

Digital inventions by children help others ride out the Covid-19 pandemic

Learning never stops, and the pandemic is providing an opportunity for students to practise digital creativity and fight the coronavirus with their inventions

Children are proudly demonstrating their ability to adapt to the challenges of the Covid-19 pandemic by utilising one of the most essential skills of the 21st century – computational thinking.

Computational thinking is a problem-solving process that can be applied to everyday situations. It sees complex problems dissected using a skill set of decomposition, pattern recognition, pattern abstraction and algorithmic thinking, with possible solutions devised and presented in a manner that can be understood by both humans and computers.

"Computational thinking is the thought process required to write good codes," says Daniel Lai, Programme Director of CoolThink@JC, a computational thinking scheme created and funded by The Hong Kong Jockey Club Charities Trust. "It trains learners to think like computer scientists, who can demonstrate abilities such as logical thinking and problem-solving, and disaggregate complex problems into smaller, solvable parts."



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The programme, aimed at upper primary school students, targets the creation of technological inventions to help solve community problems. These inventions are showcased at the annual CoolThink@JC Competition, which over the last two years has featured ideas inspired by the challenges of the pandemic.

One such highlight was a smart home device that won first prize in the App Inventor category in 2020. The invention required technical knowledge in areas such as mechanical assembly, hardware control and coding, and took almost three months to complete.



The CoolThink@JC Competition winners from Chan Sui Ki (La Salle) Primary School developed a smart home app to remind family members to conduct disinfectant procedures.

It was created by students from Chan Sui Ki (La Salle) Primary School, and reminds family members to conduct disinfectant procedures on arrival at home.

The students' teacher-adviser, Anthony Wong Chi-hung, says: "Their resourcefulness and problem-solving skills were on full display. Their self-learning capabilities exceeded our expectations."

Another invention that garnered attention was an auto-flushing device made by students from King's College Old Boys' Association Primary School No 2, who were concerned about public restroom hygiene.

The device can auto-flush toilets once the lid is lowered, by sensing overall light levels. It also uses an ultrasonic sensor to collect data about the usage rates of different bathroom stalls, and then automatically flushes those toilets during peak times.



Another winning team, from King's College Old Boys' Association Primary School No 2, developed their auto-flushing device using Scratch, a programming tool for children.

Their teacher-adviser, Chan King-hong, says: "Many people are trying to get through tough times. I'm proud of my students' ability to transform good intentions into something that delivers social impact."

Also inspired by the pandemic was a social-distancing wristband developed by students from Marymount Primary School. It uses an ultrasound sensor to gauge the distance between the wearer and other people nearby, and alerts the user when social-distancing space is compromised.



Students from Marymount Primary School developed a social-distancing wristband for the competition that gauges the space between the wearer and other people.

The group's teacher-adviser, Tony Lam, says: "Every child can find joy in learning to code. It is a journey sometimes riddled with challenges, but it is also a meaningful process of self-discovery."

The CoolThink@JC scheme is designed to contribute to the development of computational thinking by empowering participants to become thinkers, with their inventions demonstrating problem-solving, creativity and a sense of social responsibility.

"It's hard to predict what the future holds for children, but ... a lot of knowledge learned at school may be outdated by the time they finish their education," Lai says. "Being able to think computationally, and thus problem-solve well, will give them a head start in life, and an edge over competitors amid uncertain times."



When it comes to computational thinking, one can and should start early. Experts have suggested that even Primary Four students are mature enough to start learning basic concepts of computational thinking, and practising with lightweight, visually-based programming tools.

Start inspiring digital creativity in children with CoolThink@JC, a computational thinking education programme created and funded by The Hong Kong Jockey Club Charities Trust.

Check out the CoolThink@JC articles in the *South China Morning Post* to #SuperCharge your thinking.