8 and 9 November 2017, Singapore students proudly shared their Digital Maker micro:bit projects with local and overseas conference participants.
Nan Chiau Primary School students built their very own bowling pins tracker, displaying pins still standing or have fallen, allowing for more convenient score tracking.

Raffles Girls’ Primary School students demonstrated their improved traffic light system that can warn the blind, deaf and those engrossed on their mobile devices to the traffic lights.

Geylang Methodist School (Secondary) students developed a 2-in-1 wearable - GEMS Smart Card that can be used for class attendance taking and managing their storage lockers.

Pei Hwa Secondary School students created solutions to solve some real-world problems. They created a Panic Button which will alert the caretaker when the patient needs help or when the patient suffers a fall.

**Parent-Child Digital Maker Workshops in Schools**

A testimony of the early success of the DMP was how schools have extended what the students have learnt beyond the classrooms to their parents. At the request of the schools, IMDA recently provided additional support to schools that made plans to hold parent-child Digital Maker workshops.

At these workshops, it was observed that students, who have already learned how to code, served as a guide to teach their parents how to code the micro:bit. Parents and their children bonded and worked together as a family to make and assemble their digital maker projects. Through these parent-child workshops, the parents had the opportunity to understand and appreciate what their children were learning in school and IMDA hope that they will continue to explore coding and making projects together at home thereafter.
Building Digital Makers in the Community

With the objective to reach out to a wider audience in the community beyond schools, IMDA offered introductory Digital Maker workshops for members of the public in locations such as community libraries, citizen community centres as well as the Singapore Science Centre. Not-for-Profit organisations like the Centre for Fathering has also incorporated digital making in their father-child activities to promote family bonding.

On 8 July 2017, IMDA established the first Digital Garage at the Tanjong Pagar Community Club (TPCC). The Digital Garage provided the makerspace facilities and equipment for residents living in the vicinity to pick up basic coding skills and design their maker projects. Since the launch of the Digital Garage, community volunteers from TPCC have come forward to run Digital Maker workshops for participants across all age groups.

You can find out more about the IMDA Digital Maker Programme at:
Facebook: www.facebook.com/DigitalMakerSG
Instagram: www.instagram.com/digitalmakersg
Website: www.digitalmaker.sg