Digital Maker Programme in Singapore

Challenge
Kids and adults today are extremely tech savvy, but most of their interaction with technology is one of consumption. As Singapore advances towards being a fully-fledged Smart Nation with the goal of making effective use of technology to enhance daily life, Inforcomm Media Development Authority (IMDA) recognises that it is not enough for Singapore citizens to know how to use and understand digital content and technology.

Solution
IMDA Digital Maker programme 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. The programme introduces simple-to-use and open-ended technology that students and adults will find comfortable to use, known as the micro:bit. Through this micro-controller, everyone has the opportunity to explore the possibilities of digital making.

1) Digital Making in Schools
The programme calls out to all primary and secondary schools to sign up, where they are given micro:bits for up to one level of students, approximately 200 to 300 micro:bits per school. Schools can determine which level(s) they want to introduce the micro:bits to (e.g. for a specific level or rotate across levels each term) and how they want to use it (e.g. for their Design and Technology lessons). Through a 1.5-day Educators Workshop provided by Microsoft through trainers like Micromaker Asia, Tinker Tanker and Zenitant, teachers learn basic coding on micro:bit, connecting with various sensors, as well as making a project related to their subjects. One of the key focus of the workshop is relating the use of micro:bits to how they can be applied in various subjects, and not just about learning how to code.

2) Building Digital Maker communities
With the aim to reach out to adults, the Digital Maker programme also offers introductory digital making workshops held in the community for everyone to have an opportunity to create with technology. Working with various community partners like National Library Board, SkillsFuture Singapore and self-help groups, 2-hour Digital Maker workshops are made available to members of the public.

Learning Impact Outcomes
Within a short span of 9 months, 142 schools (40% of all primary and secondary schools) have signed up for the Digital Maker programme, reaching more than 30,000 students. More than 500 teachers have been trained and they are teachers in subjects ranging from Maths and Science, to Art and languages. Some schools even set up a maker space to encourage their students to explore various technologies, for example, Montfort Junior School and Institute of Technical Education (ITE).

From the first batch of 70 schools who signed up, more than half the schools have not introduced coding and making into their school programme previously. Now these schools have incorporated digital making into various subjects like Science, Maths, Art, Design & Technology, as well as in Project Work and Environmental Education. One school brought their students to a hospice to understand the problems faced by the patients. The students then developed various devices to help the patients, e.g. a fall detection device to alert the care giver when the patient falls, a handheld buzzing device to inform the elderly who are hard of hearing when the doorbell rings. These activities help to develop students' real-world problem solving skills, foster collaboration and co-creation, and cultivates digital creativity and innovation.

Over 100 workshops have been run in the community, reaching 5,000 members of the public, including students, adults and seniors. 95% of the workshop participants agreed that the introductory workshops help them understand some basic programming, and 96% are keen to attend other workshops on coding and making.

Return on Investment
To-date, the programme rolled out since April 2017 has benefited more than 35,000 students and adults with the potential to reach more in the coming years.