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Creative Computational Thinking: What's Coding got to do with it?

The Australian Government in their National Innovation and Science Agenda Statement proposed a series of reforms to encourage entrepreneurship and innovation. It seeks to encourage students to take up training in STEM and in particular, how to code. The trend is consistent with a world-wide movement towards coding, finding applications in the development of computer apps, 3D printing, robotics, drones and using low-cost computers such as Raspberry Pi.

Increasingly, this focus on coding is linked to an appreciation for the importance of young people to be creative in enacting STEM. The OECD recently stipulated that creative thinking involves students: generating diverse ideas, generating novel ideas and evaluating and improving these ideas in a purposeful and iterative way. Through coding, students are provided with opportunities to be creative in these ways which are applicable to real-world problems.

The UK and parts of Europe have developed coding curricula at primary and secondary school levels. In Australia, the development of similar curricula is underway and creativity has been acknowledged as a general capability in the Australian Curriculum. This call for a greater number of people who can code isn't necessarily about producing more programmers, but for a need of computer-savvy workers and citizens, who can do more than use PowerPoint or Word. Rather, it is a call for people who can work creatively with data at a number of different levels across fields such as science, mathematics, economics and the humanities, as well as in their everyday lives. These levels include breaking down data; observing trends and patterns in data; identifying the general principles that underlie the data; communicating the relevant aspects of the data; and developing methods that solve or process the data. People who are able to work with data in this way are said to be engaging in computational thinking, and if they do in a creative way then it is creative computational thinking.

This workshop is designed to provide participants with a greater understanding of what is meant by creative computational thinking by working through a series of activities to demonstrate what it is, how computational thinking can be done without a computer in creative ways, and how computational thinking can be applied to robotics. Applications of computational thinking will also be related to the Digital Technologies curriculum.